



Milton Sondag Papers, 1962-2017

Finding aid prepared by Eva Labson

The Metropolitan Museum of Art
Antonio Ratti Textile Center and Reference Library
1000 Fifth Avenue
New York, NY, 10028

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Summary Information

Repository	Antonio Ratti Textile Center and Reference Library
Title	Milton Sunday Papers, 1962-2017
Dates	1962-2017
Extent	104.0 Linear feet 19 boxes
Language	English
Abstract	The Milton Sunday Archive contains the personal research notes and study materials of Milton Sunday. A renowned specialist and teacher in the field of textile studies he is known specifically for his work on woven and non-woven textile structures, techniques and continuous pattern. Researchers will have access to his notes, correspondence, study aids and teaching materials.

Preferred Citation

[Document/item name], [Box #, Folder #], Milton Sunday Papers, Antonio Ratti Textile Center, The Metropolitan Museum of Art

Biographical Note

Milton Sunday, regarded as one of the foremost experts in the field of textile studies, is known for his research and documentation of textile techniques, structures and continuous pattern. Sunday's introduction to the field came after he completed a BFA in painting at Carnegie Mellon University in 1962. Immediately upon graduation he was hired to assist the director of the Textile Museum in Washington, D.C., Alan Sawyer, who was working on a private collection of pre-Columbian ceramics. Sunday's project was to convert the images painted on the ceramic objects into 2-dimensional drawings as an integral part of the book: Sawyer, Alan R., et al. "Ancient Peruvian Ceramics: the Nathan Cummings Collection." (New York: Metropolitan Museum of Art, 1966).

Sunday's training in the field of textile studies at the Textile Museum was, as he describes it, better than a graduate degree program. He worked closely with Louisa Bellinger (Old World Textiles), Mary Elizabeth King (New World Textiles, including pre-Columbian), Irene Emery, whose seminal book, "The Primary Structures of Fabrics." (The Textile Museum, 1966) was not yet published, and Charles Ellis (independent carpet researcher).

Early duties included working with the Museum's staff photographer, an experience through which he developed a large visual catalog of the Textile Museum's collection. During the process he realized how important it was to look closely yet consider the whole, and recognized the value in extensive photographic documentation.

Appointed assistant curator in 1966, Sunday was charged with the Textile Museum's rug collection, and in 1967 he organized his first exhibition, East of Turkistan: an Exhibition of Chinese Rugs. Pulling together material that had never been exhibited before, this was a ground breaking show. In that same year he left the Textile Museum to assume the position of assistant curator of textiles at the Cooper Union Museum in New York (renamed the Cooper-Hewitt National Design Museum in 1968).

During this early period at the Cooper Union, Sunday began to work closely with Nobuko Kajitani at the Metropolitan Museum of Art. Kajitani had started at the Textile Museum before going to the Met to set up a laboratory specifically for textile conservation – the first of its kind for this museum. Together he and Kajitani examined woven silks under a microscope, and discussed what they observed. It was through this project that Sunday developed an interest in drawloom silk weaving, which would inform much of his later work. Building on these discussions, in 1968 Sunday and Kajitani participated in the CIETA (Centre International d'Étude des Textiles Anciens) technical course led by Gabriel Vial, at the Musée des Tissus in Lyon, France. Together they published two articles in the Textile Museum Journal on Mughal Sashes: Sunday, Milton and Nobuko Kajitani. "A Type of Mughal Sash." Textile Museum Journal III, no.1 (1970): 45-54. And Sunday, Milton and Nobuko Kajitani. "A Second Type of Mughal Sash." Textile Museum Journal III, no.2 (1971): 6-12.

During the renovations of the Carnegie Mansion on Fifth Avenue, where the newly named Cooper-Hewitt Museum would open in 1976, Sondag dedicated his time to documenting the collection and designing the Museum's first textile conservation laboratory. Sondag worked at the Cooper-Hewitt Museum from 1977 – 2001. During that time he added significant textiles to the collection – the most important being the 17th century Safavid period velvet with four women in a pleasure garden (1977-119-1). His favorite Cooper-Hewitt all-textile exhibitions are: "Lace in the Collection of the Cooper-Hewitt Museum" (exhibition and catalog, 1982); "Damask" (from the collection of the Cooper Hewitt, 1984); "Color, Light, Surface: Contemporary Fabrics" (1990). A leader in the field, and a member of the CIETA directing council for many years, Sondag was one of five founding members of the Textile Society of America, established in 1987. Over the course of his career he has collaborated with international colleagues and institutions and developed a series of workshops focused on the analysis of woven textiles and continuous pattern. These intensive seminars, and the collaboration that developed from them, have been his most rewarding contribution to the field and have been the focus of much of his work.

Renowned for his clear and elegant diagrams of textile structures, throughout his career Sondag has applied his visual and drawing skills to the analysis and recording of woven and non-woven textile structures. His first isometric textile views were drawn for a small exhibition of Islamic drawloom patterned silks organized by Louisa Bellinger while he was at the Textile Museum. Although he has always preferred drawing, he is best known for his use of paper strips to demonstrate woven techniques. He first thought to use paper strips when a student in one of his classes informed him that she could not draw – meaning that she literally could not produce a straight line even with the aid of a straight-edge. By adapting his teaching to include paper strips, rather than requiring that his students draw what they saw, he provided a method that everyone can use with equal accomplishment. The paper strips also have the advantage of being visible both front and back. (After years of teaching with paper strips he jokingly admits to having the world's largest collection of paper shredders.) His work has appeared in a number of publications, including the Textile Museum Journal, the CIETA Bulletin, and Riggisberger Berichte. He is particularly proud of the publication: Sondag, Milton. "Damask: Definition and Technique." In *Leinendamaste: Produktionszentren und Sammlungen* edited by Schorta, Regula, and Cornelis A. Burgers, 113-130. Riggisberg: Abegg-Stiftung, 1999.

While at the Textile Museum Sondag began using Pre-Columbian woven techniques for his own work and he found that the best way to understand a woven technique was through a hands-on approach. With the knowledge and experience gained by having grown up next door to his father and grandfather's woodworking/wheelwright shop, equipped in the 19th century, he designed his first drawloom to experience the simultaneous lifting and lowering of warps that is essential for the weaving of figured damask. He went on to develop a series of looms dedicated to the early Chinese technique of crossing and re-crossing warps (gauze). This hands-on approach carried over into his teaching and every student was given a small scale body tension loom as part of his seminars.

In 2011 he received the Textile Museum's George Hewitt Myers Award – one of the highest honors in the field of textile studies – in recognition of his work and teaching. Currently, Sunday is focused on the organization of his research files. Also, as a visual artist he is expanding his paper strip documentation, adapting his lifelong work with continuous pattern and woven structure to create richly layered figurative images. His work has been shown at the Musée des Tissue in Lyon (Durand, Maximilien, and Pascale Le Cacheux. 2012. *La fabrique des Grands Hommes: Exposition*, Lyon, Musée des tissus, 11 mai-30 septembre 2012. Lyon: EMCC: 135-141) and he has self-published a book of drawings entitled *An Amaryllis Suite* (2009).

Scope and Contents

The archive is arranged in four sections. The first three sections may include the following: a brief introduction; printed articles and correspondence; slides and digital images; paper strip diagrams, model looms, and textile samples; object analysis. The fourth section is comprised of 13 original essays prepared by Milton Sunday as part of the development of this finding aid.

Arrangement

The Milton Sunday Archive is arranged in four sections, or series, as follows:

Series 1 Introduction to Woven Structures and Continuous Pattern; Seminars, Lectures

This section provides a basic overview of woven structures, loom technology and continuous pattern. It includes materials developed by Milton Sunday as part of the in-depth seminars he led at major institutions and universities in the USA and England as well as course material developed by Centre International d'Étude des Textiles Anciens (CIETA).

Series 2 Analysis of Specific Techniques

Composing the bulk of the Milton Sunday Archive, this section is the repository of Mr. Sunday's research focused on specific techniques, including: Complementary Warps, Complementary Wefts (Samit and Taquete), Crossing and Re-Crossing (Gauze), Damask, Double Cloth, Float Pattern, Lampas, Supplementary Wefts, and Velvet. Each category includes an introduction prepared by Mr. Sunday.

Series 3 Miscellaneous Notes and Small Studies: Cultural Studies, Periods and Types

This section includes small case studies and research files organized by geography and period.

Series 4 Essays on Textile Structures and Techniques Prepared by Milton Sunday

This section is comprised of 13 original essays prepared by Milton Sunday as part of the development of this finding aid.

Administrative Information

Access

The Milton Sunday Archive is open to the public by appointment. For access please contact the Antonio Ratti Textile Center at the Metropolitan Museum of Art Main Building. Library hours are Monday–Friday, 10:00 a.m.–12:30 p.m. and 2:00–4:00 p.m. (an appointment is required). Telephone: 212-650-2310 Fax: 212-650-2676 Email: RattiTextile.Center@metmuseum.org

Physical Characteristics

Individual sections may include paper archives, textile samples (stored separately), slides, model looms, original binders with seminar material, digital photos, and VHS recordings.

