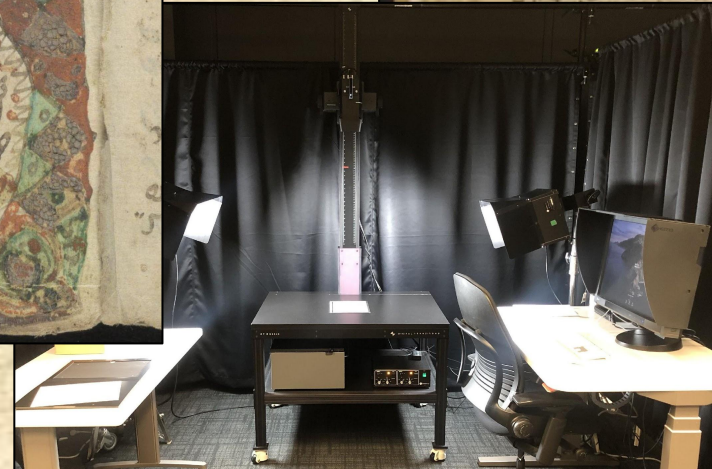
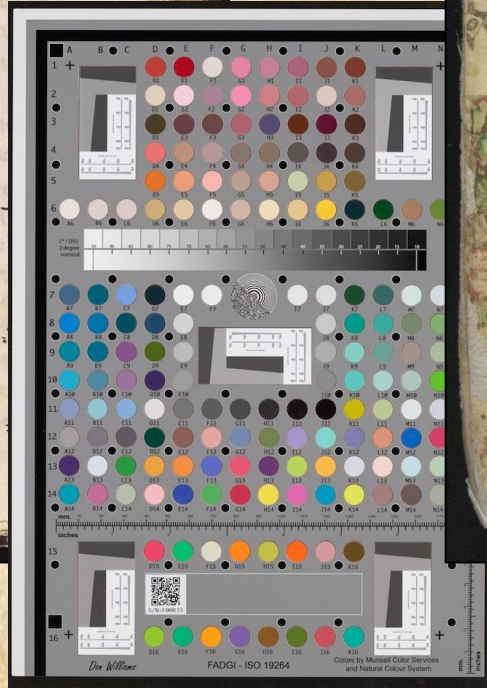
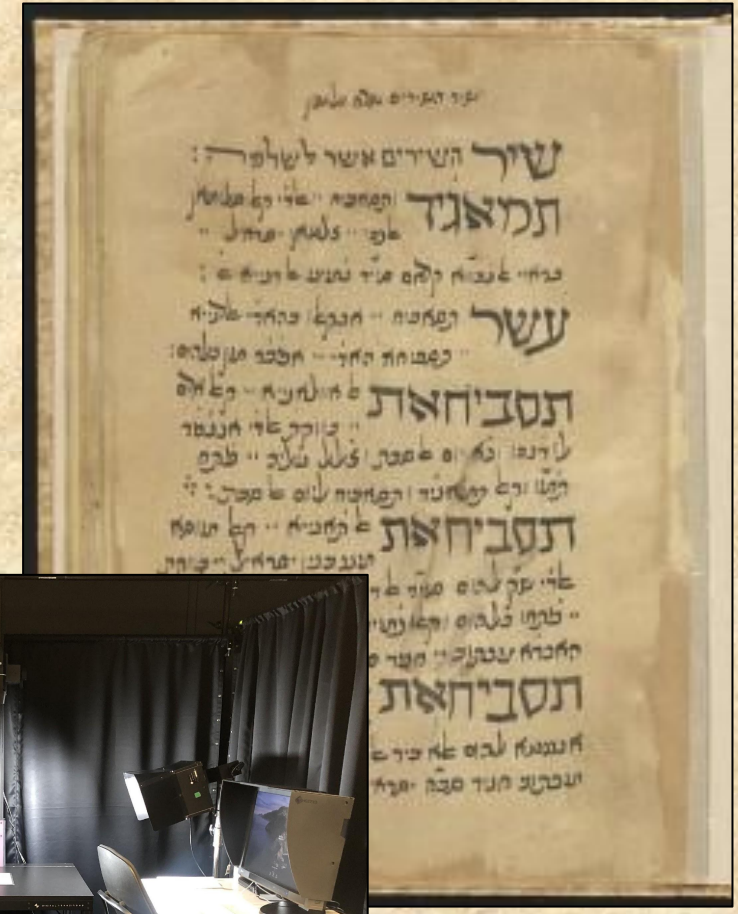


Digitizing the Library of Congress Hebrew Manuscripts Collection

<https://www.loc.gov/collections/hebraic-manuscripts/about-this-collection/>



Ariel Segal, Library of Congress Israel and Judaica Section



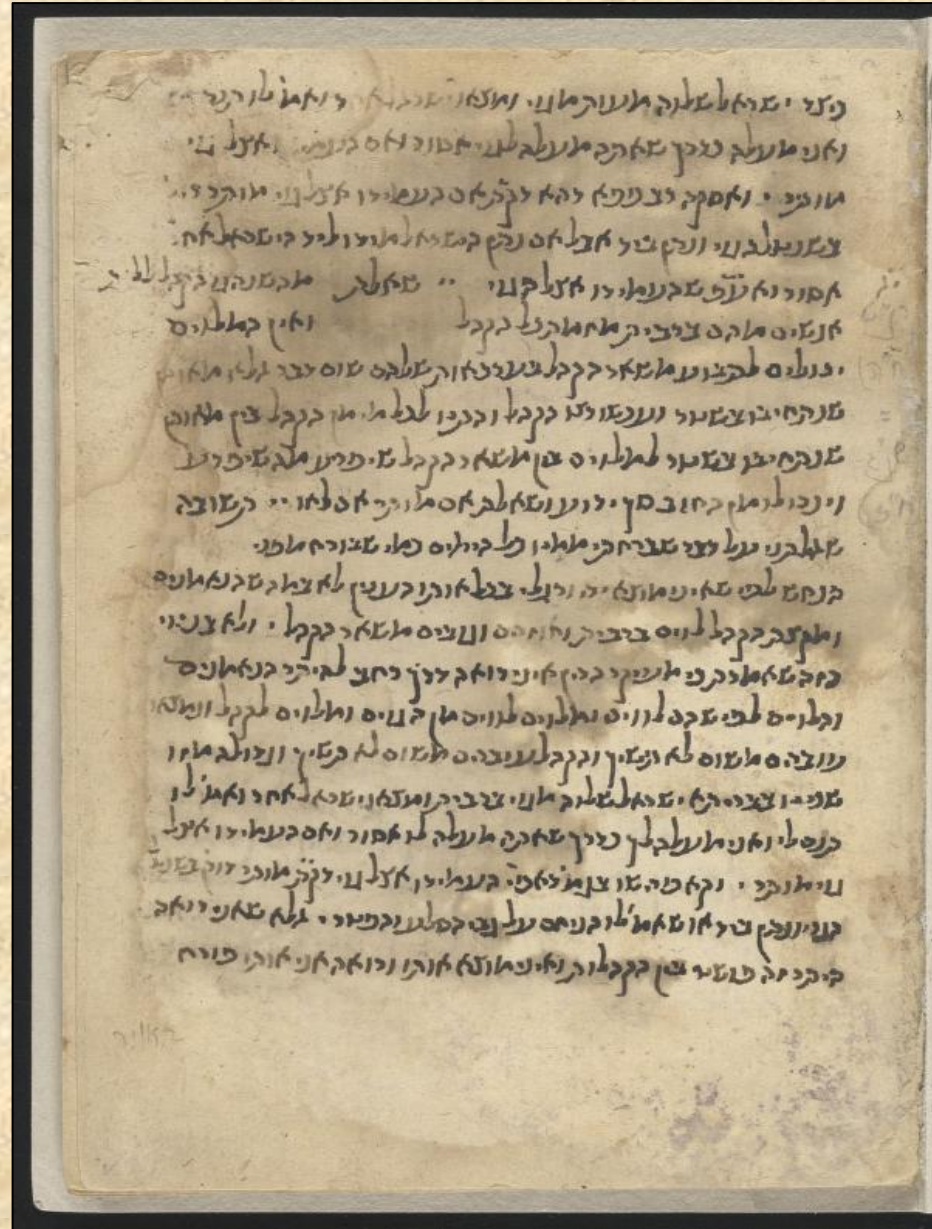
LOC's Collection of Hebrew Manuscripts: Origins

