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Pressing Politics: A Technical Study of German and Mexican Political Prints from the Los Angeles County Museum of Art

INTRODUCTION

In advance of the Los Angeles County Museum of Art (LACMA) exhibition titled *Pressing Politics*, co-curators Erin Maynes (Assistant Curator, Rifkind Center for German Expressionist Studies) and Rachel Kaplan (Assistant Curator, Latin American Art) organized a technical study of objects from each of their respective collections with LACMA Conservation, including Madison Brockman (Assistant Paper Conservator), Laura Maccarelli (Associate Conservation Scientist), and Yosi Pozeilov (Senior Imaging Specialist and Photographer). To the authors' knowledge, this is the first in-depth investigation at LACMA into the materials and techniques used to produce the paper supports and printing inks found in these collections. Understanding the raw materials and their processing is key to prolonging their lives through preventive conservation efforts.

Pressing Politics will showcase approximately 60 works of political graphic arts from LACMA's Rifkind Center for German Expressionist Studies and the Latin American Art department and will be installed in the fall of 2022 at LACMA's satellite gallery at Charles White Elementary School, an LAUSD Visual Arts Magnet. This exhibition will be LACMA's first that brings together these powerful images from Germany and Mexico to explore their shared subject matter and artistic strategies. The artworks juxtapose their respective cultures and periods of time, as the curators examine the motivations for creating such charged political imagery, the means of disseminating such images, and their impacts on the development of global modernism.

The study was carried out to investigate the materials and manufacture of a variety of prints, from fine art portfolio prints to mass-produced broadsides and books. The curators hypothesized that each collection may be partly comprised of poor quality, nontraditional, or otherwise unusual materials given that the objects were produced in geographic regions and historical periods characterized by economic hardship or scarcity of "traditional" fine art–making materials (from a Euro-centric perspective). For example, the study prints selected from the Rifkind collection of German Expressionist art were created in the waning years of World War I, a time of great economic hardship after Germany had been depleted of its resources for years. Similarly, study prints from the Latin American Art collection were largely created in the few decades after the Mexican Revolution and often emphasized mass production and consumption.

First impressions

The curators worked with Assistant Conservator Madison Brockman to select an array of paper types from each collection on the spectrum of "fine art collectibles" to "ephemera." This range included one-off fine art prints to collectible portfolios to images and text produced en masse for wide distribution. Eight are flat sheets and two are books; all except one of the ten objects are printed exclusively in black ink. The images all have a social, economic, or political message, as they are all either part of or similar to objects selected for the *Pressing Politic*s exhibition.

Paper characteristics

The paper supports from the study sample ranged from what appeared to be white cotton rag paper to cream-colored papers of unknown fiber content to those that were quite obviously aged wood pulp papers, given their brittleness and heavy yellow/brown discoloration. Some had somewhat textured to fairly lively surface characteristics with irregular fiber deposition; others were highly uniform and calendered, with little to no surface character. For this study, the sizing was not examined. For those papers on each end of the spectrum, their initial fiber and manufacturing method identifications were essentially borne out in the end, while analysis of the unknown papers in the middle proved to be quite fascinating.

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METHODOLOGY

Visual/microscopic examination

All 10 objects in the sample selection were first examined with both the unaided eye and a Leica WILD M32Z microscope with a Techni-Quip Corp. T-Q/FOI-1 150w fiber optic illuminator. This provided information about the materials and manufacture, for example, determining the printing process and whether the support was hand- or machine-made. The supports were visually and microscopically assessed in normal and raking light to subjectively characterize their color, thickness, and surface texture based on the categories established by the Print Council of America (Lunning 1996). Also noted were any relevant condition issues, printing or papermaking irregularities, the degree of processing, and other unique qualities of the sheet. A Keyance VHS 2000 digital microscope was used for further microscopic examination of the papers' surfaces. This microscope was selected for its 200x magnification and image-capture capabilities.