Source of Acquisition

Gift of Milton Sunday, [2012]

Processing Note

Processed by Milton Sunday and Eva Labson (2012 - present)

Collection Inventory

Series 1. Introduction to Woven Structures and Continuous Pattern; Seminars and Lectures

Series 1: Introduction to Woven Structures and Continuous Pattern; Seminars, Lectures

This section provides a basic overview of woven structures, loom technology and continuous pattern. It also includes materials developed by Milton Sunday as part of the in-depth seminars he led at major institutions and universities in the USA and England as well as course material developed by Centre International d'Etude des Textiles Anciens (CIETA). The following essays, prepared by Milton Sunday, correspond to this series and can be found at the end of the finding aid: *How to Start Looking at a Woven Textile; Loom, Weaving and Associated Terms; Plain Weave; Twill; Satin (Weaves); Floats; and Continuous Pattern.*

Contents include: Diagrams, photos, slides, digital images on CDs, articles, correspondence, and model looms

Subseries 1.1: Introduction 5 Boxes and 4 binders

Box	Folder	
Introduction 1	1	Introduction, Supplies, Useful Terms, Bibliography Contents: Seminar material prepared by Milton Sunday
Introduction 1	2	Introduction to Weaving Contents: Seminar material, paper strip diagrams prepared by Milton Sunday
Introduction 1	3	Course: Drafting Contents: Seminar materials prepared by Milton Sunday, short articles
Introduction 1	4	Looms Contents: Seminar materials prepared by Milton Sunday, photocopied diagrams
Introduction 1	5	Survey of Diagrams - Master Set Contents: Photocopies
Introduction 1	6	Worksheets Contents: Seminar material prepared by Milton Sunday, slides, diagrams
Introduction 1	7	Yarn/Fabric (Posselt) Contents: Photocopy
Introduction 1	8	Gold-Wrapping-Wulff Contents: Photocopy
Introduction 1	9	Course: Threads Contents: Seminar materials prepared by Milton Sunday, photocopies, magazine, slides, diagrams
Introduction 1	10	Course: Introduction Knotting Contents: Notes, diagrams
Introduction 1	11	Single Element Contents: Slides, photos, diagrams, notes
Introduction 1	12	How to Make a Mark Printing, Painting, Dying Contents: Notes, samples
Introduction 2	1	Course Overview - Paper Strips 2005, Los Angeles Contents: Diagrams
Introduction 2	2	Plain Weave
Introduction 2	3	Plain Weave Diagrams
Introduction 2	4	Tapestry Contents: Models, photos, notes, slides
Introduction 2	5	For Wrap Twining vs. Crossing + Re-Crossing Contents: Models

Supplementary --> Not Velvet

Introduction 2	6	2+2 Twill Hound's Tooth Contents: Diagrams
Introduction 2	7	Twills with Pulleys/Counter Balance Contents: Diagrams
Introduction 2	8	Twill Contents: Slides
Introduction 2	9	Twills --> Exercises Contents: Diagrams
Introduction 2	10	Cambodia: 2+1 Twill Mattiebelle Gittinger Contents: Correspondence
Introduction 2	11	11th c. Brick-Work - Iran: Multi-Shaft Geometric, Carol Bier Contents: Correspondence, diagrams
Introduction 2	12	Satins Contents: Diagrams
Introduction 2	13	Satin 4+1 Contents: Course materials
Introduction 2	14	Satin 7+1 Contents: Course materials
Introduction 2	15	Introduction to Basic Structure: Satin - Interruptions Contents: Diagrams, slides and additional practice material
Introduction 2	16	Ginsburg: Double-Sided Satin Weave - China, Metropolitan Museum of Art 2011.112 Contents: Diagrams, notes, CD with images
Introduction 2	17	Satin 4+1 7+1 "Pseudo" Satin Contents: Diagrams
Introduction 2	18	Misc. Organization of Floats Contents: Diagrams, slides and photocopies
Introduction 2	19	Weaving 101 Contents: Diagrams and seminar text
Introduction 2	20	Multi-Shafts Contents: Diagrams
Introduction 2	21	Effects Created by Floats Contents: Diagram
Introduction 2	22	Multi-Shafts - Float Patterns: 8 Shafts Contents: Diagrams
Introduction 2	23	16-Shaft Pattern Contents: Diagrams, textile sample
Introduction 2	24	Multi Shaft Block: Suppl. We --> "Overshot" Contents: Diagram
Introduction 2	25	Multi Shaft Block Patt. Suppl. We --> "Summer + Winter" Contents: Diagram
Introduction 2	26	Multi Shaft Block Patt. Damask: 2 Blocks, 3 Blocks Contents: Diagrams
Introduction 2	27	Multi Shaft Block Patt. Double Cloth Contents: Diagram
Introduction 3	1	Okinawa Contents: Diagrams and correspondence
Introduction 3	2	Sweden Contents: Photocopy

Supplementary --> Not Velvet 11 Folders

Box	Folder	
Introduction 3	3	Supplementary Warps Contents: Diagrams, slides
Introduction 3	4	Two Warps - Crepe Effect Contents: Notes
Introduction 3	5	Supplementary Diagrams Contents: Diagrams and handouts
Introduction 3	6	Laid-in Brocading, Cleveland Museum of Art 16.1280
Introduction 3	7	Surface Bindings Using Warp Threads of Satin Weave Contents: Diagrams
Introduction 3	8	"Overshot" Contents: Diagrams, notes, photocopies, slides
Introduction 3	9	"Summer + Winter" Contents: Diagrams
Introduction 3	10	Supplementary Wefts (Including Pile) Contents: Diagrams, photocopies, slides
Introduction 3	11	Rug Weaving Tibet Contents: Photocopy
Introduction 3	12	Rug "Knots" Contents: Slides
Introduction 3	13	Early Pile Textiles + Rugs 11 Folders Contents: Notes and correspondence

Weft Pile

Weft Pile 15 Folders

Box	Folder	
Introduction 3	13	Sehna Knot Contents: Diagrams and notes
Introduction 3	14	Extra Weft Loops Cut or Laid in Tufts Contents: Diagrams, notes, photos
Introduction 3	15	Extra Weft Loops Contents: Diagrams, notes, photos, slides
Introduction 3	16	Laid-in Tufts (b) Contents: Diagrams and notes
Introduction 3	17	Laid-in Tufts (a) Contents: Diagrams and notes
Introduction 3	18	Ghiordes Knot Contents: Notes, photographs, diagrams
Introduction 3	19	Single Warp Knot Contents: Notes, photographs, diagrams
Introduction 3	20	Sehna Loops Contents: Notes, photographs, diagrams
Introduction 3	21	Slip Loops 9 Folders Contents: Notes, photographs, diagrams
Introduction 3	22	Rug Knot Diagrams 1 Contents: Notes, correspondences, diagrams
Introduction 3	23	Rug Knot Diagrams 2 Contents: Correspondences, diagrams
Introduction 3	24	Rug Knot Diagrams - Not Used Contents: Diagrams
Introduction 3	25	2 Sets of Warp-Threads Contents: Diagrams
Introduction 3	26	Tattersall, Notes on Carpet Knotting and Weaving (1969) Contents: Book
Introduction 3	27	Tattersall, Notes on Carpet Knotting and Weaving (1949) Contents: Books

Jacquard - Surfaces 2 Folders

Box	Folder	
Introduction 3	28	Jacquard Correspondence Contents: Correspondence
Introduction 3	29	Jacquard Weaving - Floats - Damask-Like Contents: Slides, diagrams, photos

"Tri-Axial" 2 Folders

Box	Folder	
Introduction 3	30	"Tri-Axial" Contents: Correspondence, fabric swatches
Introduction 3	31	Satin Contents: Correspondence, articles, diagrams
Introduction 4	1	Bellinger - Weave Classification CIETA!!! Contents: Notes, annotated notes, correspondences
Introduction 4	2	Bühler - Classification Contents: Article
Introduction 4	3	Vial Contents: Notes, diagrams, samples, correspondence
Introduction 4	4	Guicherd Techniques Contents: Books
Introduction 4	5	Bellinger - Sunday Article Not Used in 1964 Contents: Slides, notes, diagrams, photos,
Introduction 4	6	Emery - Notes Contents: Notes, correspondence
Introduction 4	7	King (Notes) Contents: Article
Introduction 5	1	Milton's Class (New York University) With Lucy Commoner (Cooper-Hewitt Museum) Part 1 and 2 CDs (unedited video) Contents: CDs
Introduction 5	2	Milton Sunday Past Exhibitions Contents: CDs
Introduction 5	3	Cooper-Hewitt Museum Interview: Lucy Commoner with Milton Sunday, July 22 and 23, 2013 Contents: Transcript and CD

CIETA Course Material

Introduction 5 4 Textile Museum George Hewitt Meyers Award, 2011 **Contents:** Notes, correspondence, PowerPoint presentation

CIETA Course Material 3 Folders and 2 binders

Box	Folder	
Introduction 5	5	Milton's CIETA Course Notebook (1968) Contents: Notes, diagrams, textile samples
Introduction 5	6	Calvin Hathaway's CIETA Samples I (1957) Contents: Notes, diagrams, textile samples
Introduction 5	7	Calvin Hathaway's CIETA Samples II (1957) Contents: Notes, diagrams, textile samples
 Binder		
Introduction 1		Jane Merritt's CIETA Course Notes (1988) Contents: Notes, diagrams
Introduction 2		Reorganization of: Traces Techniques, CIETA 1979 Contents: Notes, diagrams

Milton Sunday Fabric Analysis and Appreciation Course 2 Binders

 Binder		
Introduction 3		Milton Sunday Fabric Analysis and Appreciation Course Outline I Contents: Notes, diagrams
Introduction 4		Milton Sunday Fabric Analysis and Appreciation Course Outline II Contents: Notes, diagrams, textile samples
Introduction 5		Final Exam with 23 textile samples Contents: Textile samples and analysis

Subseries 1.2: Looms - In Process**Subseries 1.3: Motif and Continuous Pattern Research 3 Boxes****Introduction, Talks and Publications 8 Folders**

Box	Folder	
Continuous Pattern 1	1	Continuous Pattern Text Contents: Notes
Continuous Pattern 1	2	Introduction Contents: Notes, slides
Continuous Pattern 1	3	Repeat Contents: Notes, slides
Continuous Pattern 1	4	MS Essay "Woven from the Soul, Spun from the Heart" Contents: Photocopied book chapter
Continuous Pattern 1	5	Cleveland Museum of Art Boy's Coat, Samit, 8th c. 96.2a - Not a Pre-Programmed Repeat Contents: Notes
Continuous Pattern 1	6	Continuous Pattern Seminar Contents: Notes, slides
Continuous Pattern 1	7	"Aspects of Symmetry" CIETA Talk October 4, 1989, Chicago Contents: Notes, slides

Games

Continuous 8 Continuous Pattern MS Lecture/Workshop **Contents:** Notes, slides
Pattern 1

Games 3 Folders

Box	Folder	
Continuous Pattern 1	9	Dürer/Repeat Contents: Slides, photos
Continuous Pattern 1	10	William Morris Game Contents: Photocopies, photos, slides
Continuous Pattern 1	11	"Fun Pieces" Contents: Photocopies

Themes and Studies 1 Box

Box	Folder	
Continuous Pattern 2	1	Joseph Albers "Interaction of Color", Miscellaneous Color Contents: Photos, slides
Continuous Pattern 2	2	Nature - No Repeats Contents: Photos, slides
Continuous Pattern 2	3	Design/Art/Paintings/Etc... Contents: Photos, slides
Continuous Pattern 2	4	Graphics: Transparent to Opaque Contents: Slides
Continuous Pattern 2	5	Grotesque(s) Contents: Notes, offprints, slides
Continuous Pattern 2	6	Plants - Art Nouveau Contents: Slides
Continuous Pattern 2	7	Chevron Contents: Slides
Continuous Pattern 2	8	Plant on Mound Contents: Slides
Continuous Pattern 2	9	Twig and Branch Contents: Photos, offprints, slides, notes