- The Banker and the Book Collector: Jacob Schiff and Ephraim Deinard.
- Several deposits during the 1910s.
- Detailed descriptions made by two former heads of the Library's Hebraic Section accompanying each item in collection.
- Collection microfilmed in 2000s, imaged at relatively low resolution in 2015.
- Significant acquisitions continue to the present, e.g. MSS 229 & 245.



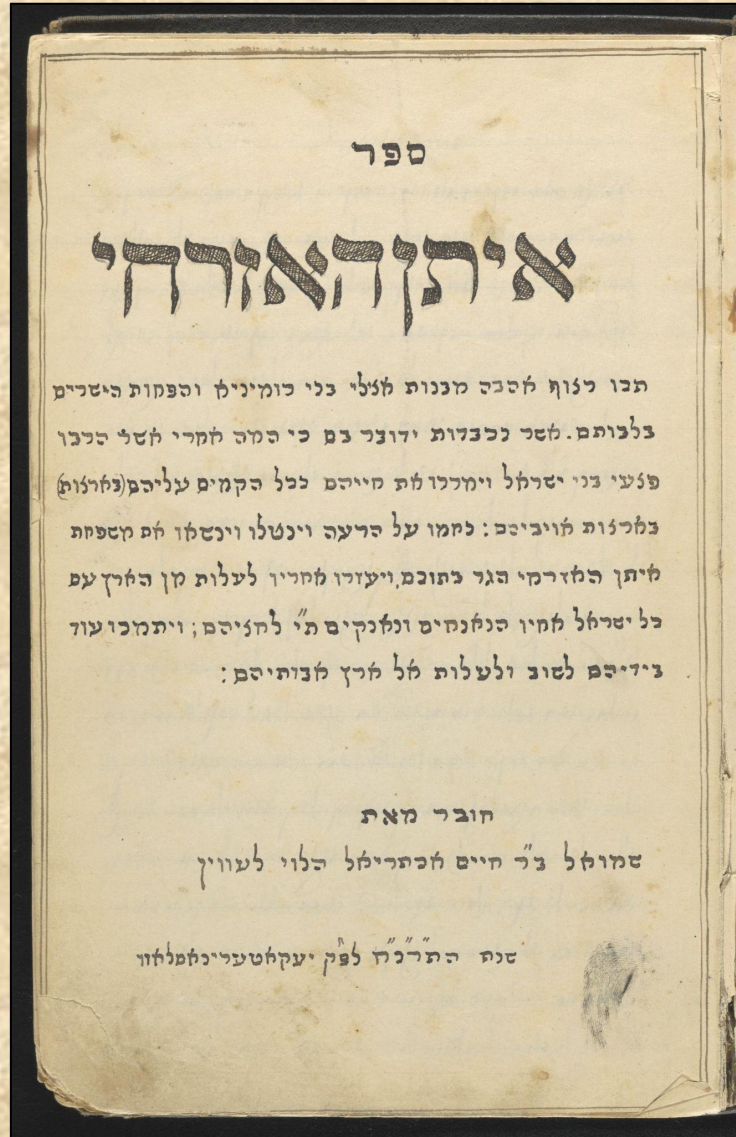
Page from MS 181, Washington Haggadah, depicting cleaning out leaven before Passover. 15th century.

The Rashba Manuscript



MS 157, a 14th century collection of responsa from Rabbi Solomon ibn Adret, The "Rashba"