XRF

X-ray fluorescence (XRF) analysis was performed on all study sample objects. XRF is a nondestructive technique that detects different elements present by directing x-rays at an object and measuring the unique fluorescent x-rays that bounce back. It was used to identify any elements present in the object relating to inorganic paper fillers, ink, pigments, or impurities. The instrument used was an Olympus Delta InnovX in Geochem mode.

MFT

Micro-fade testing (MFT) was undertaken to evaluate the light sensitivity of the objects. The micro-fade tests were carried out with a Tru-Vue Conservation Clear Acrylic filter in the light path to determine the sensitivities of these areas under typical museum lighting conditions—i.e., light with spectral outputs that do not include ultraviolet radiation. The MFT curves obtained from the different areas of the object were compared to those of ISO Blue Wool Standards (CAMEO 2020). The light sensitivity was then determined according to the definitions in table 1 (Michalski 2018).

Light Sensitivity	Fading Rate Without UV	Recommended Exhibition Light Levels
Extremely light sensitive	Faster than BW1	3–5 ftc (30–50 lux)
Very light sensitive	Between BW1 & BW2	5 ftc (50 lux)
Moderately Sensitive	Between BW2 and BW3	5 ftc (50 lux)
Somewhat Sensitive	Between BW3 and BW5	5–10 ftc (50–100 lux)

Table 1. Light sensitivity categories for works of art

Fiber identification

The fiber(s) in each paper support were identified by examining a very small sample with a polarizing light microscope. Only a few fibers are necessary for an effective sample size, and after their removal the sampling location is not noticeable to the unaided eye. In general, fibers were extracted from the supports in the bottom left corner of the verso, with some exceptions: the two books were sampled in the bottom left corner of the (left) page opposite the image, and objects with tears or losses where fibers were already disrupted were sampled in those areas. Under the stereomicroscope, a very small droplet of filtered water was placed on the surface, allowing the fibers to swell locally. Very fine tweezers were used to remove a few fibers from the surface of the support, which were placed on a glass microscope slide. The sampling area was gently burnished down and dried flat. The fibers on the slide were covered with a glass coverslip, and water was fed in between prior to microscopic examination. A Nikon Microphot with a Leica DMC 4500 camera was used in transmission mode, with LasX software used to capture images of the magnified fibers. For further confirmation of fiber type and processing method, Graff's "C Stain" was used to stain the same samples for each object. This microchemical spot test provides information on the lignin content of the fibers by reacting to produce different colors.

RESULTS

The results from XRF, MFT, and fiber identification are listed in tables 2–7.

Object Number	Artist, Title, Date	Elements Detected
M.2003.92.39	Arturo García Bustos, *Campesinos mixes* (ca. 1940)	Ca only in paper areas. Ca, S, and Fe in ink areas
M.2003.92.58	Leopoldo Méndez, *La protesta* (1943)	Si, S, K, Ca, and trace amounts of Fe and Ni in both paper and ink areas
M.2003.92.71	Taller de Gráfica Popular, *Maestro tú estás solo contra …* (1940)	Si, S, Ca, and trace amounts of Ni in both paper and ink areas
M.2003.92.131	Alberto Beltrán, *Lázaro Cárdenas y la guerra de España* (1947)	Si, S, Ca, and trace amounts of Ni in both paper and ink areas
AC1994.156.11	Alfredo Zalce, *Lumber Workers* (1946)	Si, S, Ca, and trace amounts of Ni in both paper and ink areas