Fabrics with Lace Motifs and Lace Netted Fabrics 4 Folders

Box	Folder	
Continuous Pattern 2	10	Fabrics with Lace Motifs and Lace Netted Fabrics - Images, Slides and Notes Contents: Notes, slides and photographs
Continuous Pattern 2	11	Fabrics with Lace Motifs and Lace Netted Fabrics - Catalog Cards Contents: Photocopies
Continuous Pattern 2	12	Fabrics with Lace Motifs and Lace Netted Fabrics - Needle and Bobbin Club Bulletin (1945) Contents: Bulletin
Continuous Pattern 4		Fabrics with Lace Motifs and Lace Netted Fabrics - Diderot Plate Contents: Oversized photograph
	Folder	

7 Repeat Types

Continuous 13
Pattern 2

Indonesian Repeats **Contents:** Photocopies

7 Repeat Types 1 Box

Box Folder

Continuous 1
Pattern 3

#1-Straight Repeat **Contents:** Slides, photocopies, notes

Continuous 2
Pattern 3

#2a Hinged on Vertical Axis **Contents:** Photocopies, notes

Continuous 3
Pattern 3

#2b Hinged on Lateral Axis **Contents:** Slides, photocopies, notes

Continuous 4
Pattern 3

#2c Hinged on Lateral and Vertical Axes **Contents:** Slides, photocopies, notes

Continuous 5
Pattern 3

#2d False Vertical Axis **Contents:** Photocopies, notes

Continuous 6
Pattern 3

#2d False Vertical + Lateral Axes **Contents:** Notes

Continuous 7
Pattern 3-7

#3 Revolved **Contents:** Slides, photocopies, notes

Continuous 8
Pattern 3

#4 Offset **Contents:** Slides, photocopies, notes

Continuous 9
Pattern 3

#5 Rotation **Contents:** Slides, photocopies, notes

Continuous 10
Pattern 3

#5 Rotation (A Pivot) Shawls **Contents:** Slides, photocopies, notes

Continuous 11
Pattern 3

#6 Combination **Contents:** Slides, photocopies, notes

Continuous 12
Pattern 3

#7a Width Placement - to Continue **Contents:** Slides, photocopies, photos

Continuous 13
Pattern 3

#7b Width Placement - Contained **Contents:** Slides, photocopies

Volume

Continuous
Pattern 1

Gentile, Terry A. "Printed Textiles: A guide to Creative Design Fundamentals." Edgewood: Prentice-Hall, Inc. 1979.

Subseries 1.4: Videos

Mackie, Louise W. "Threads of Time Handmade Textiles for Weddings in Fez, Morocco." Toronto, Ont., Canada: Royal Ontario Museum, 1996. (VHS) running time 26 minutes.

Myers, Diane K., Susan S. Bean, Michael Aris, and Franc oise Pommaret. From the Land of the Thunder Dragon: Textile Arts of Bhutan. 1994. (VHS) running time 12 minutes.

Stack, Lotus. "Two Chinese looms." Minneapolis, Minn: Minneapolis Institute of Arts, Media Production Department, 1985. (VHS) running time 15 minutes.

Series 2. Techniques

Stack, Lotus. "Textile Video Documentation Project: Morocco." Personal video recording 1989, 1990. (VHS) running time 2 hours.

Stack, Lotus. "Creating the Decorative Cloth." Minneapolis, MN: The Institute, 1993. (VHS) running time 45 minutes.

Series 2. Techniques

Series 2: Techniques

Composing the bulk of the Milton Sunday Archives, this section is the repository of Milton's research focused on specific techniques, including: Complementary Warps, Complementary Wefts (Samit and Taquete), Crossing and Re-Crossing (Gauze), Damask, Double Cloth, Float Pattern, Lampas, Supplementary Wefts, Velvet. Corresponding essays, prepared by Milton Sunday, can be found at the end of the finding aid.

Contents include: Diagrams, photos, slides, digital images on CDs, articles, correspondence, and textile samples

Subseries 2.1: Complementary Structures - In Process 6 Boxes

Subseries 2.2: Crossing and Re-Crossing (Leno/Gauze) - In Process

Subseries 2.3: Damask 7 Boxes of notes, 2 oversized boxes of diagrams, and 1 box of samples

Damask: Periods and Places 2 Boxes

Box	Folder	
Damask 1	1	Damask Cooper-Hewitt Museum Contents: Photocopies
Damask 1	2	Metropolitan Museum of Art Damask 36.90.391 Contents: Photocopies, notes
Damask 1	3	Winterthur
Damask 1	4	Damask 20th Century Weavers: Jung, Bryant Contents: Slides, notes, book
Damask 1	5	Damask 20th Century Contents: Slides
Damask 1	6	Artists: Dora Jung, Rosbch, Other Contents: Photocopied book chapters, photocopies, photos
Damask 1	7	Damask, China "Yuan" Contents: Photocopies, photos, notes
Damask 1	8	2 Safavid Silk Damasks Contents: Slides, photocopies, photos, notes
Damask 1	9	Silk Damask Mostly Traditional 17th Century Patterns Contents: Slides, photocopies, photos, notes
Damask 1	10	Damask 18th Century Silk and Linen Contents: Slides
Damask 1	11	Silk Damask 19th Century Contents: Photocopies
Damask 1	12	English Damask Smithsonian Contents: Photos
Damask 1	13	"Mamluk" Damask Contents: Slides, notes, journal, CD
Damask 1	14	Damask Contents: Journals
Damask 1	15	Miscellaneous Early China Contents: Slides

Damask Images

Damask 1	16	Twill Damask - Sung, etc. Contents: Notes
Damask 1	17	"Asia" to Egypt (Mamluk) Contents: Photocopies, notes

Damask Images 8 CDs

Box		
Damask 2		Damask China #1
Damask 2		Damask China #2
Damask 2		Damask 7+1 Satin #1
Damask 2		Damask 7+1 Satin #2
Damask 2		Damask 7+1 + 1+1 #1
Damask 2		Damask 7+1 + 1+1 #2
Damask 2		English Damask
Damask 2		Titi's Damask Robe
Folder		
Damask 2	1	China - European Pattern, Museum of Fine Arts Boston, 2009.4628 Contents: Photocopies, notes, CDs
Damask 2	2	China for Export - All Periods Contents: Slides, photocopies, photos, notes, correspondences
Damask 2	3	Damask China for Export Contents: Photocopies, notes
Damask 2	4	Silk Damask Chinese Export
Damask 2	5	Cooper-Hewitt Museum 1902-1-914 7+1 Satin for Export China Contents: Photocopies, notes, correspondences
Damask 2	6	Cooper-Hewitt Museum 1953-162-70 4+1 Satin Contents: Slides, photocopies, photos, notes
Damask 2	7	Cooper-Hewitt Museum 1962-56-188 4+1 Satin Damask China for Export Contents: Notes
Damask 2	8	Cooper-Hewitt Museum 1962-56-7 Damask China for Export Contents: Notes
Damask 2	9	Cooper-Hewitt Museum 1962-56-189 4+1 Satin Damask China for Export Contents: Slides, photos, notes
Damask 2	10	Cooper-Hewitt Museum 1967-20-19 7+1 Satin Damask China for Export Contents: Notes
Damask 2	11	Cooper-Hewitt Museum 1966-66-1 4+1 Satin Damask China for Export Contents: Notes
Damask 2	12	Cooper-Hewitt Museum 1962-56-192 7+1 Satin Damask China For Export Contents: Notes
Damask 2	13	Cooper-Hewitt Museum 1931-4-54 4+1 Satin Damask China Contents: Notes
Damask 2	14	Cooper-Hewitt Museum 1953-123-1 4+1 Satin Damask China (Ashburnham) Contents: Slides, photocopies, notes, CDs
Damask 2	15	Cooper-Hewitt Museum 1953-162-32 4+1 Satin Damask "Mamluk" Contents: Slides, photos, notes
Damask 2	16	Cooper-Hewitt Museum 1902-1-875 4+1 Satin Damask "Mamluk" Contents: Slides, photos, notes

Damask: Technique

Damask 2	17	Cooper-Hewitt Museum 1902-1-963 4+1 Satin Damask "Macao" Contents: Photos, notes
Damask 2	18	Cooper-Hewitt Museum 1984-115-1 Damask for "Tibet" Contents: Photos
Damask 2	19	English Damask Contents: Photocopies, photos, notes, CDs, correspondences

Damask: Technique 1 Box

Box	Folder	
Damask 3	1	Damask - Darning Contents: Slides
Damask 3	2	Various Definitions Contents: Photocopies, notes, journal
Damask 3	3	Damask Figured Contents: Slides, photocopies, notes
Damask 3	4	Miscellaneous MS Diagrams Macro Photos Contents: Slides
Damask 3	5	Course: Damask Figured Contents: Slides, photocopies, notes
Damask 3	6	Damask - Course/General Contents: Photocopies, notes
Damask 3	7	Twill Damask Plus - "Plain Weave" Bands Kajitani/Sardjono Contents: Photos, notes, correspondence
Damask 3	8	Damask: 2 Weaves - Avoid Conflicts! Contents: Notes
Damask 3	9	Plain Weave 3-Span Floats 3-Span Floats--> 3 +1 Twill Contents: Photocopies, notes, diagrams
Damask 3	10	1+3 Twill --> 3+1 Twill Contents: Notes, diagrams
Damask 3	11	Damask Full Drafts Contents: Notes, diagrams, offprints
Damask 3	12	4+1 Satin Damask Contents: Notes, diagrams
Damask 3	13	Damask Juxtapositions 4+1/1+4 Satin "Europe" vs. "China" Contents: Photocopies, photos
Damask 3	14	Harriet Tidball Cards with Nobuko Kajitani 1968 - 69 Contents: Diagram