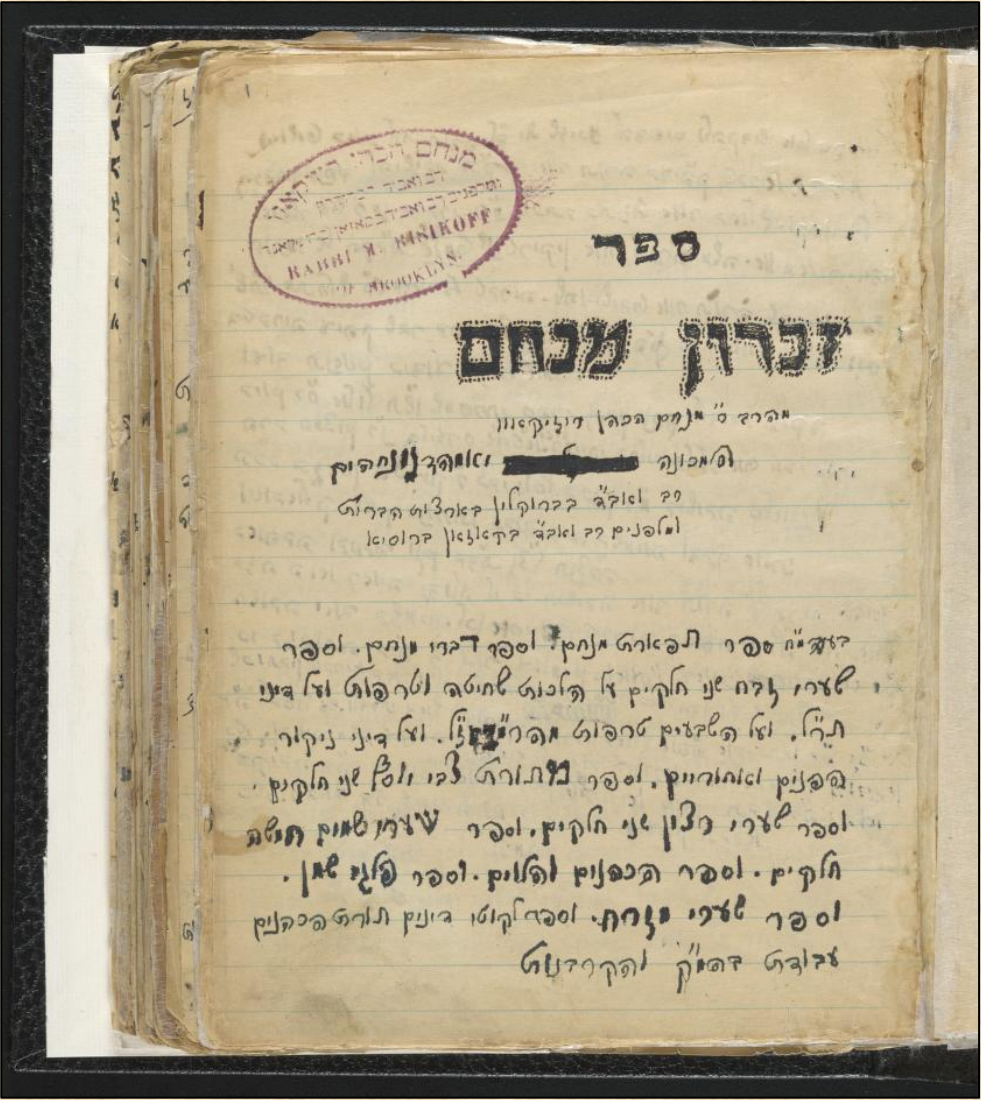
Hebrew Novel with Jefferson Airplane Connection



<https://jormakaukonen.com/blog/2015/jahrzeit-for-my-mother/>

MS 77 Sefer Eitan ha-Ezrahi, by Samuel b. Hayyim Acatriel ha-Levi Levine, donated by his son Benjamin Samuel Levine. 1897-8.

Personal and Naval Connection



MS 224, Sefer Zikhron Menahem, Rabbi Menahem Risikoff, 20th century

Donor: Rabbi Chaplain Arnold Resnicoff

Digitization Project Approach

- LOC partnered with David Berg Foundation, which provided funding.
- Agreement between Foundation and LOC:
 - Specified that manuscripts needed to be online by May 2023 for Jewish American History Month.
- Digital Scan Center at Library had been updated during pandemic with new equipment- now Digital Imaging Lab.
- Feasibility assessment: Coordination among AMED Hebraic Section, Digitization Services Section, Conservation Division, Office of General Counsel.
- Project followed LOC's Digital Collections Access Workflow for special collections projects.



Page from MS 229 "Order of Prayers before Retiring at Night" showing blessings for great Jewish and secular scholars

Digitization Workflow

- Manuscripts were received from the Hebraic Section in sets for digitization.
- Digitization team selected the best imaging/capture device for each manuscript based on its physical characteristics and condition.
- Digitization workflow included image capture, post-processing, and quality review.
- Images were put into our repository systems for final quality review by Hebraic Section specialists.
- The loc.gov team worked to align images with the metadata needed to present them online.



MS 69 Bakashot, piyyutim (liturgical poems) and prayers, mainly from poets from the Maghreb, some from Algeria. 18th century

Workflow Management

Title	LCCN	Recommended Imaging	Actual Image Count	Imaging - Staff, Date, Device	Imaging Time (Hours)	Post-Processing Staff and Date	Post-Processing Time (Hours)	QR Staff and Date	QR Time (Hours)	Golden Convert Staff and Date	Metadata Scripts Staff and Date	PDF Creation Staff and Date	Bagging Staff and Date	Delivery to CTS Staff and Date
LC Hebr. Ms 223; Prayers for various occasions; 132 scans (6.5 x10 cm)	2018757841	180	148	CJP 10/20/22, dsc03 Delivered; Ariel shot 1 folio 11/22/22	1.25	CJP 10/24/22		CJP 10/25/22		CJP 10/25/22 [Ariel did 1 folio 11/22/22]	CJP 10/25/22 [Ariel redid 11/22/22]	N/A	CJP 10/26/22 [Ariel redid 11/22/22]	Accepted
LC Hebr. Ms 224; Sefer Zikhron Menahem Risikoff; 326 scans (21.5 x16.5 cm)	2018757842	180	354	Ariel, 10/26-27,31/22; 11/1-3 & 7/22 dsc03 & 04	6	Ariel, 11/2-4/22	3	Ariel, 11/4/22 IMAGES 0234 & 0236 slightly out of focus. Shoot folio 83 (0186-0187) & 151 (0334-0335). Reshot all these on 11/7	2	Ariel, 11/3 & 7/22	Ariel, 11/7/22	N/A	Ariel, 11/7/22	Accepted
LC Hebr. Ms 226a; Sefer Meorot Natan arranged by Nathan Spira; 454 scans (20 x914.5 cm)	2018757844v01	180	468	Sarah 10/20/22 dsc03	2	Sarah 10/24/22	1.5	Sarah 10/25/22	0.5	Sarah 10/24/22	Sarah 10/25/22	Hana 12/12/2022	Hana 12/12/2022	Accepted
LC Hebr. Ms 226b; Sefer Meorot Natan arranged by Nathan Spira; 128 scans (24 x15 cm)	2018757844v02	180	492	Jade 10/21/22 dsc03	3	Jade 10/21 & 24/22	2	Jade 10/21 & 24/22	1	Jade 10/24/22	Jade 10/24/22; [Ariel 11/3/22]	N/A	Ariel, 11/3/22	Accepted
LC Hebr. Ms 230; Haggadah shel Pesah; 22 scans (16.5 x 11.5 cm)	2022397713	180	57	Matt 10/25/22 dsc04	0.5	Matt 10/25/22	0.25	Matt 10/25/22	0.25	Matt 10/26/22	Ariel 10/26/22	N/A	Ariel 10/27/22	Accepted