Table 2. Elements detected by XRF in the TGP objects

Object Number	Artist, Title, Date	Elements Detected
M.82.288.73f	George Grosz, *The World Made Safe for Democracy* (1919)	Ca only in paper areas. Trace amounts of Fe in ink areas
83.1.28a	Wilhelm Plünnecke, *Untitled (Die Marseillaise)* (1919)	S and Ca in paper areas. S, Ca, and trace amounts of Fe in ink areas
M.82.288.270	Karl Schmidt-Rottluff, *Christus* (1918)	Si, Ca, and Ti in paper areas. High amount of Fe in ink areas
83.1.1	Max Pechstein, et al., *To All Artists! (An alle Künstler!)* (1919)	S, Si, K, Ca, Fe, and Ni in both paper and ink areas
83.1.140f	Conrad Felixmüller, *Dead Comrade* (1919)	S, Si, Ca, and Fe in both paper and ink areas

Table 3. Elements detected by XRF in the Rifkind objects

Object Number	Artist, Title, Date	Blue Wool Standard
M.2003.92.39	Arturo García Bustos, *Campesinos mixes* (ca. 1940)	Paper: BW2-3, moderately light sensitive (100000fc.hrs). Ink: <BW3 somewhat light sensitive.
M.2003.92.58	Leopoldo Méndez, *La protesta* (1943)	Paper: BW2-3, moderately light sensitive (100000fc.hrs). Ink: <BW3 somewhat light sensitive.
M.2003.92.71	Taller de Gráfica Popular, *Maestro tú estás solo contra …* (1940)	Paper: BW2-1, very light sensitive (30000fc.hrs). Ink: BW2-3, moderately light sensitive (100000ftc.hrs)
M.2003.92.131	Alberto Beltrán, *Lázaro Cárdenas y la guerra de España* (1947)	Paper: BW2-1, very light sensitive (30000fc.hrs). Ink: <BW3 somewhat light sensitive
AC1994.156.11	Alfredo Zalce, *Lumber Workers* (1946)	Paper: BW2-1, very light sensitive (30000fc.hrs). Ink: <BW3 somewhat light sensitive

Table 4. MFT results from the TGP objects

Object Number	Artist, Title, Date	Blue Wool Standard
M.82.288.73f	George Grosz, *The World Made Safe for Democracy* (1919)	Paper: BW2-3, moderately light sensitive (100000fc.hrs). Ink: <BW3 somewhat light sensitive.
83.1.28a	Wilhelm Plünnecke, *Untitled (Die Marseillaise)* (1919)	Paper: BW2-1, very light sensitive (30000fc.hrs). Ink: <BW3 somewhat light sensitive
M.82.288.270	Karl Schmidt-Rottluff, *Christus* (1918)	Paper: BW2-1, very light sensitive (30000fc.hrs). Ink: <BW3 somewhat light sensitive
83.1.1	Max Pechstein, et al., *To All Artists! (An alle Künstler!)* (1919)	Paper: BW2-3, moderately light sensitive (100000fc.hrs). Ink: <BW3 somewhat light sensitive.
83.1.140f	Conrad Felixmüller, Dead Comrade (1919)	Paper: BW2-3, moderately light sensitive (100000fc.hrs). Ink: <BW3 somewhat light sensitive.

Table 5. MFT results from the Rifkind objects

Object Number	Artist, Title, Date	Fiber Composition	Observations
M.2003.92.39	Arturo García Bustos, *Campesinos mixes* (ca. 1940)	Cotton	C Stain: bright red, indicating high alpha-cellulose content
M.2003.92.58	Leopoldo Méndez, *La protesta* (1943)	Bleached/processed hardwood fiber (?)	Big chunks of fiber, not well separated into fibrils. C stain: all deep indigo blue thin fibers
M.2003.92.71	Taller de Gráfica Popular, *Maestro tú estás solo contra …* (1940)	Bleached wood	C stain: blue, indicating purified pulp
M.2003.92.131	Alberto Beltrán, *Lázaro Cárdenas y la guerra de España* (1947)	Bleached wood	C stain: mostly red, small amount of blue, indicating mostly bleached wood and some purified pulp
AC1994.156.11	Alfredo Zalce, *Lumber Workers* (1946)	Bleached wood	C stain: mostly bluish, indicating somewhat well processed pulp