Damask: Technical Development (Abegg 1999) 1 Box

Box	Folder	
Damask 4	1	Damask - Development of - For Abegg Article 1998/99 Contents: Photos, diagrams
Damask 4	2	Damask - Abegg Article 1999 Contents: Photocopies, correspondences, diagrams
Oversize		
Damask 1		Original Diagrams for Abegg Article 1999 1 Contents: Diagrams
Damask 2		Original Diagrams for Abegg Article 1999 2 Contents: Diagrams
Box	Folder	
Damask 4	3	Plain Weave + 3+1 Contents: Slides, notes, diagrams
Damask 4	4	#1 Development from Plain Weave 3-Span Floats Square Grid Pattern Step Pattern
Damask 4	5	Examples Plain Weave + Floats Metropolitan Museum of Art 1996.39 2 folders Contents: Slides, photocopies, notes, diagrams
Damask 4	6	#2 Correcting Diagonal Alignments of Floats Contents: Slides, photocopies, notes, diagrams
Damask 4	7	#3 5,7,9-Span Floats in Plain Weave

Damask: Damask + Supplementary Wefts

Damask 4	8	Plain Weave + 5+1 Contents: Slides, notes, offprints
Damask 4	9	Plain Weave + 5+1 Contents: Slides, notes, offprints
Damask 4	10	#4 1+3 Twill, 3+1 Twill 3 Folders Contents: Slides, notes, diagrams
Damask 4	11	1+3 + 3+1
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Damask 4	13	#5 Changing √ of 3-Span Floats Contents: Slides, notes, diagrams
Damask 4	14	#6 1+3 Twill, 5, 7-Span Floats Contents: Slides, notes, diagrams
Damask 4	15	#7 Lifting + Lowering Contents: Slides, notes, diagrams
Damask 4	16	#8 Leading into/+ Satin

Damask: Damask + Supplementary Wefts 1 Box

Box	Folder	
Damask 5	1	Damask 4+1 Satin + Supplementary Wefts, Metropolitan Museum of Art, NYC Contents: Photocopies, notes, diagrams, CDs
Damask 5	2	Damask 4+1 Satin + Supplementary Wefts, Cooper-Hewitt Museum Contents: Photocopies, notes, diagrams
Damask 5	3	4+1 Satin Damask Supplementary Wefts + Bindings Contents: Notes, diagrams
Damask 5	4	Art Institute of Chicago, Supplementary Weft Contents: Photocopies, slides
Damask 5	5	Museum of Fine Arts Boston, Brocaded Damask Contents: Photocopies, notes, diagrams, correspondences
Damask 5	6	Damask 4+1 Satin + Supplementary Wefts, Victoria and Albert Museum (V&A) Contents: Slides, photocopies
Damask 5	7	17-18th Century Boston Museum of Fine Arts. Supplementary Weft Contents: Notes, diagrams

Damask: MS Studies, Talks 1 Box

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Damask 6	1	Abegg Talk May 2014 Contents: Presentation slides, flashdrive
Damask 6	2	John Peter Wild, etc. Byzantine Damask Contents: Slides, notes, offprints,
Damask 6	3	De Jonghe - "Roman" Damask See MS Trial Warp Mounted on Board Contents: Photocopies, diagrams, offprints
Damask 6	4	Damask Talk - TSA New York, Sept., 1998 #1 Contents: Speech drafts, notes
Damask 6	5	Damask Talk - TSA New York, Sept. 1998 #2 Contents: Slides

Damask: Publications 1 Box

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Damask 7	1	Lubo - Lesnicenko, CIETA Bulletin #11 (Jan., 1960) Contents: Photocopies
Damask 7	2	De Jonghe + Tavernier, Floats in Plain Weave, CIETA Bulletin 1982 1+2 Contents: Offprints
Damask 7	3	Zhao, Feng Contents: Diagrams, offprints, journals
Damask 7	4	Damask --> Turkey (Louise Mackie) Contents: Offprints
Damask 7	5	Becker, John Contents: Photocopies of books

Damask Textile Samples

Damask 7	6	Damask, Gilroy 1844 Contents: Photocopies of books
Damask 7	7	Damask, Watson 1913 Contents: Offprints
Damask 7	8	Course: Damask - Block Contents: Diagrams
Damask 7	9	Damask - Block Pattern "Old" + "New" Contents: Offprints, journals
Damask 7	10	Linen Damask, N. Europe Contents: Photocopies, photos, journals, correspondences
Damask 7	11	Bulletin van het Rijksmuseum Contents: Photos, journal
Damask 7	12	Emily Post "We Dine on Linen Damask" Contents: Book
Damask 7	13	17th Century Dining and "We Dine on Linen Damask" Contents: Slides, photocopies of books

Damask Textile Samples 1 Box of 25 textile samples

Subseries 2.5: Float Pattern - In Process

Subseries 2.7: Supplementary Wefts - In Process

Subseries 2.8: Velvet - In Process

Subseries 2.9: Models of Embroidery Stiches - In Process

Series 3. Miscellaneous Notes and Small Studies: Cultural Studies, Types and Periods

Series 3: Miscellaneous Notes and Small Studies: Cultural Studies, Types and Periods

This section includes small case studies and research files organized by geography and period.

Contents include: Slides, photos, postcards, notes, correspondence, and articles

Subseries 3.1: Asia 4 Boxes

China 3 Boxes

Early China 1 Box

Box	Folder	
Misc. Studies and Notes 2	1	Early China - Slides Contents: Slides
Misc. Studies and Notes 2	1	Early China Various Articles Contents: Photos, photocopied articles
Misc. Studies and Notes 2	3	Early China Silks Contents: Photocopied articles, offprints

China

Misc. Studies and Notes 2	4	China-Early Uses of Coverings, Boston Scroll	Contents: Pictures
Misc. Studies and Notes 2	5	Miscellaneous Early China and Russia	Contents: Photocopied articles
Misc. Studies and Notes 2	6	K. Ribound CIETA Article-"A Brief Account of Textiles Excavated in Dated Liao Dynasty Tombs (907- 1125 A.D.) in China" CIETA Bulletin 74, (1997).	Contents: Photocopied articles
Misc. Studies and Notes 2	7	Nara Period	Contents: Photocopied articles
Misc. Studies and Notes 2	8	Brooklyn Museum-Martin Collection-Chinese Scrap Book L.52.10.*	Contents: Notes, photocopied articles
Misc. Studies and Notes 2	9	Cleveland Museum of Art, Shosoin (late 8th c.) 1954.70.1-.55.	Contents: Notes
Misc. Studies and Notes 2	10	Checklist with Notations for Chinese Textiles from the "China: Dawn of a Golden Age, 200-750 A.D." Exhibition The Metropolitan Museum of Art	Contents: Photos, notes

China 1 Box

Box	Folder		
Misc. Studies and Notes 3	1	Chinese for Europe/or For China itself	Contents: Pictures, photocopied articles
Misc. Studies and Notes 3	2	Chinese/Islamic Italian 14th Century	Contents: Slides, notes, pictures
Misc. Studies and Notes 3	3	14th-15th Century Chinese/Islamic/Italian	Contents: Slides, photos, notes
Misc. Studies and Notes 3	4	Chinese Symbols	Contents: Pictures
Misc. Studies and Notes 3	5	China Woven	Contents: Notes, pictures

Portraits 2 Folders

Box	Folder		
Misc. Studies and Notes 3	6	Portraits-China 1of 2	Contents: Slides, pictures
Misc. Studies and Notes 3	7	Portraits - China 2 of 2	Contents: Pictures

Metropolitan Museum of Art 1999.44 Chinese Patchwork 1 Box

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Misc. Studies and Notes 4	1	Introduction	Contents: Technical description by Zhao Feng, photos, diagram
Misc. Studies and Notes 4	2	Notes	Contents: Notes

Japan

Misc. Studies and Notes 4	3	Metropolitan Museum of Art 46.156.21, .23 Contents: Photos, notes, diagrams
Misc. Studies and Notes 4	4	Diagrams Contents: Diagrams
Misc. Studies and Notes 4	5	Metropolitan Museum of Art 1994.44.8, .12, .24a,b Contents: Photos, notes, diagrams
Misc. Studies and Notes 4	6	Metropolitan Museum of Art 1994.44.1 Contents: Photos, diagrams
Misc. Studies and Notes 4	7	Metropolitan Museum of Art 1994.44.3 Contents: Photos
Misc. Studies and Notes 4	8	Metropolitan Museum of Art 1994.44.6 Contents: Photos, diagrams
Misc. Studies and Notes 4	9	Metropolitan Museum of Art 1994.44.7a,b Contents: Photos
Misc. Studies and Notes 4	10	Metropolitan Museum of Art 1994.44.8 Contents: Photos
Misc. Studies and Notes 4	11	Metropolitan Museum of Art 1994.44.9, .13 Contents: Photos, notes, diagrams
Misc. Studies and Notes 4	12	Metropolitan Museum of Art 1994.44.10 Contents: Photos, notes
Misc. Studies and Notes 4	13	Metropolitan Museum of Art 1994.44.11a-d Contents: Photos, diagrams
Misc. Studies and Notes 4	14	Metropolitan Museum of Art 1994.44.13b Contents: Photos
Misc. Studies and Notes 4	15	Metropolitan Museum of Art 1994.44.14a-c Contents: Photos, notes, diagrams
Misc. Studies and Notes 4	16	Metropolitan Museum of Art 1994.44.19 Contents: Photos, diagrams
Misc. Studies and Notes 4	17	Metropolitan Museum of Art 1994.44.20 Contents: Photos, notes, diagrams
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Misc. Studies and Notes 4	19	Metropolitan Museum of Art 1994.44.24c

Japan 1 Box

Box	Folder	
Misc. Studies and Notes 5	1	Japan Contents: Slides, notes
Misc. Studies and Notes 5	2	Japan/Sasaki Contents: Photocopied articles
Misc. Studies and Notes 5	3	Sasaki (1951) Contents: Book, photocopied book with notes

Subseries 3.2: Europe

Misc. Studies and Notes 5	4	Nanako-Sasaki (1958) Contents: Book, photocopied book with notes
Misc. Studies and Notes 5	5	Shosoin Felt Rugs Contents: Slides, photos
Misc. Studies and Notes 5	6	Macao Contents: Photo
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Subseries 3.2: Europe 2 Boxes**Spain 6 Folders**

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Misc. Studies and Notes 6	1	14th-15th Century Contents: Slides, photos, notes
Misc. Studies and Notes 6	2	Hispano-Moresque Contents: Photos, articles
Misc. Studies and Notes 6	3	Hispano-Moresque-Cooper Hewitt Collection and related Abegg pieces Contents: Slides, photos, journals, correspondences
Misc. Studies and Notes 6	4	Morocco Contents: Photos, notes, diagrams
Misc. Studies and Notes 6	5	15th Century Spain/Italy Contents: Slides
Misc. Studies and Notes 6	6	16th Century Spain/Italy Contents: Slides, photos