Challenges: Timeframe, Construction, Other Priorities

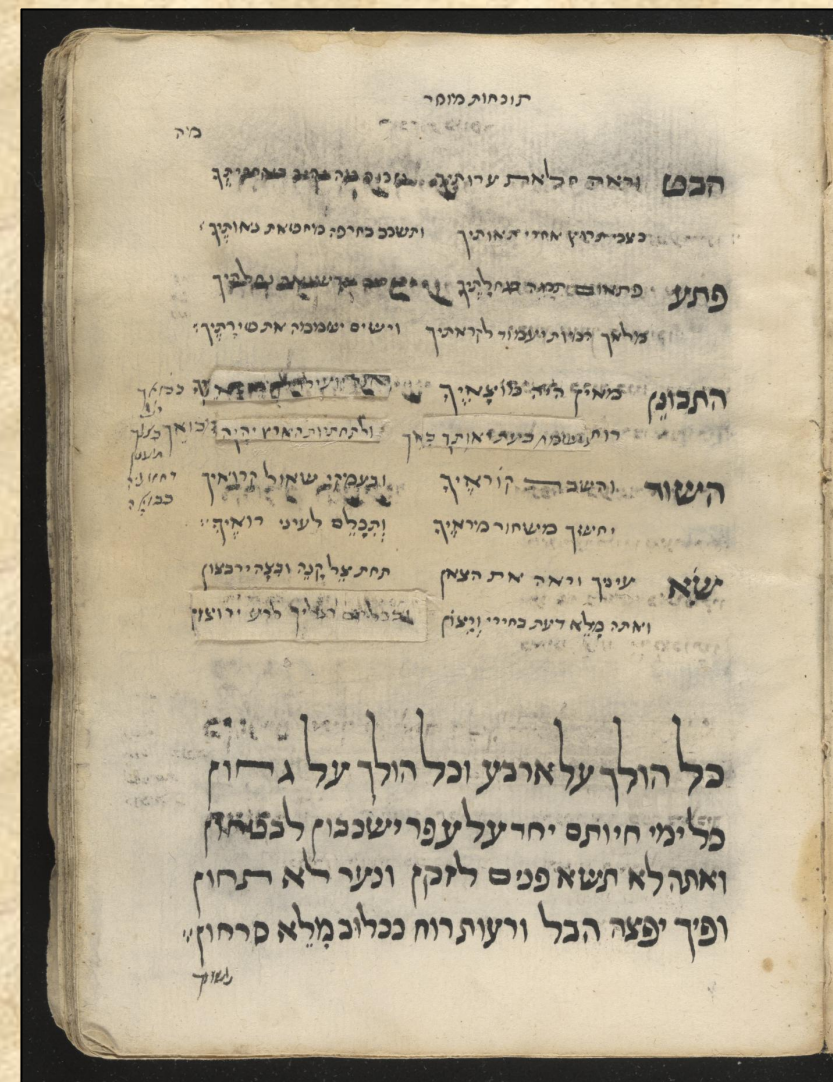
- Digitization began in December 2021.
- Construction to address temperature control: 1 year, starting Spring 2022; Reduced capacity in DIL.
- 2 other short deadline projects in Spring/Summer 2022 **also** planned in agreement with external organizations.
- Project manager (Hana) & digital conversion technician (Ariel) carried forward lessons learned from these projects.
- Capture devices/software trouble
- Lack of documentation
- Fall 2022: 3 Digital Imaging specialists hired; introduce efficiencies; more DIL staff available.



Library of Congress Digital Imaging Lab

Challenges in Collection Material

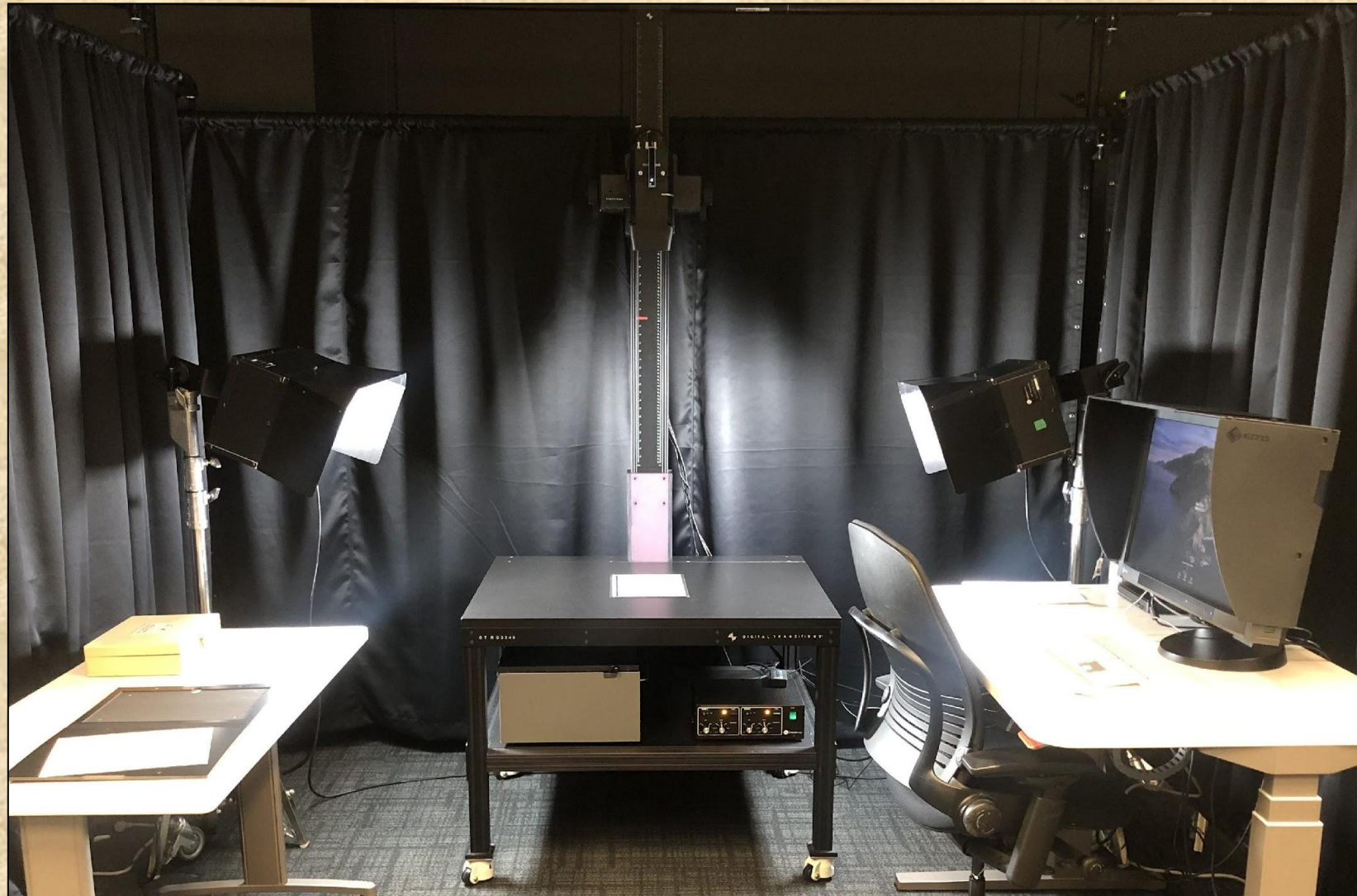
- Complex nature of individual manuscripts required consultation with staff in AMED Hebraic Section & Conservation Division.
- Manuscripts with iron-gall ink/cracks needed further treatment prior to imaging.
- One manuscript had powdery substance, confirmed by CD to be toxic lead arsenate (!); Had to be handled by CD while DIL staff **carefully** imaged.
- Conservation treatment not always accomplished in steady, rolling cadence as planned due to competing priorities.
- Manuscripts had page numerals in Hebrew letters corresponding to # folia: Ex: Heb. aleph1= א, bet 2= ב.....
- Ariel, fluent in Hebrew, would ensure text was in order.
- MS 2 “Tokhehot Mussar” had many subtle text hinges under which alternative readings were present.