Table 6. Fibers present in the TGP objects

Object Number	Artist, Title, Date	Fiber Composition	Observations
M.82.288.73f	George Grosz, *The World Made Safe for Democracy* (1919)	Cotton, some partially processed wood	C stain: lots of red, some blue-to-yellow, indicating mostly alpha-cellulose with some partly processed pulp
83.1.28a	Wilhelm Plünnecke, *Untitled (Die Marseillaise)* (1919)	Unbleached, mechanical wood	C stain: all yellow, indicating high lignin content
M.82.288.270	Karl Schmidt-Rottluff, *Christus* (1918)	Bleached hardwood and wool, some unbleached wood	C stain: mostly blue, some yellow, indicating mostly purified pulp
83.1.1	Max Pechstein, et al., *To All Artists! (An alle Künstler!)* (1919)	Bleached wood	C stain: dark blue, indicating well-processed pulp
83.1.140f	Conrad Felixmüller, *Dead Comrade* (1919)	Bleached wood	C stain: dark blue, indicating well processed pulp

Table 7. Fibers present in the Rifkind objects

DISCUSSION

Materials: paper

When assessing this group of 10 objects as a whole, the most striking result of analysis is that there is much more wood pulp present than initially hypothesized. Unknown papers were presumed to be possibly cotton and wood pulp blends, with some inorganic fillers or bleaching treatments. That many of these objects are composed solely of bleached wood pulp is remarkable—especially given that many of them were used to create "fine art" or collectible prints, not ephemeral ones.

Most of the wood used as paper pulp is softwood, which is abundant and easier to process than hardwood. Some objects do appear to contain vessels, including Leopoldo Méndez's *La protesta* and Karl Schmidt-Rottluff's *Christus*. Softwood is composed of fibers (tracheid cells) and ray cells exclusively, whereas hardwoods are more complicated biological structures that also contain large vessels, their hallmark.

The presence of sulfur in these wood pulp papers indicates sulfite or sulfate (kraft) processing; it is unclear which process was used for each object. XRF analysis does not always detect "lighter" elements like sulfur unless there is a large enough amount of it to do so; the fact that sulfur was detected in all of the papers identified as wood pulp indicates that it likely comes (in large part) from processing and is not just an impurity or part of the chemical composition of an inorganic filler.

While most of the wood pulp papers contain fibers processed with a sulfur-based method, some are only partially processed and still contain high levels of lignin. This may contribute to increased acidity, discoloration, and brittleness of the support over time. One object, Wilhelm Plünnecke's *Untitled (Die Marseillaise)*, contains only mechanically processed wood with a very high amount of lignin; this likely explains why the sheet is brittle and dark brown in color.

Some objects do indeed have blends of pulps, including wood, cotton, and others. One object, Karl Schmidt-Rottluff's *Christus*, has a large amount of wool fibers in the paper matrix (fig. 1). Wool (and other proteinaceous animal fibers) are not common in papers, especially modern papers from the 20th century, and may indicate that papermaking resources were scarce enough to warrant recycling textiles, which included wool fibers.

Materials: inorganic fillers

Many of these papers also appear to contain inorganic fillers, and while the analytical techniques used in this study cannot identify specific minerals or pigments, deductions can be made based on the elements present. Fillers are added to use less pulp and bulk out the sheet, to increase water repellency or the opacity of the sheet, and to buffer the sheet against future acidity, among other reasons. Calcium is common to papers, as divalent calcium ions help cross-link cellulose polymer chains and make the sheet strong. However, calcium can also be found in calcium carbonate (chalk) and calcium sulfate (gypsum), common white pigments and fillers.