Italy 3 Folders

Box	Folder	
Misc. Studies and Notes 6	7	Italy 14th-15th Century Miscellaneous Contents: Photocopies, photos, journals, postcards
Misc. Studies and Notes 6	8	Lucca Style-Venice 14th Century Contents: Slides, photos, journals
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Misc. Studies and Notes 6	10	Fustian Contents: Slides, photocopies, photos, notes, diagrams, negatives, correspondences
Misc. Studies and Notes 6	11	German 14th-15th Century Contents: Slides, photos
Misc. Studies and Notes 6	12	Swedish Contents: Slides, notes
Misc. Studies and Notes 6	13	Western Europe 16th Century Contents: Photos

19th Century Thesis Books

Misc. Studies 14 Polish Sashes: Samite, Lampas Taqueté **Contents:** Photocopy of book
and Notes 6

19th Century Thesis Books 7 Folders

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Misc. Studies and Notes 7	1	19th Century Thesis Books Contents: Notes
Misc. Studies and Notes 7	2	Thesis Book Cooper-Hewitt Museum 1939-40-2 Contents: Slides, notes, diagrams
Misc. Studies and Notes 7	3	Thesis Book Cooper-Hewitt Museum 1958-3-1 Contents: Slides, notes
Misc. Studies and Notes 7	4	Thesis Book Cooper-Hewitt Museum 1958-24-1 Contents: Slides, notes
Misc. Studies and Notes 7	5	Thesis Book Cooper-Hewitt Museum 1958-24-2 Contents: Slides, diagrams
Misc. Studies and Notes 7	6	Thesis Book Cooper-Hewitt Museum 1961-129-2 Contents: Slides, notes

Thesis Book Cooper-Hewitt Museum 1961-129-5 Contents: Slides, notes**Subseries 3.3: Near/Middle East, Africa 2 Boxes**

Box	Folder	
Misc. Studies and Notes 8	1	"Black Africa" Contents: Slides, photos

Coptic

Box	Folder	
Misc. Studies and Notes 8	2	Early Silk Sassanian Style Complementary Weft Contents: Slides, photos, notes
Misc. Studies and Notes 8	3	"Coptic" Sassanian (Figural Tapestry-All Over Pattern) Contents: Slides, photos
Misc. Studies and Notes 8	4	Early Near Eastern Silks 5th-7th Century (Complementary Weft) Contents: Slides, photos, notes
Misc. Studies and Notes 8	5	Early Roundel Silks (Complementary Weft) Contents: Slides, photos, notes
Misc. Studies and Notes 8	6	Supplemental Weft, Wool and Linen Roundel Style Contents: Photos
Misc. Studies and Notes 8	7	Tapestry + Pile "Coptic" Contents: Photos
Misc. Studies and Notes 8	8	Coptic Tapestry Roundels Contents: Slides, photos
Misc. Studies and Notes 8	9	Miscellaneous Coptic Contents: Slides, photos

The Buyids

Misc. Studies 10 Early Wool, Complementary Weft, Figural 9 Folders **Contents:** Slides, photos
and Notes 8

The Buyids

Box	Folder	
Misc. Studies and Notes 8	11	Buyid Type 13th-14th Century Contents: Slides, photos, notes, correspondences
Misc. Studies and Notes 8	12	Buyid, 1973 Abegg + Other Contents: Journals, correspondences
Misc. Studies and Notes 8	13	The Buyids Contents: Journals
Misc. Studies and Notes 8	14	"Those Questionable Islamic" 11th-12th Century 4 Folders Contents: Slides, photos, notes,
Misc. Studies and Notes 9	1	Near East or Spanish 11th-12th Century, Roundel Style, Various Techniques (Samit + Lampas) Contents: Slides, photos, notes
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Misc. Studies and Notes 9	3	Near East Early Contents: Bulletin
Misc. Studies and Notes 9	4	15th Century Mamluk (?) Contents: Slides, photos, notes
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Misc. Studies and Notes 9	6	Turkey-Morocco Contents: Slides, photos
Misc. Studies and Notes 9	7	12th-13th century Mediterranean-Near East Contents: Slides, photos, notes, journal
Misc. Studies and Notes 9	8	Seljuq-Persia Contents: Slides, photos, notes, drawings
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Series 4. Essays on Structure and Technique by Milton Sunday

Series 4. Essays on Structure and Technique by Milton Sunday

This section is comprised of 13 original essays prepared by Milton Sunday as part of the development of this finding aid.

How to Start Looking at a Woven Textile by Milton Sunday

Below are two sets of questions that might be used as a way of starting to looking at a textile. In order to begin, first identify the warp, and position the textile so that your gaze when straight ahead follows the warps as verticals. Make a

How to Start Looking at a Woven Textile by Milton Sunday

sketch of the textile for future reference. Note the warp and pattern directions. Indicate whether there are selvages as well as side and end finishes. Sign and date your documentation.

While there are a few forms specific to institutions and researchers it is best to make your own.

The **first set of questions** is about **pattern**, which might tell you what type of loom the textile was woven on:

Is the textile patterned in the manner of a twill, with continuous diagonals, or does it have reversed diagonals for herringbones, diamonds, or a damask with squares and rectangles, or even small flowers such as could have been woven on a multi-shaft loom?

Or on the other hand, is the pattern composed of curvilinear motifs such as flowers that would have been woven on a drawloom or jacquard loom?

The **second set of questions**, putting aside actual weaving techniques, is about **surfaces** which, together with pattern, will help you identify what type of weave and structure the textile has:

How many surfaces does the textile have?

For example: Is there a contrast between surfaces, one warp-dominated and the other weft-dominated? If there appears to be only one set of warps and one set of wefts the textile is likely a damask. Or does the textile have two contrasting surfaces, one weft-oriented and the other warp-oriented, with two sets of warps and two sets of wefts, each set with a different function. This is very likely what is commonly called a *lampas*.

Is there a single structural surface with a pattern, or two or more colors? This textile might be tapestry-woven and have one set of wefts, no matter how the various areas abut.

Another possibility: Is there a single structural surface with a pattern of two or more colors? If so, the technique could be one of the two that use complementary wefts, *taqueté* or *samit*. (Re: complementarity, a concept introduced by Irene Emery, see her *Primary Structures of Fabric* (Washington, D.C.: The Textile Museum, 1966), pp. 74, 150-54, et al).

Pile can be either warp or weft, of which there are two types for each – simple or compound.

Simple structure: A weft or warp in a plain weave, for example, can be pulled up to form a loop without disturbing the structure. In this case the structure would be described as simple. **Compound structure:** A weft or warp can be added to a basic foundation, in which case the structure would be described as compound. Wefts can purposely be added to a foundation structure for pile. The so-called ‘knots’ for carpets fall into this category though technically they are not, in my opinion, knots, but a form of wrapping around warps. (Wrapping has a forward and back sequence, such as forward over two warps, back under one, etc.) The so-called ‘ghiordis’ knot is symmetrical where the so-called ‘senah’ knot is asymmetrical. What is known as the ‘Spanish’ knot engages a single warp. Warps can also be used for pile. A familiar example is terry cloth, which has loops of supplementary warps on both sides. Velvet also falls within this category and is a textile that is familiar yet under-researched. If you see warps that cross and re-cross and are not twisting around each other, you are looking at what is commonly known as gauze or leno.

Having done an introductory diagnosis you have started to grasp the concept that there are simple and compound structures. A simple structure has one set of warps and one set of wefts. Textiles that have simple structures include plain weave, twills, satins, damask with its contrasting surfaces, simple float patterning, simple complementary warps, simple complementary wefts, and crossed and re-crossed warps (gauze). (The term complementary means that a minimum of two warps or two wefts function as one structural warp or weft unit while being manipulated for pattern.)

A compound structure has more than one set of warps and or wefts. Textiles that have compound structures are double cloth, lampas, compound complementary warps, compound complementary wefts, and velvet. In addition, any simple

Loom, Weaving and Associated Terms by Milton Sondag

structure such as damask that is brocaded (i.e. has an additional discontinuous or localized supplementary weft) is, by default, a compound structure.

Loom, Weaving and Associated Terms by Milton Sondag

Loom: A loom is an implement that:

1. Keeps a set of threads – the warp – under tension;
2. Provides the means by which at least two sheds can be made (a shed being the separation of warps onto two levels one above the other to allow for the insertion of a weft or wefts).

Weaving: Weaving is the act of using a loom. **Structure vs. Technique:** The term “structure” refers to the weave itself, such as plain weave, twills, satin weaves, crossed and re-crossed warps, etc.

The term “technique” refers to the way the warp is created and the way the sheds are made for any given structure. (Not all interlacing was done on a loom – viz. darning.) For example: plain weave is not a technique, it’s a structure. Conversely, damask is not in itself a structure but a technique.

Introduction to Plain Weave by Milton Sondag

Note: I am discussing here a structure that is woven and should not be confused with one that is needle-worked or darned in the over-under sequence.

The interlacing order of plain weave is the simplest sequence there is in weaving – over one and under one – but considering the wide range of variations, describing the structure is far from simple. As with all structures, plain weave can be warp-faced, weft-faced (with many degrees in between) or in other ways dominated by warps and wefts – such as by their diameter, fiber or spacing. Color is a crucial enhancing factor, for example in stripes, bands, checks and plaids.

A balanced plain weave is one with the same warp and weft counts where the warps and wefts are the same diameter. If diameters differ even slightly, modifying the visual and tactile effects, describing the weave only by these counts is challenging if not impossible. Also, counts do not in themselves automatically describe a sheer cloth such as a vintage medical bandage (often called gauze but which does not technically have the structure of gauze). Microscope photos are the only way to see and count the plain weave textile accurately.

Dorothy Burnham, when she published *Warp and Weft: Textile Terminology* (Toronto: Royal Ontario Museum, 1980) preferred the alternate term for plain weave, tabby, and considered plain weave a synonym. (p. 139).

As an interesting aside, the term tabby refers to the name of a district of Baghdad, Attabi, where it was made (OED). The district was named after a companion of the Prophet, and governor of Mecca, because his descendants, Attabiyin, later settled there. In the 12th century tabby was a fine striped cloth and at the beginning of the 14th century it had borders embroidered with gold. (See notes from Louise Mackie to M.S., 7 January, 2015, based on information from the Encyclopedia Irani.)