MS 2, “Tokhehot Mussar,” leaf showing paste-on insertions of Hebrew text, hinged to allow for observation of alternate text underneath

Imaging Techniques: Equipment

- All manuscripts were imaged on similar stations in the Library's Digital Imaging Lab.
- Camera position is adjusted on the column based on the item size and resolution needed.
- Camera stations also include high-quality lights for ideal illumination.



Capture station in Library of Congress Digital Imaging Lab

Targets and the “Golden Convert” Process

- Imaging targets used for device calibration.
- Improved color accuracy of the digitized manuscripts, bringing the images both quantitatively and qualitatively closer to the original objects.
- Software “reads” target patches and creates a color profile specific to the target & imaging session where calibration image was produced.
- Program applies custom color profile to TIFFs from session and “converts” them to produce new, color-corrected TIFFs.
- Improvements in quantitative, objective image quality evaluation parameters.



Imaging Target

Image Quality Improvements: Quantitative

Distortion		Summary		QR:F00125		Adobe RGB (1998)-Embedded			
<input type="checkbox"/> Show Details?		Colorimetric		Generate Color Profile					
Measurement	4	3	2	1	F	Pass Fail	Lower Limit	Value	Upper Limit
Lightness	25% ****		69% ***						6%
Delta E(a*b*)	62% ****							38% ***	
Uniformity	100% ****								
Color - Delta E 2000	33% ****		67% ***						
Color - Registration	100% ****								
Sampling Frequency	100% ****								
Sampling Efficiency & Nyquist	95% ****								5%
50% SFR	100% ****								
L* Noise	100% ****								
Geometric Distortion	Under Construction								
Color Distortion	Under Construction								
78.1% 4 Star Compliant									

Distortion		Summary		QR:F00125		Adobe RGB (1998)-Embedded			
<input type="checkbox"/> Show Details?		Colorimetric		Generate Color Profile					
Measurement	4	3	2	1	F	Pass Fail	Lower Limit	Value	Upper Limit
Lightness	100% ****								
Delta E(a*b*)	100% ****								
Uniformity	100% ****								
Color - Delta E 2000	100% ****								
Color - Registration	97% ****								
Sampling Frequency	100% ****								
Sampling Efficiency & Nyquist	95% ****								5%
50% SFR	100% ****								
L* Noise	100% ****								
Geometric Distortion	Under Construction								
Color Distortion	Under Construction								
94.2% 4 Star Compliant									

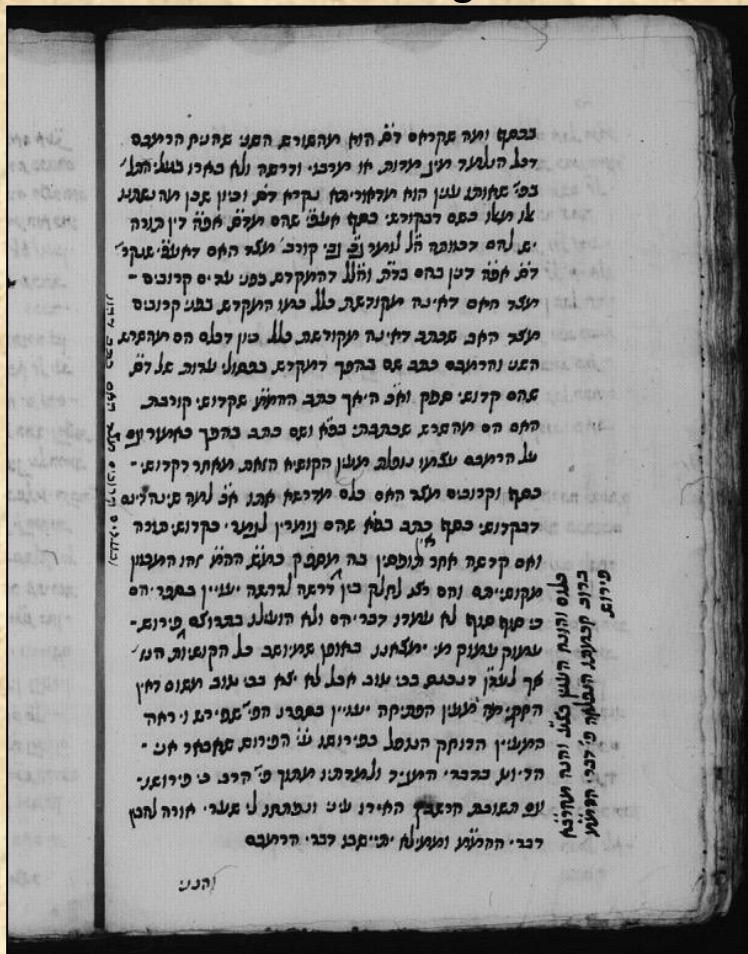
Evaluation Parameter Values Before Golden Convert