Seven out of the 10 sample objects contain silicon, an indication that a clay component was added to the paper, either as

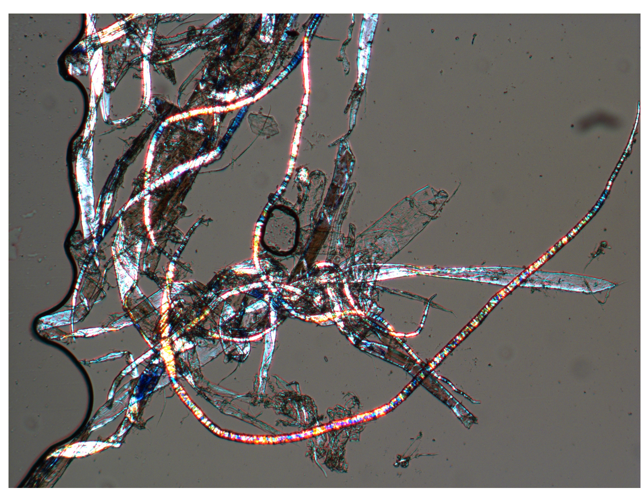

Fig. 1. Polarized light microscope image of Karl Schmidt-Rottluff's *Christus* (1918) with wool fibers visible, 10x magnification. Photo © Museum Associates/LACMA Conservation, by Madison Brockman.

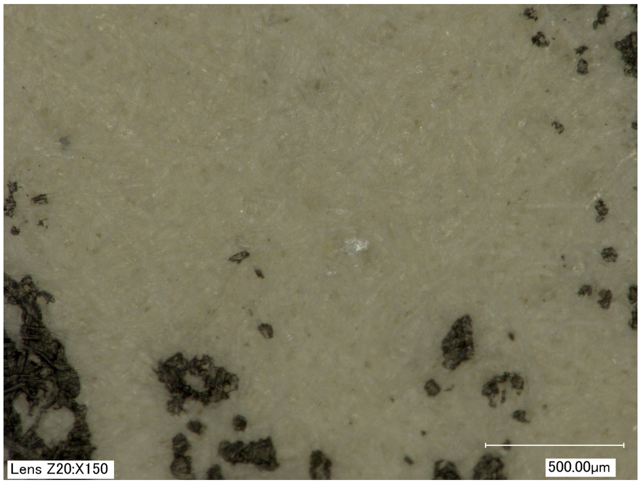

Fig. 2. Digital microscope image of Conrad Felixmüller's *Dead Comrade* (1919) showing a large, shiny, inorganic filler particle on the surface. Photo © Museum Associates/LACMA Conservation, by Laura Maccarelli.

a filler or surface treatment. Silicon is also not always detected by XRF analysis unless the concentration is high enough to be picked up by the instrument, which would be the case if a large amount of clay or silicate mineral is present, like talc (Mg3Si4O10(OH)2). Potassium, iron, and titanium can all be found in various types of micas. Titanium white was not commercially produced in Europe until 1923 (CAMEO 2020), so the titanium present in Karl Schmidt-Rottluff's *Christus* is likely bound up in a natural mineral source given that the artwork was made in 1919.

Some of these objects have such large amounts of inorganic fillers that the surfaces appear to be smooth and characterized by shiny particles embedded in the support, as seen on the surface of *Dead Comrade* (fig. 2). MFT analysis of these objects loaded with inorganic fillers showed that the papers were less light sensitive than other wood pulp papers, on par with the cotton rag papers, likely because there is simply not as much light-sensitive wood pulp in relation to the inorganic fillers that make up the sheets.

The source of the trace amount of nickel in many of these objects is unknown; nickel most commonly relates to art materials in terms of green inks and colorants (Elmas 2018), though that is not relevant to these objects.

Materials: ink

For the most part, the black printing inks in this study sample can safely be characterized as containing carbon-based black pigments. Carbon is too light to be detected by XRF; any other elements detected in qualitatively larger concentrations are likely from the paper substrate beneath the ink.