Introduction to Twill by Milton Sondag

Introduction to Twill by Milton Sunday

From the O.E.D. (Second Edition 1989): tweel, twyll used in the early 14th c. referring to the diagonals that are characteristic of twills.

A twill is commonly represented as a ratio consisting of a number, a diagonal, and another number, but this 3-part ratio does not have a universal format. Below is my format.

A twill is identified by floats aligned on a continuous diagonal that can conveniently be represented by the central section of the letter S or Z.

The first number of the ratio is the warp. If the warp is over one weft it is represented by the numeral 1. If the warp is over two wefts, it is represented by the numeral 2, etc. Likewise, the weft or wefts under the warp or warps can be numbered 1, 2, etc. In this manner then: - 1\2 twill has a single warp over two wefts in their weaving order and the diagonal is S. - 1\3 twill has one warp over three wefts in their weaving order and the diagonal is S. - 3\1 twill has three warps in their weaving order over one weft, and the diagonal is S. - 2\2 twill has two warps, one after the other in weaving order over two wefts in their weaving order, and the diagonal is Z.

Some authors differentiate between odd and even twills, but it seems to me that the distinction is not really necessary: 3/1 being odd and 2/2 being even – the numbers speak for themselves. Both of these twills add up to 4 and this number tells us that the loom had four shafts. It does not tell us how the heddles through which warps are drawn or threaded were actually numbered on the loom front to back, or back to front, nor in what order they were raised, but such information concerns the weaver, it is information about the loom rather than about the fabric.

The already noted 2/1, 1/2 twill is uneven. An even twill requires units of 4 warps and 4 wefts, the basic being 2/2 – a warp-float span of two and a weft-float span of two as well. (The uneven twill with units of four warps and four wefts is 3/1 and 1/3.)

Emery has 22 models of 2/2 (Figs 115 – 136, pp. 93-98 in Irene Emery, *The Primary Structures of Fabrics* (Washington: Textile Museum, 1966, pp. 127 - 131)). Her variations include balanced, warp oriented, and weft oriented twills – distinctions that depend on equal counts of warps and wefts, as well as all wefts being the same diameter.

Diagonals (S and Z) can be combined to create herringbones, diamonds, and a wide variety of small-scale linear patterns.

Herringbones (termed chevrons by Burnham, p. 23 in Dorothy Burnham, *Warp and Weft* (Toronto: Royal Ontario Museum, 180, pp. 154-159)) are parallel zig-zags. That is, they are point-to-point repetitions of alternating S and Z diagonals arranged either vertically or horizontally. The terms used by these two authors vary, and having two different terms to describe the same type of weave adds to the description. Both Emery and Burnham describe herringbones by visually extending a straight line through the points. When the point-to-point rows are “horizontal” the lines are vertical, which for Emery is a Vertical Herringbone and for Burnham a Warp Chevron. When the point-to point rows are “vertical” the lines are horizontal, which for Emery is a Horizontal Herringbone and for Burnham a Weft Chevron.

Diamonds are horizontally-mirror-imaged chevrons.

In twills in which diagonals change either on horizontal axes alone, vertical axes alone as for herringbones, or both axes as for diamonds, the diagonals meet in one of two ways. First: point-to-point, which Burnham and Emery both describe as pointed or symmetrical. Second: with points offset, which Burnham calls offset and Emery calls staggered (illustrated by Fig. 134 on p. 98, a 2/2 diamond twill, and by Fig. 154 on p. 102, a 3/1 horizontal herringbone).

Concerning the term broken: when the continuous S or Z diagonal is changed from one to the other, the changes can be said to break the diagonal. Burnham uses the term “reversed”, and Emery seems to agree but only after discussing symmetrical and asymmetrical or staggered changes (p. 94) – as already noted.

Introduction to Satin (Weaves) by Milton Sunday

Emery uses the term “broken” for twills in which diagonals get nowhere (Emery Figs. 155-158, p. 103). Burnham does not illustrate this configuration but there is no doubt that this is what she calls satinette (p. 114). Here is her entry for broken twill (p. 20): Any form of twill in which the diagonal lines have been deliberately broken. The binding points are not regularly set over by one end on each successive pick, but breaks occur at regular intervals. The 3/1 broken twill (Fr.: satin de quatre) is sometimes referred to as 4-shaft or 4-end satin, or satinette. The term 3/1 broken twill is preferable.” This nowhere-twill might legitimately be called a pseudo-satin.

Introduction to Satin (Weaves) by Milton Sunday

From the OED (Second Edition 1989), the source of the word satin is said to be unclear. The first use in English seems to be in Chaucer, 1366: “the barres were of gold ful fine, Upon a tissue of satyne.”

Structurally, all true satin weaves are an arrangement of floats in which continuous diagonals (distinctive of twills) are avoided. A minimum of five warps and five wefts is required. There is a warp-float face that, on the reverse, is a weft-float face.

Starting with five warps numbered from left to right 1 thru 5: the first binding point (the point at which a warp is fixed by a weft for a warp-float faced satin) is on warp No. 1. The next is not on No. 2, (as it would be for a twill), but on No. 3. In other words one warp is skipped, or: the sequence is interrupted by one warp (No. 2). The next binding point is on warp No. 5, then on No. 2 and finally on No. 4. This sequence has a regular interruption of one warp – 1, 3, 5, 2, 4. The same notation can apply to the weft-float face. An alternate sequence is 1, 4, 2, 5, 3, or an interruption of two warps. The recording of the sequence of binding points always follows the Z direction, as with the examples mentioned here – in which warps are numbered 1 thru 5. The 5-unit satin weave just described has regular interruptions. The 6-unit satin weave is irregular. A satin weave with a unit of 8 warps and wefts is regular but it can also be irregular.

Analyzing a satin weave with fine closely set warps can be challenging. It is often difficult to count the number of wefts which fine and closely set warps span. One of the “tricks” is to look at the structure in the same location in both the Z and S direction. This trick is efficient and far less likely to cause damage than other methods because it might preempt the need for a probe.

Note: At the end of the discussion of twill weaves in this series of introductions there is a four unit structure in which two adjacent warp-overs (or weft-overs) are diagonally aligned, thereby avoiding continuous diagonals. This structure has been referred to as satinette (Dorothy Burnham, *Warp and Weft: Textile Terminology* (Toronto: Royal Ontario Museum, 1980), pp. 154-159) and it could also be described as a fractured twill. It is not a satin weave.

THE TIDBALL CIRCLE Perhaps the best way to determine the possible interruptions of specific satin weaves is presented by Harriet Tidball, whose work is well known to seasoned American hand weavers. See her *Contemporary Satins* (Lansing: The Shuttle Craft Guild, 1962) [See MS archive for a copy.]

Introduction to Floats by Milton Sunday

A float is best explained as being the result of a mistake, the best example of which is the elimination of a warp-over or a weft-over in plain weave. The result will be a warp over three wefts or, on the other side, a weft over three warps.

Floats can be organized diagonally as in twills or dispersed to avoid the diagonal.

Floats can also be used to create small scale patterns that cannot be described as either twills or satins.

Introduction to Continuous Pattern by Milton Sondag

Note: Pattern is used as both a verb and a noun. Continuous applies to the methods by which a pattern is repeated.

PATTERN Pattern is a form of the word *patron*, derived from the Latin *patronus*, or *pater* – father. Father, patron. The two words are related through reproduction. Just as fathers produce heirs who will carry on the heritage of a particular family, patrons support and protect a person, a work, an institution in endeavors that stand for and pass into the cultural heritage of a people.

Patron, pattern. The connection is, again, reproduction. A pattern is something that is prepared specifically to be reproduced, copied, or imitated.

Patterns can take the form of molds into which molten liquid is poured which, upon cooling, forms a solid that duplicates the form of the mold. A pattern can also be the flat shape of the various parts of a garment following which duplicates are cut to be sewn into a 3-dimensional body covering.

The idea is *multiples, duplication, reproduction*.

CONTINUOUS A textile that is embellished or covered endlessly with images or motifs may be said to have a continuous pattern if the images are repeated, vertically and/or horizontally.

A way to understand continuous patterning is to isolate what is known as the pattern unit – the section that contains every element of the image – and looking at the way it is placed on the surface to cover it completely.

Studies of continuous patterns are vital because they are your primary visual experience. Sadly, they are almost never discussed and for this reason the subject has always been my highest priority.

For an excellent step-by-step demonstration of continuous patterns in printing see Terry Gentile, *Printed Textiles: A Guide to Creative Design Fundamentals*. (New Jersey: Prentice Hall, 1979).

THE REPEAT UNIT The repeat unit must contain all the features or motifs of the pattern, be they woven or printed. For practical purposes the unit is squared off. For example: for weaving the pattern is squared off in order to make it conform to warps and wefts. The same is true for printing with engraved plates. For block printing however, the edges are often jagged to disguise the abutment of adjacent units. **REPEAT SYSTEMS** The pattern unit can be repeated in the following five ways. Units may be

- Placed one above the other and side by side – known as a straight repeat.
- Hinged on a vertical axis (point repeat), a horizontal axis, or on both vertical and horizontal.
- Revolved on a central axis. This system might be combined with hinging on a lateral axis.
- Offset vertically or horizontally.
- Rotated.
- Combined in several of the repeat systems named here.

Introduction to Complementary Warps and Wefts By Milton Sondag

The term complementary was first applied to woven textile structures by Irene Emery in her book, *The Primary Structures of Fabrics* (Washington, D.C.: The Textile Museum, 1966). In the section dedicated to this topic, she gives this brilliant definition in the first sentence of the opening paragraph:

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When two or more sets of elements have the same direction in a fabric and are co-equal in the fabric structure, they can be described as being complementary to each other. (p. 150)

The term *complementary* means that two or more threads – warps or wefts – work together as a single structural unit in each shed of a structure. There is a shared relationship. In other words: two warps or two wefts working together complete a single function.

Turning to Emery's diagrams, the first structure (Figs. 244 & 245) has the required minimum of two complementary **warps**. One of these warps is on the front and the other is on the back, and they are held by a set of **wefts** that are there specifically for the purpose of keeping them in place. These wefts alternate with wefts that are structural, going over two warps and under two warps – the two warps being the complementary pairings, the structure being plain weave (though it can also be a twill (2/1)). Patterns can be created by which warp of the pair is on the front and which is on the back.