Evaluation Parameter Values After Golden Convert

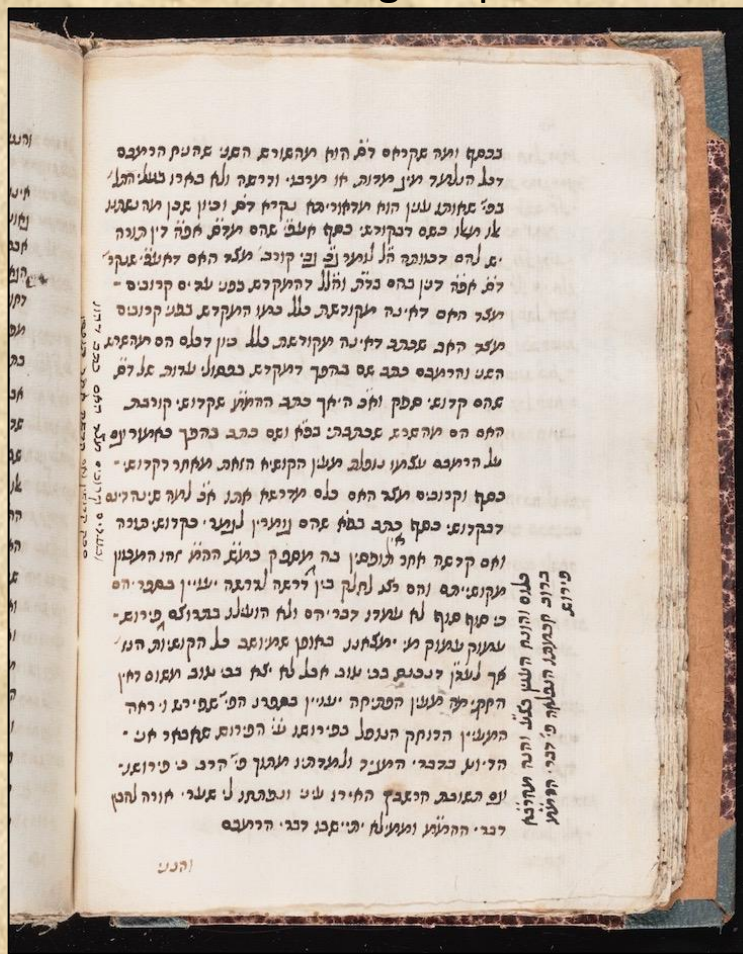
Image Quality Improvements: Qualitative!

- MS 31, "Responsum on the validity of the kiddushin (betrothal) of two daughters..." 17th century. leaf 26r