There may be trace amounts of iron especially as impurities either from naturally forming earth pigments or from manufacturing equipment that may contain iron, though this is less likely in the modern era of pigment and ink manufacture. One alternative explanation to the qualitatively greater presence of iron in the inks is that iron could have been used as a drying agent to accelerate the cross-linking of the oil binder. Cobalt is a more common oil drying additive for fine art materials (printing ink and oil paints), but iron is used in more commercial or industrial products like tung oil.

For *Christus*, the amount of iron present is too great to be an impurity or oil-drying agent; it is most likely that this ink was made with Mars black, an iron-containing black pigment (CAMEO 2020).

For *Lumber Workers*, XRF analysis detected chromium in the red ink, which could indicate the use of chrome red pigment (CAMEO 2020), though no lead was detected. This could be the case if the amount of lead in the pigment itself or in the ink was too small to be detected, as lead is a heavy metal and is usually identified by XRF analysis. Otherwise, the chromium could indicate the presence of another chrome-containing red that does not also contain lead. XRF analysis did not indicate the presence of any pigment-associated elements in the green ink, which may indicate that the ink was made with an organic pigment or dye as the green colorant.

Manufacture

Most supports appear by their even fiber dispersion and smooth surfaces to be machine-made, which goes hand-in-hand with the use of processed wood pulp, and only two appear to be handmade. Leopoldo Méndez's *La protesta* is quite obviously handmade as seen by its irregular fiber deposition and deckle edge (fig. 3), though its processed woody fiber content is an unusual selection for handmade paper. It may be possible that this is another woody plant or grass that was processed like traditional wood pulp, though its exact identity is not confirmed at this time. The other paper that appears to be handmade is George Grosz's *The World Made Safe for Democracy*, printed on a laid paper with a "Drey Könige" watermark and "G. F." countermark visible in transmitted light. For the remainder of the objects, being machine-made is not at all out of the ordinary given that by the 20th century this was the most common means of production for all papermaking, from art papers to commercial papers. For example, Arturo García Bustos' fine art print *Campesinos mixes* is printed on Arches paper, for which there is reliable manufacturer's information indicating that this is a machine-made paper.

Preventive recommendations

Based on MFT analysis and fiber identification, the inks are likely to remain stable while the supports will likely darken and become brittle over time. This is especially the case with wood pulp papers. For those wood pulp papers that are already highly discolored and embrittled, like *Christus*, the change may not be so drastic going forward as much of it has already occurred. For other objects that contain processed wood pulp, more color change may occur with significant

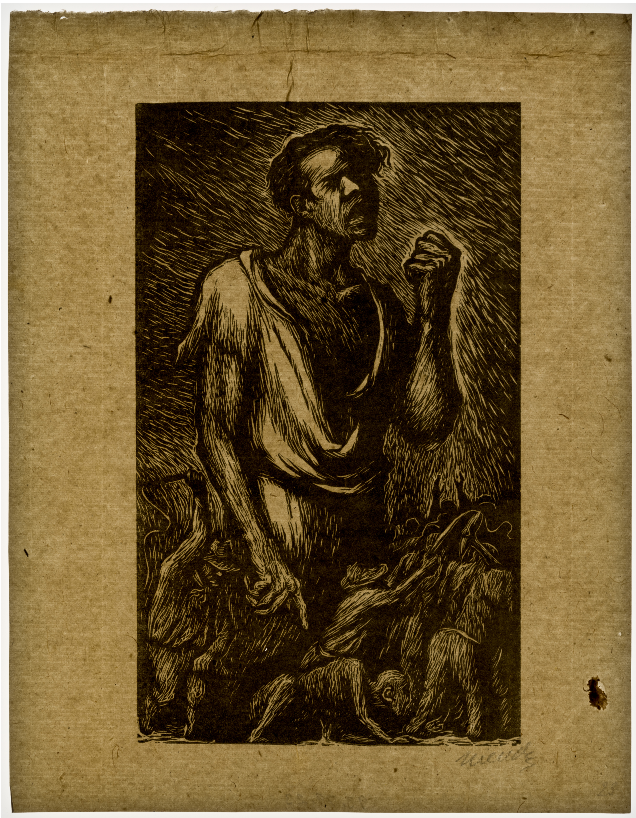

Fig. 3. Transmitted light image of Leopoldo Méndez's *La Protesta* (1943), with deckle edge, unprocessed fiber clumps, and irregular fiber deposition. Photo © Museum Associates/LACMA Conservation, by Yosi Pozeilov.