The next structure (Figs. 246 & 247) has the required minimum of two complementary **wefts** – one on the front and the other on the back – that are held there by a set of **warps** dedicated for the purpose. These warps alternate with warps that are structural, going over two wefts and under two wefts – the two wefts being the complementary pairings. Patterns can be created by which weft of the pair is on the front and which is on the back. If the structure is plain weave, in CIETA terminology it is *taqueté*. If it is any twill structure starting with 1&2 and including a 5-unit satin weave, it is known as *samite*. (Following the work of Donald King, samit is the only term for a textile structure that can be traced as far back as the Greeks. See Donald King.)

Emery ends her first introductory paragraph by saying that "... the structure itself is compound ..." But there are simple versions as well, both warp and weft. Emery illustrates a weft example (Figs. 258 and 259).

It is excruciatingly sad that Emery does not illustrate how pattern is achieved using compound warp and weft complementary structures. (For a suggestion of how a pattern could be achieved, see Dorothy Burnham, *Warp and Weft: Textile Terminology* (Toronto: Royal Ontario Museum, 1980) p. 180 on weft-faced compound weave.)

Emery applies the term complementary only to woven structures but it applies to other techniques as well, such as looping (as for European lace) and knitting for what is known as stranded knitting).

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According to the OED (Second Edition 1989) the origin of the word gauze is uncertain, and there are various forms of the word: gawse, gause, gawz. 1279: Consilium Budeuse cxi, quoted by Du Cange – gazzatum is mentioned among the stuffs which monks are forbidden to wear. This fabric is conjecturally identified with French gaze, and Du Cange conjectures that it might have been named from Gaza in Palestine. (There is no evidence for either supposition.)

The alternate term, favored by hand weavers in particular, is leno, possibly a corruption of Linon, a kind of cotton gauze. 1821: M Browne Diary 11 Aug. – "we at last got a leno cap and an under cap to wear with it." The terms gauze and leno have a technical definition as well: warps that are crossed and re-crossed.

CROSSED AND RE-CROSSED WARPS A basic gauze has pairs of warps that, in the process of crossing and re-crossing, are held in their positions by over-one/under-one interlacing with a weft. After each interlacing, the crossing warp returns to its original position. If all the warps are or were under the same tension it is impossible to determine which warp of the pair was active. Over-one/under-one interlacing in itself does not provide a clue, but if one warp of the

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pair is under higher tension than the other it is clear that the warp under less tension was the active warp – the one that crosses and recrosses.

The first movement of crossing and re-crossing is the same for all warps – S or Z. But the second action is opposite to that of the first. (Dorothy Burnham, p. 62, mistakenly uses the term twist.)

Crossing and re-crossing can be done by hand. Here is the way it is done: with warps side-by-side, at one edge of the warp select a pair, for example on the right. Reach under the left warp of the pair to grasp the second warp of the pair, the one on the right, and lift it under and up to left. This will be the crossing warp. Insert a rod or slat to opened space and continue in this manner across the width of the warp. These will be the crossing warps.

Two sets of heddles will be needed, one for the crossing warps the other for the non-crossing warps. On a very simple loom, a body tension loom is the best example, the two sets of heddles are attached to rods and body's rocking motion to control the tension on warps is crucial. The entire process from making heddles and actual weaving is a rhythmic dance-like experience for the weaver. Weaving with a frame shaft-loom is a very different process and experience.

Crossings can be countered – one pair of warps with a warp pulled up to the left and the adjacent pair with a warp pulled up to the right. Warps can also be paired. An additional cross (an atypical twist) can be added. (See MS notes on an example in the collection of Ginsburg Ltd.) In addition, crossing and re-crossing can be combined with plain weave for pattern.

Fiber has a vital influence. Woven crossings are easiest if warps are smooth fibers, such as silk and synthetics. Linen is also smooth, and cotton, if mercerized, is suitable. Long-staple wool (worsted) is best suited to hand pick-up as seen in pre-Columbian Peruvian examples, the Paracas Period in particular (3rd C. B.C. – 3rd C. A.D.). Hand-spun cotton cannot withstand the tension required for crossing and re-crossing, which may be why gauze is not common in India, if woven there at all.

The crossings mentioned above have pairs of warps. In other words they are 2-warp unit gauzes. Such gauzes are not stable in that the pairs tend to slip from side to side, and therefore, such gauzes must either be sized or glued to a stable surface particularly those that are silk.

Crossing and re-crossing as we think of it today, as a light-weight cloth, no doubt originated in China, the land of silk. As referenced by Li Wenying [Refer to “Silk Artistry of the Qin, Han, Lei, and Jin Dynasties” Yale University Press, 2012, p. 130], archaeological research shows that gauze was being woven before the Han Period (roughly before the 3rd c. B.C.E.), so it is not surprising that there are many Chinese terms – one of them, sha, an open plain weave, that is the same cloth our cotton bandages used to be. But the most interesting is the gauze known as lu.

Luo has units with four warps and because these units are offset in alternating rows they do not separate as do those with 2-warp units.

This structure brings us to a terminology dilemma because it is commonly called complex (a term that is not appropriate for textiles for its lack of clear description). Adele Weibel uses the term fancy, while Emery, Burnham, and Vial use the term complex, so this dilemma has a long history that must be un-done.

The 4-warp unit gauze can be described in visual terms as overlapped widened crossing and re-crossing pairs, so why not leave it at that: it is a 4-unit gauze regardless of where it was woven very early in China or in Peru during the Paracas Period, or not. [Refer to Bird and Bellinger (1954) and D'Harcourt (1962, p. 50 – 53)].

In spite of the fact that silk is the best material for weaving gauze on a loom, weaving this particular 4-unit gauze is difficult, in part because all warps are raised under and up alternately to both left and right. Mistakes are inevitable. Just

Introduction to Damask by Milton Sunday

as damask probably started as a mistake (a 3-span float in plain weave) a mistake is crucial for this gauze, one that led to the development of pattern.

The mistake is the loss of and eventually the purposeful elimination of a single warp-over that causes the four warps that are essential to the structure to form a tight unit. It is also much easier to weave. Patterns can be woven when combined with the un-unitized structure from which this gauze is derived, thereby making weaving much easier. A cloth woven entirely with tight 4-warp units is an ideal foundation for embroidery – of which there are numerous examples.

The earliest surviving patterned examples are breathtaking, even as small pieces. (See this meticulous study: *Shosoin no ra / Shosoin Jimusho hen*. Tokyo: Nihon Keizai Shinbunsha, Showa 46 [1971]). (See also Gabriel Vial, *Tissus de Touen-Houang* 1970, pp. 239, 243, 255, 375, 383.)

The Chinese refer to a 3-warp gauze that, when looked at from a Western perspective could be interpreted as a 2-warp gauze with a supplementary warp for warp-float patterning.

Gauzes woven to the west of China are variations on those with two warps. Those woven in Europe pale in comparison with those woven in China but the sample book in the Cooper-Hewitt Museum (acc. # 1958-3-2) contains richly imaginative examples of what can be done with what is essentially a straightforward structure.

REFERENCES Bird, Junius and Bellinger Pracas *Fabrics and Nazca Needlework* (Washington, D.C.: The Textile Museum, 1954) Burnham, Dorothy *Warp and Weft* (Toronto: Royal Ontario Museum, 1980).

Li Wenying “Silk Artistry of the Qin, Han, Wei, and Jin Dynasties” in Dieter Kuhn, editor *Chinese Silks* (New Haven & London: Yale University Press, p. 130).

Weibel, Adele *Two Thousand Years of Textiles* (New York: Pantheon Books for the Detroit Institute of Arts: 1952) Vial, Gabriel *Tissus de Touen-Houng* (Paris: Louis Hambis, 1970).

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According to the OED (Second Edition 1989) the word “damask” refers to surface decoration, as in a type of steel with a variegated surface [such as Damascus steel]. Concerning fabric: references in English date from the early 15th c., no doubt coinciding with the weaving of linen damask in The Netherlands. “1489: a fayre whyte coueryng of a damaske clothe.”

Practically everyone is familiar with the term damask and the idea that it suggests refined taste and fine dining. A charming little book by Emily Post, *We Dine on Linen Damask* (Irish & Scottish Linen Damask Guild, Inc. 1923) notes in the caption for *The Tea Table* (p. 27): “The tea table may have an all-white covering or a cloth featuring a gay border design in color.” In other words, a table was to be covered with white linen damask.

The most straightforward definition of a damask cloth in today’s technical terms is that it is a simple weave (a weave with one set of warps and one set of wefts) patterned by two contrasting interlaced structures. The two most common structures are first, the four-unit uneven twill (the warp-float face: 3&1 and the weft-float face: 1&3); and second, the five-unit satin weave (the warp-float face 4&1 and the weft-float face 1&4). The eight-unit weave is historically less common (the warp-float face: 7&1 and the weft-float face: 1&7).

The ideal fiber for damask is reeled silk, because of its reflective surface – a quality shared to some degree by fine linen, long-fibered worsted wool and mercerized cotton. As for color, damask tends to be monochromatic, but it may also be polychromatic.

Introduction to Double Cloth by Milton Sunday

There are two types of damask patterns, each with its own history. One is a checkerboard of blocks. The other is curvilinear or figured.

For a history of the structural development of damask (pattern is not discussed) see Milton Sunday, "Damask: Definition and Technique," in *Damask*, Riggisberger Berichte No. 7, 1999, pp. 113-130.

The weaving of figured damask, it may be said without reservation, started in China, where it likely developed from a 3-span float – a mistake in plain weave. It was first seen in the Han Dynasty (20 B.C. – 220 A.D.) as discussed by Zhao Feng in his article "Silks in the Sui, Tang, and Five Dynasties," in *Chinese Silks*, ed. Zhao Feng et al., (New Haven & London: Yale University Press, 2012, p. 227-234.

The history of damask in the West has significant gaps. The earliest surviving example is a silk fragment preserved in the Museum of the Basilica of St. Ambrose in Milan. The pattern of the twill (3&1 / 1&3) is realistic leopards (they have spots), one a female with a cub. The fragment was woven in the Eastern Mediterranean (no doubt in Syria) in the late Roman period (250-550 A.D.), and perhaps inspired by a Chinese silk damask. (For a possible way to weave this damask see M. Sunday's proposal prepared for presentation at the Abegg Stiftung in 2015.)

The history of damask picks up again in the Mamluk Period (1250-1517). The Mamluks controlled the Eastern Mediterranean and supplied Europe with all goods coming from the East as well as from India. Their control waned as Europeans (the Portuguese in particular) found their own routes to the East. For an introduction to Mamluk damask, see Louise Mackie, *Symbols of Power: Luxury Textiles from Islamic Lands* (Cleveland: Museum of Art, 2015) See also two silks in the collection of the Cooper-Hewitt Museum: 1953-162-32 and 1902-1-875.