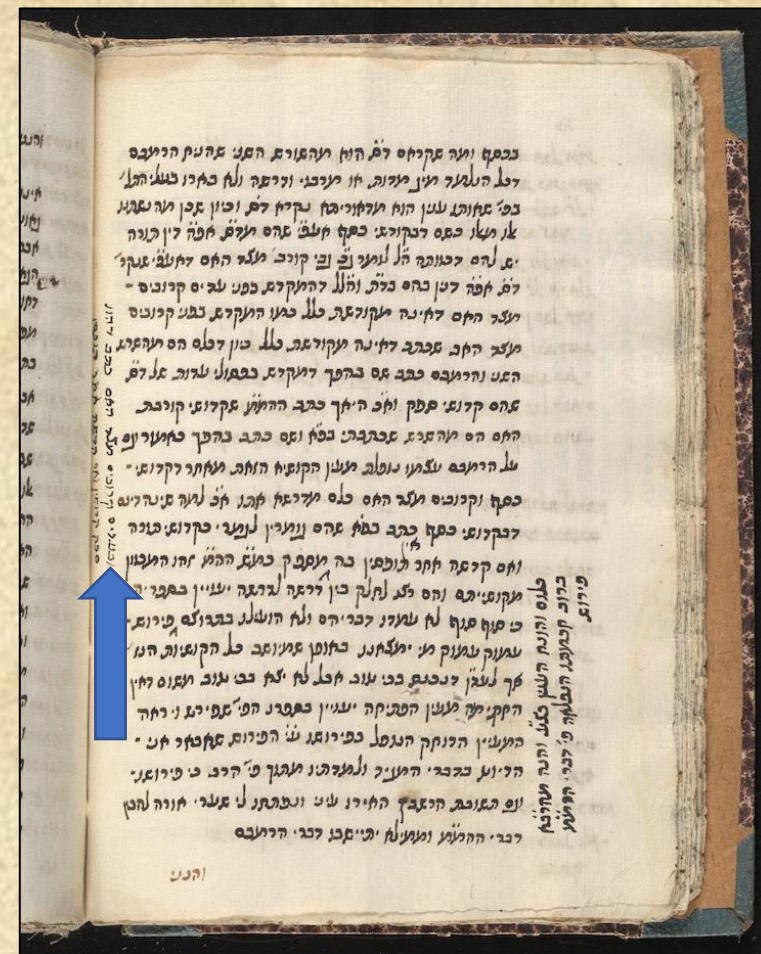
Older microfilm digitization



Initial image capture



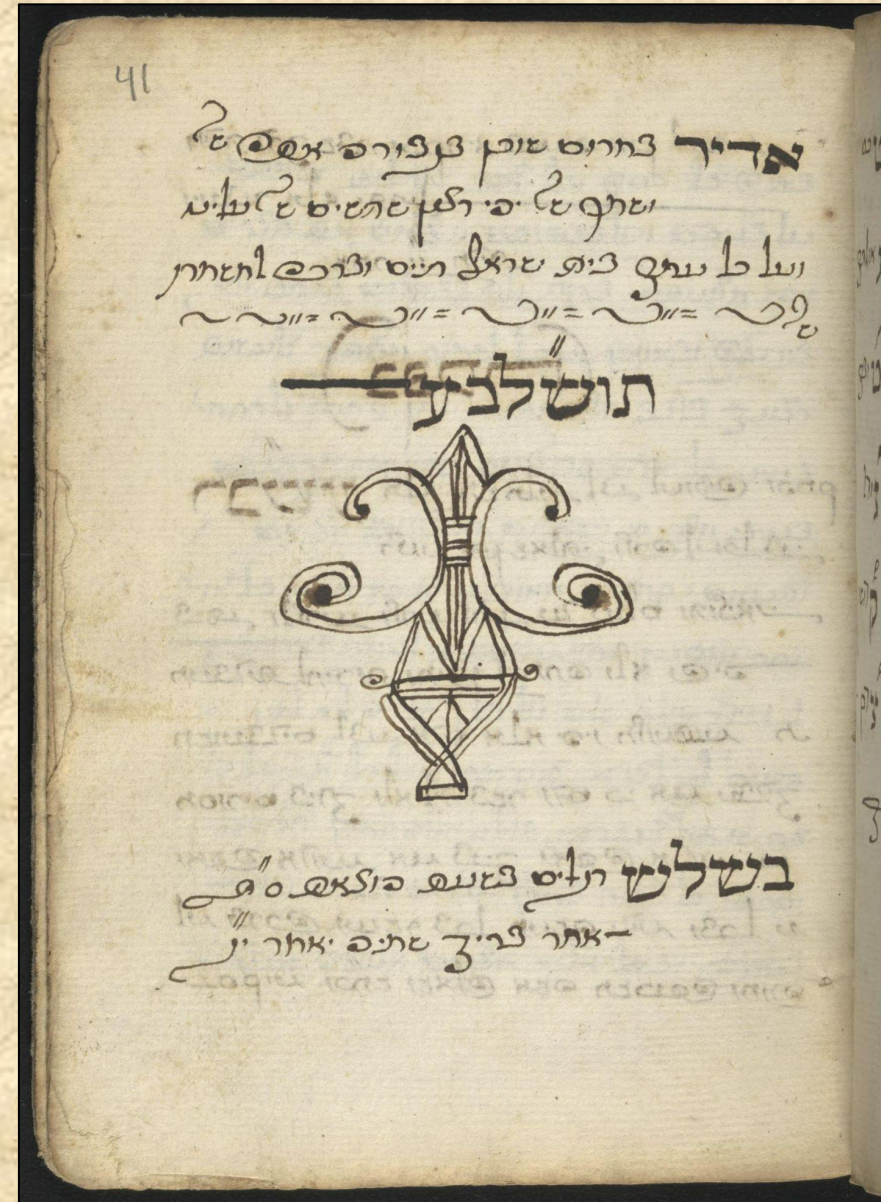
After Golden Convert



Note exposure of previously unseen autograph gloss by R. Moses Benveniste including Hebrew "safek kiddushin" (doubtful betrothal).

Results

- Digitization, processing, and web presentation were all finished prior to Jewish American Heritage Month 2023 per agreement with Berg Foundation.
- Collection's release was noted by LOC in August 2023 press release.
- Interest generated: news articles in American and Israeli press, cultural heritage institutions.
- LOC blog post about the artist Joseph ben Meir Schmalkalden, creator of 18th century "Order of Prayers before Retiring at Night":
<https://blogs.loc.gov/international-collections/2020/11/portrait-of-the-artist-as-rainbow-maker-joseph-ben-meir-schmalkalden/>
- Lecture on Washington Haggadah on March 28, 2024 (delayed 4 years due to COVID!):
<https://youtu.be/etfH7gZUC6I?si=FJcUoWPonKyy5KP>



MS 104 Hoshanot for Hoshana Rabba according to the Sephardic rite.

Phase 2 Megillot, Ketubot...

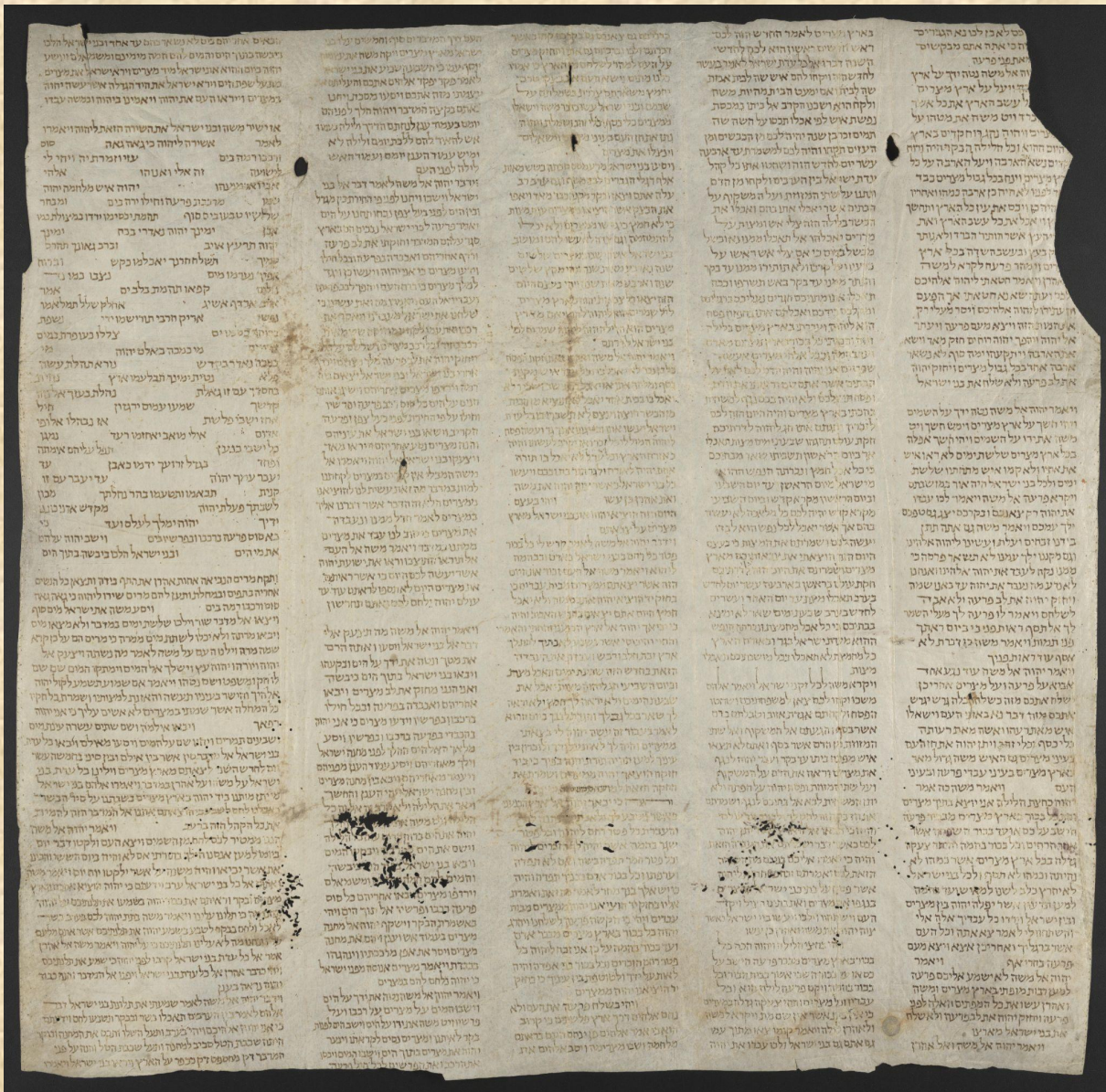


MS 238 Washington Scroll of Esther, 18th century



MS Ket. 1 Celebrating a wedding in Ancona, Italy, in 1722

1000 year old Torah scroll fragment



MS 245 Oriental Torah Scroll fragment, in Hebrew, containing Exodus 10:10-16:15 (10th/11th century)