light exposure in the future. For exhibition light limits, 5 footcandles are suggested with UV filtration. Although these objects will not require relative humidity parameters out of the norm, they should not be kept in a dry environment given their brittleness and should be stored and displayed around 50%–55% RH.

CONCLUSION

This study revealed the materials and manufacturing techniques used to produce previously unidentified papers and unearthed some surprising new information about what materials were either consciously or unconsciously chosen by artists and printers. The use of "nontraditional" commercial, industrial, or recycled materials may indicate an art material shortage or may simply demonstrate a 20th-century shift away from papers previously used in printmaking. Whether this shift was driven by economics or social pressures will be left to the curators to interpret, but simply knowing that these initial hypotheses were largely confirmed changes how these objects are viewed from pure speculation to more substantiated claims.

Armed with the knowledge of these paper supports' composition, paper conservators, curators, and others involved in the care and display of these fragile artworks are better equipped to understand how the objects may change in the future. Further damage can be mitigated through preventive conservation efforts like reducing light levels and exhibition duration, ensuring storage and display materials are acid- and lignin-free, and managing the environment to avoid extreme or fluctuating temperature and relative humidity levels. While these efforts are made to protect all of the works on paper in LACMA's collections, they protect the most vulnerable works—like the prints in this study—most effectively, preventing damage at the molecular level, which often cannot be undone by even the most skilled conservator.

ACKNOWLEDGMENTS

My immense gratitude to Erin Maynes and Rachel Kaplan for initiating this project, for their expertise, and for their collaboration for well over a year. I would like to thank Yosi Pozeilov for his superb documentary imaging of each object in normal, raking, transmitted, and UV light. Many thanks also go to the Mellon Foundation for providing funds for the Fellowship in Paper Conservation I held for the majority of this research project. And finally, I am grateful for the knowledge and support of Janice Schopfer and Soko Furuhata from the LACMA Paper Conservation lab.

APPENDIX 1. VISUAL/MICROSCOPIC EXAMINATION

TGP Objects

1. **M.2003.92.39**

Arturo García Bustos, *Campesinos mixes* (ca. 1940)

Media: linocut – black printing ink on machine-made Arches wove paper

PCA descriptions: cream (3), moderately thick to thick, slightly textured (2)

Observations: The support is a standard fine art printmaking paper from Arches; it is thick, soft, and pliable; has what appears to be a deckle edge; and was made on a wove screen. No shive or inclusions are visible. Based on manufacturer's information, the support is made on a cylinder mold and is likely cotton rag, not sized or only lightly sized for printmaking. The recto is less textured than verso.

2. **M.2003.92.58**

Leopoldo Méndez, *La protesta* (1943)

Media: Woodcut – black printing ink on handmade laid paper

PCA descriptions: cream (3), medium (1) thickness, slightly textured (2)

Observations: The support has an irregular texture on the recto, almost like brushy streaks, which did not come from the papermaking mould. The verso appears to have a more regularly textured surface from the mould screen. There are lots of unprocessed fiber inclusions and shive visible on the support surface and in transmitted light.

3. **M.2003.92.71**
Taller de Gráfica Popular (no artist), *Maestro tú estás solo contra …* (1940)
Media: Lithograph text and linocut image – black printing ink on orange-pink machine-made calendared wove paper
PCA descriptions: orange-pink (no PCA designation), between thin (2) and medium (1) thickness, very smooth texture

Observations: The image is printed on very thin, almost transparent paper that is dyed a peachy-orange color. It has a highly regular fiber deposition on a wove mould screen and is calendered or shiny on the recto and more rough or matte on the verso. There are some small inclusions and shive visible, but not a significant amount present.