The earliest surviving Italian damask, in the collection of the Victoria and Albert Museum (acc. no 859-1863), is dated between 1400 and 1452 (viz private correspondence between M. Sunday and Lisa Monnas). Damask was taken up in the lowlands of Northern Europe (particularly The Netherlands) and was well established by the first part of the 16th century. An early example of the high level of design and production in this period can be seen in the linen napkin displaying the royal arms of England dated ca. 1530-47 in Cornelis A. Burgers, *White Linen Damask I & II* (Riggisberg: Abegg-Stiftung, 2014).

Textiles of damask weave seem to be the ultimate in taste and wealth – on a par with the much more obvious gold and silver. There is something precious alluring in these exquisitely drawn and expertly woven linen fabrics, with their patterns that cannot easily be seen as they shift in and out of view depending on the angle of light and surface. (Note: for examples, see the high-quality black-and-white photographs in Burgers, *White Linen Damask I & II*, cited above.)

Identifying a damask in early paintings is challenging because a two-tone monochrome pattern is not necessarily a damask. Only when a pattern is depicted so that in one area it is dark on light and in another area light on dark can it be securely said to be a damask. Only damask captures light in this way. Note that damasks may also be bi-colored, that is, with warps and wefts of two different colors. Damasks can also be brocaded, with silks or various colors as well as gold and silver.

Introduction to Double Cloth by Milton Sunday

In Double Cloth and Double Weave textiles there are two structures that intercross, each with its own set of warps and wefts. That is: there are two layers of cloth, "a" and "b," that change positions one above the other.

Most common is for both cloths to be of Plain Weave, but any structure is possible. And the structure of both cloths need not be the same.

Introduction to Lampas by Milton Sunday

Islamic Double Cloths have a unique feature, which we might call “integration”, in which two sets of warps are interlaced in such a way that there are no longer two intercrossing cloths but one cloth. The term integration here means there is, so to speak, a loss of identity.

Introduction to Lampas by Milton Sunday

The origin of the term is obscure and possibly no older than the 18th century. Sophie Desrosier in a letter to M Sunday dated Jan. 28, 1992 noted that the term was associated with damask – damas-lampas. This makes sense because both techniques have a contrast between a warp-float face and a weft-float face. One could say lampas is a poor man’s damask.

Both damask and lampas have a contrast between an area dominated by wefts and one dominated by warps. Damask, however, is a simple weave, having one set of warps and one set of wefts. Lampas, on the other hand, is a compound weave, having a set of warps and a set of wefts.

It is reasonable to describe lampas as a combination of two structures each with its own set of warps and wefts – one structure foundational and the other supplementary – as I did for many years. A more sensible way of describing it, however, is as a structure that has a second set of warps that is used to attach supplementary wefts to its foundation. The foundation structure is dominated by warps whereas the supplementary structure is dominated by wefts.

A key feature of lampas is the set of supplementary warps. Do these warps interlace with wefts of the foundation? If they don’t, in those areas where supplementary are wefts on the front, there will be two separate layers (which does not make lampas a double cloth as some authors have claimed).

The C.I.E.T.A. Vocabulary of Technical Terms: Fabrics, 2nd Edition (1964), published in French, English, Italian, and Spanish in 1964 (the first international attempt to standardize terms for museum use) has this entry for lampas, which is quite sensible in that it stops short of saying there are two structures: Term used exclusively for figured textiles in which a pattern, composed of weft floats bound by a binding warp, is added to a ground fabric may be tabby, twill, satin, damask, flushing-warp weave, etc. The weft threads forming the pattern may be main, pattern or brocading wefts; they float on the face as required by the pattern, and are bound by the ends of the binding warp in a binding ordinarily tabby or twill which is supplementary to the ground weave. (Page 28)

Nancy Andrews Reath and Eleanor B. Sachs, in *Persian Textiles and Their Technique from the Sixth to the Eighteenth Centuries* (Oxford: Oxford University Press, 1937) as well as Adèle Weibel, in *Two Thousand Years of Textiles*, (Detroit Institute/Pantheon Press, 1952), when referring to what we would identify as a lampas, use the term “Plain Compound Plain Weave, Twill Weave, Satin Weave” presumably to describe the foundation. Unfortunately this term is also used for taqueté and samit by Nancy Andrews Reath in *The Weaves of Hand-Loom Fabrics* (Philadelphia: Pennsylvania Museum of Art, 1927). (Note that both taqueté and samit are compound weaves patterned by complementary wefts.)

Lampas has also, wrongly, been referred to as “tissue” (Natalie Rothstein, CIETA Bulletin No. 11, 1960) which, in the 16th century at least, referred to a cloth decorated with gold or silver weft-loops (Santina Levey, *Elizabethan Treasures: The Hardwick Hall Textiles* (New York: Harry N. Abrams, 1998).

Introduction to Pile (Including Velvet) by Milton Sunday

Introduction to Pile (Including Velvet) by Milton Sunday

PILE Both wefts and warps can be used to create a 3-dimensional loop that in textile terms is known as pile. For an overview, see Louisa Bellinger, "Textile Analysis: Pile Techniques in Egypt and the Near East" in *The Textile Museum Workshop Notes*, Paper No. 12, (December 1955).

WEFT PILE Wefts in a simple weave can be pulled up as straightforward loops to create pile. Wefts may also be added to a foundation weave and pulled up as simple loops to create pile. (Bellinger, Fig. 1) For a splendid late Roman period polychrome example see Metropolitan Museum 10.130.1076, no doubt part of a curtain, the fragment of which has the head of a woman.

Added or supplementary weft pile, in carpets, is described in terms of knots. These so-called knots are not made by drawing a thread through a loop and pulling the loop tight, but are actually a form of wrapping.

The three most common types of so-called knots are: The **ghiordes** or **Turkish**, which is symmetrical and engages two adjacent warps, and is found in the Eastern Mediterranean, specifically Asia Minor, the Caucasus, and to some extent Persia. The wrapping sequence for this "knot" is forward over two, back under one, and again forward over two. This results in an upper and lower pass over two warps. When the lower pass is cut it becomes the so-called ghiordes knot. (See Emery, Figs. 341 and 342, p. 221.)

The **sehna** or **Persian**, which is asymmetrical and engages two adjacent warps, and is found in Persia, the Turkoman area, and China. The sequence for this "knot" is a wrap around one warp with the yarn taken under an adjacent warp and up again for another wrap. If a loop is made following the wrap that is cut it becomes the so-called sehna knot. The working direction can be progressing to the left of right resulting in two minor variations sometimes referred to as open to the left or open to the right. (See Emery, Figs. 343, 344, and 345, p. 222.)

The **Spanish**, which engages a single warp, and is found only in Spain. The sequence for this "knot" is a wrap around a single warp followed by a loop over the adjacent warp and after that another wrap on a single warp. The loops are cut to form the so-called Spanish knot. (See Emery, Figs. 346 and 347, p. 223.)

See also: Charles Grant Ellis, **Oriental Carpets in the Philadelphia Museum of Art** (Philadelphia: Philadelphia Museum of Art, 1988) pp. 288-291, for M. Sunday diagrams of rug "knots."

WARP PILE From the OED (Second Edition 1989): Chaucer (1386) "By her beddes heed sche made a mewe, And covered it with veluettes blue."

Associated words include velure (late 16th c.), velours (late 18th c.) and velveret (late 18th c.) all referring to nap or pile. And there is velouté, referring to the smoothness of a surface or the texture of a sauce.

The term *velvet* is generally reserved for pile that is a set of warps (not wefts) that was **added** to a foundation structure. However, there are exceptions – such as terry cloth*, and the pattern of a group of putatively 13th century velvets with gold discs. (See Milton Sunday, "A Group of Possibly Thirteenth-Century Velvets with Gold Disks in Offset Rows," in *The Textile Museum Journal*, v. 38 and 39 (1999-2000): 101-151.)

It is not generally known that warp pile was used for garments in the late Roman period. For additional information see Louisa Bellinger, "Textile Analysis: Pile Techniques in Egypt and the Near East" in *The Textile Museum Workshop Notes*, Paper No. 12, (December 1955): Fig. 8. The challenge presented by all velvets is the depth of their structure – in other words what is under or hidden by the pile. **VELVET BASICS** If the pile does not cover the entire surface, the velvet is commonly known as one that is *voided*. In this case the foundation weave is visible in the voided areas – unless it is covered by supplementary wefts.

Introduction to Pile (Including Velvet) by Milton Sondag

If the warps for pile were added to a foundation weave (be it plain weave, twill weave, or satin weave) the first thing to look at is what is known as the warp order. This order is the numerical sequence of foundation warps and the space between them for pile warps – a space that can be called a *channel*.

How many warps for pile are in each channel? Three per channel is common. Are pile warps striped? Be aware that there is an important difference between the number of colors in the channel and the total number of colors used across the full width of the velvet.

As mentioned, the foundation structure will be visible in areas with no pile and it is common for these areas to be embellished with wefts specifically for that purpose. A relatively rough plain weave begs to be covered. Are these embellishing wefts continuous from one edge of the pattern to the other or are they discontinuous. Often they are looped and accompanied by silk wefts.

Pile can be cut as well as uncut in the same length. Pile can be of varying heights. Most startling of all perhaps are those velvets that have pile on both sides.

There are many challenges to the analysis of a velvet. A good example is the pair of wefts that act as a *visé* between which a warp is pulled up for pile. It is often the case that each of the wefts in the pair is of differing thickness and material from the other, but the function of both is the same, but this is difficult to see because the *visé* is more or less hidden.

Considering the importance and popularity of velvet there is a peculiar lack of reliable technical information that has been published. For example, when noting the order of warps that includes foundation warps as well as those for pile, there seems to be no term for where pile warps actually are in the order. The term *channel* is therefore useful because it is within this space that warps for color are located and changed according to the exigencies of the pattern.

Concerning color: Pile warps can be striped or there can be several colors per channel – probably no more than three. Note: In some Persian and Indian velvets pile warps were removed from channels and replaced with others of different colors (pile-warp substitution). This is an impressive tour de force technique that unfortunately can be appreciated only when viewing the back of the velvet.

*Terry cloth has a warp pile that consists of warps that were added to a plain weave to produce pile on both sides.