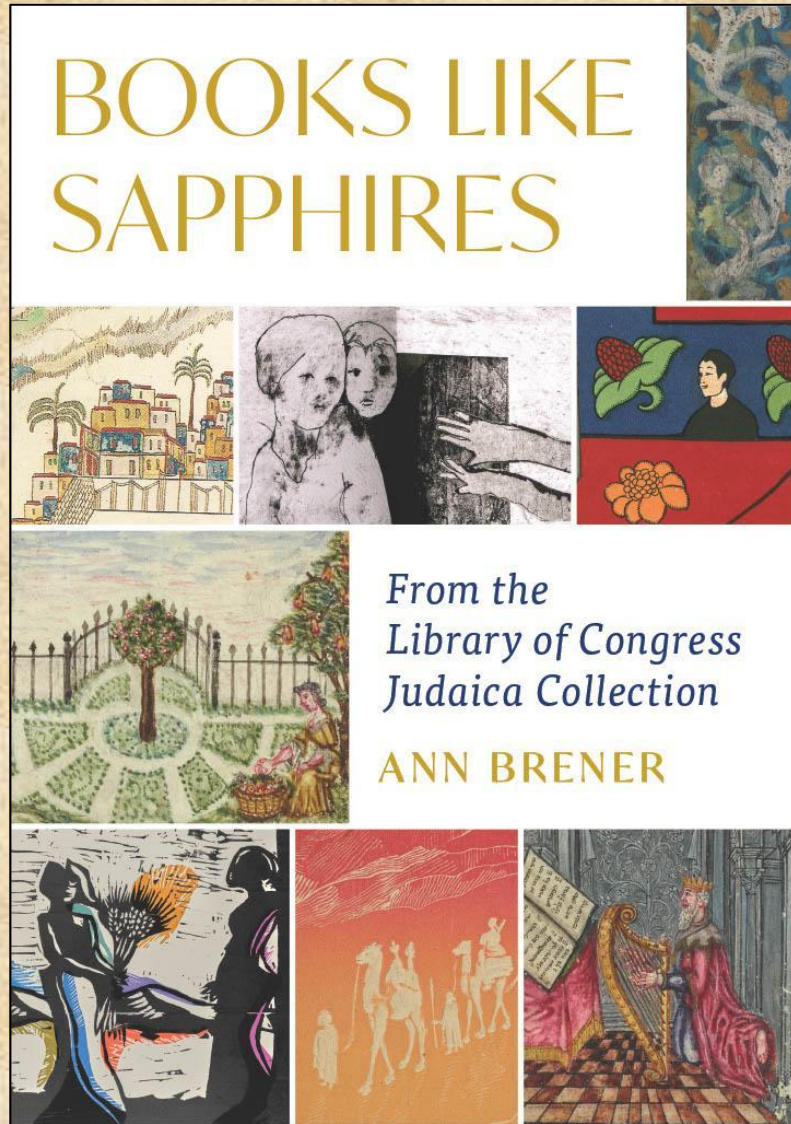
Future Directions

- Use lessons learned to digitize other LOC Hebraic Collections.
 - Incunabula (Early Hebrew printing before 1501)
 - 16th Century Hebrew Books
 - Hebrew Broadsides
- Project at Bar-Ilan University for using AI to develop OCR for Hebrew manuscripts.
- Now that LOC manuscripts are indexed in National Library of Israel's Ktiv database of Hebrew manuscripts, perhaps they can be used in the OCR project.

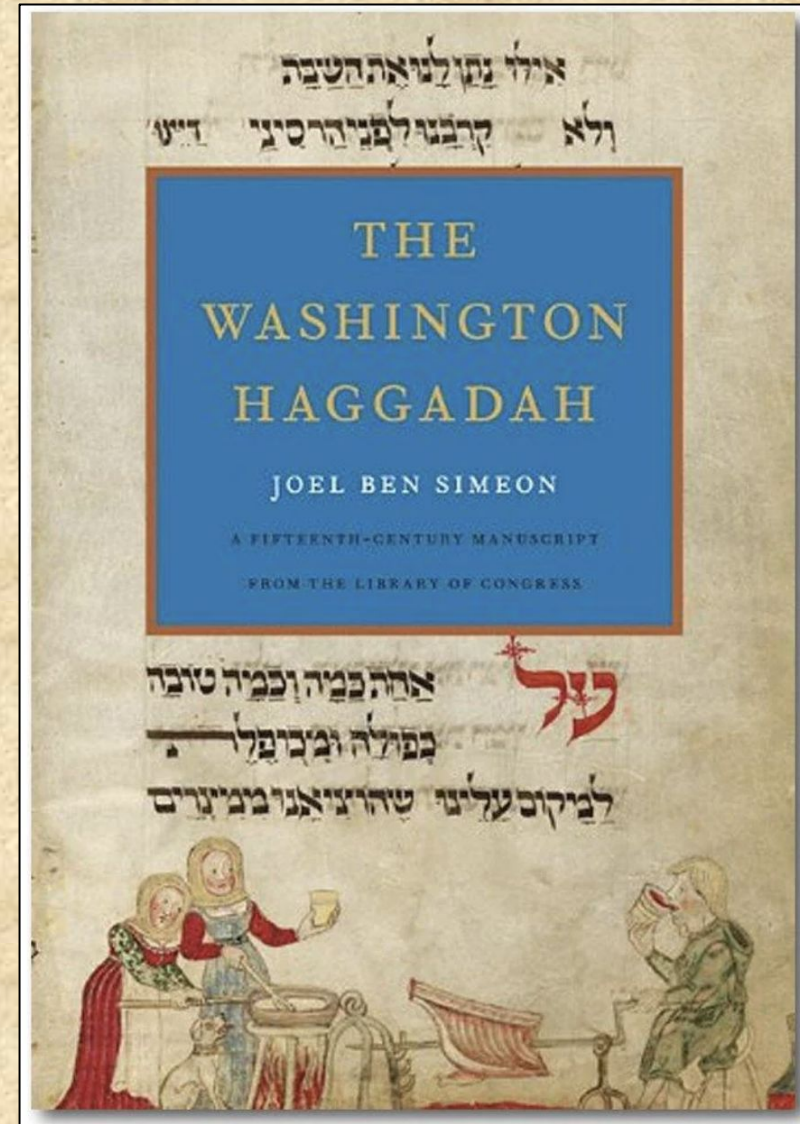


Low resolution sample page from incunabulum: Rabbi Solomon ibn Adret (Rashba) responsa (Rome, 1469-72).

Further Reading on Library of Congress Judaica



<https://brandeisuniversitypress.com/title/books-like-sapphires-from-the-library-of-congress-judaica-collection/>



<https://library-of-congress-shop.myshopify.com/products/washington-haggadah-1>

Thank You! Questions?



<https://www.loc.gov/collections/hebraic-manuscripts/about-this-collection/>
Folio from MS 229 "Order of Prayers before Retiring at Night" showing woman making blessing on rainbow, together with blessings on pleasant scents. 18th century.