4. **M.2003.92.131**
Alberto Beltrán, *Lázaro Cárdenas y la guerra de España* (1947)
Media: linocut – black printing ink on machine-made wove newsprint
PCA descriptions: beige (1), medium (2) thickness, smooth texture

Observations: The support is very flat and has a smooth, regular surface, characteristic of machine-made newsprint. A wove mould screen is visible in transmitted light. There is some shive visible, which is typically very small pieces. The support is fairly brittle and has a rattling sound when manipulated.

5. **AC1994.156.11**
Alfredo Zalce, *Lumber Workers* (1946)
Media: lithograph; black, orange-red, and green printing inks on machine-made wove paper
PCA descriptions: beige (1), between moderately thick and thick, moderately textured (2)

Observations: The support is heavily discolored (yellowed). There is a very small amount of inclusions or shive, though it is mostly a uniform paper without much variation in surface character. The support is almost certainly machine-made given its regular fiber deposition and flat surface character and is likely made from poor quality pulp due to its heavy discoloration. There is some latent foxing on the verso.

Rifkind Objects
6. **M.82.288.73f**
George Grosz, *The World Made Safe for Democracy* (1919)
Media: photolithograph – black printing ink on handmade laid paper (“Drey Könige” watermark and G. F. countermark visible in transmitted light)
PCA descriptions: cream (1), between medium (1) and (2) thickness, moderately textured (2)

Observations: This support is a handmade laid sheet with a deckle edge. It has a nice light color, a small amount of small shive fragments visible, and some colored fiber inclusions. It is moderately textured, soft and flexible, and is somewhat thin and translucent.

7. **83.1.28a**
Wilhelm Plünnecke, *Untitled (Die Marseillaise)* (1919)
Media: lithograph – black printing ink on machine-made thick wove wood pulp paper
PCA descriptions: between beige (2) and brown (no PCA color match), moderately thick, slightly textured (2)

Observations: The support appears very discolored, weak, and brittle; this is typical of an acidic, degraded wood pulp paper. There are many unprocessed wood shive and inclusions visible. The support has a very flat surface without a great deal of topographical character, typical for newsprint and many machine-made papers.

8. **M.82.288.270**
Karl Schmidt-Rottluff, *Christus* (1918)
Media: woodcut – black printing ink on machine-made wove paper
PCA descriptions: cream (3), between medium (2) and moderately thick, slightly textured (2)

Observations: The support seems fairly soft and weak due to its very short fibers. There is numerous very small light brown wood shive visible; the support also has tiny sparkly particles visible on the surface which are likely some sort of inorganic filler.

9. **83.1.1**
Max Pechstein, Cesar Klein, Hans Richter, Lyonel Feininger, Steger and Georg Tappert, *To All Artists! (An alle Künstler!)* (1919)
Media: lithograph (woodcut reproduction) – black printing ink on machine-made clay-coated wove paper
PCA descriptions: cream (3), medium (1) thickness, very smooth texture

Observations: The support is clay-coated and appears very brittle due to the short fibered wood pulp interior. The presence of inorganic fillers is also likely. The surface is very slick and smooth and has lots of unprocessed shive and flecks of shiny particles embedded further in the paper as well.

10. **83.1.140f**
Conrad Felixmüller, *Dead Comrade (in Das Kestnerbuch, after page 52)* (1919)

Media: lithograph – black printing ink on machine-made wove paper

PCA descriptions: beige (1), medium (2) thickness, smooth texture

Observations: The support seems fairly soft and weak due to its very short fibers. There is numerous very small light brown wood shive visible; the support also has tiny sparkly particles that are likely some sort of inorganic filler.

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