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# Conservation of an Oversized Photographic Collage: First Phase

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## ABSTRACT

In January 2012, students in the Post-Graduate Course in Conservation of Photographs at the National School for Conservation in Mexico City, in collaboration with the *Museo Nacional de Historia, Castillo de Chapultepec (National Museum of History)*, started the first phase of a large project: drafting the conservation treatment proposal and exhibition guidelines for an oversized photographic collage measuring 2.5m x 3m (8.2ft x 9.8ft). From ca. 1910–1912, the photographic collage consists of 769 photographs mounted on a secondary paper support lined overall to a cotton fabric and mounted on a wooden stretcher. Due to its complexity the photographic collage is of great technical interest to conservators. It is also of important historical significance for Mexico due to the inclusion of photographic portraits of the most relevant Mexican politicians since the Declaration of Independence in 1810, through 1910.

The first phase of the project focused on the historical and technical aspects of this invaluable piece, including preliminary scientific analysis to help confirm identification of the photographic processes.

## 1. INTRODUCTION

During the first decade of the Twentieth Century, the editor and draftsman Vicente Rivera Melo (1870–1940) created a photographic collage measuring 2.5 m (8.2ft.) high and 3 m (9.8ft.) wide (figure 1). Today this photographic collage is part of the collection of the National Museum of History in Mexico City.

The collage's title is as large as the historical events honored: *Cuadro Geográfico Histórico Cronológico Conmemorativo del Centenario de la Proclamación de la Independencia de los Estados Unidos Mexicanos (Geographical, Historical, Chronological and Commemorative Composition for the Centennial Anniversary of the Mexican United States' Proclamation of Independence)*. It includes 769 photographic portraits mounted on a paper support and decorated with political iconography of the period.

As the name suggests, this collage encompasses different narratives (historical, political and chronological) established with the distribution and organization of portraits of independence heroes and related key actors involved in the development and growth of the Mexican nation from 1810 until 1910. Its aesthetic characteristics are more elaborate and decorative than similar photographic collages made in Mexico during the same period.

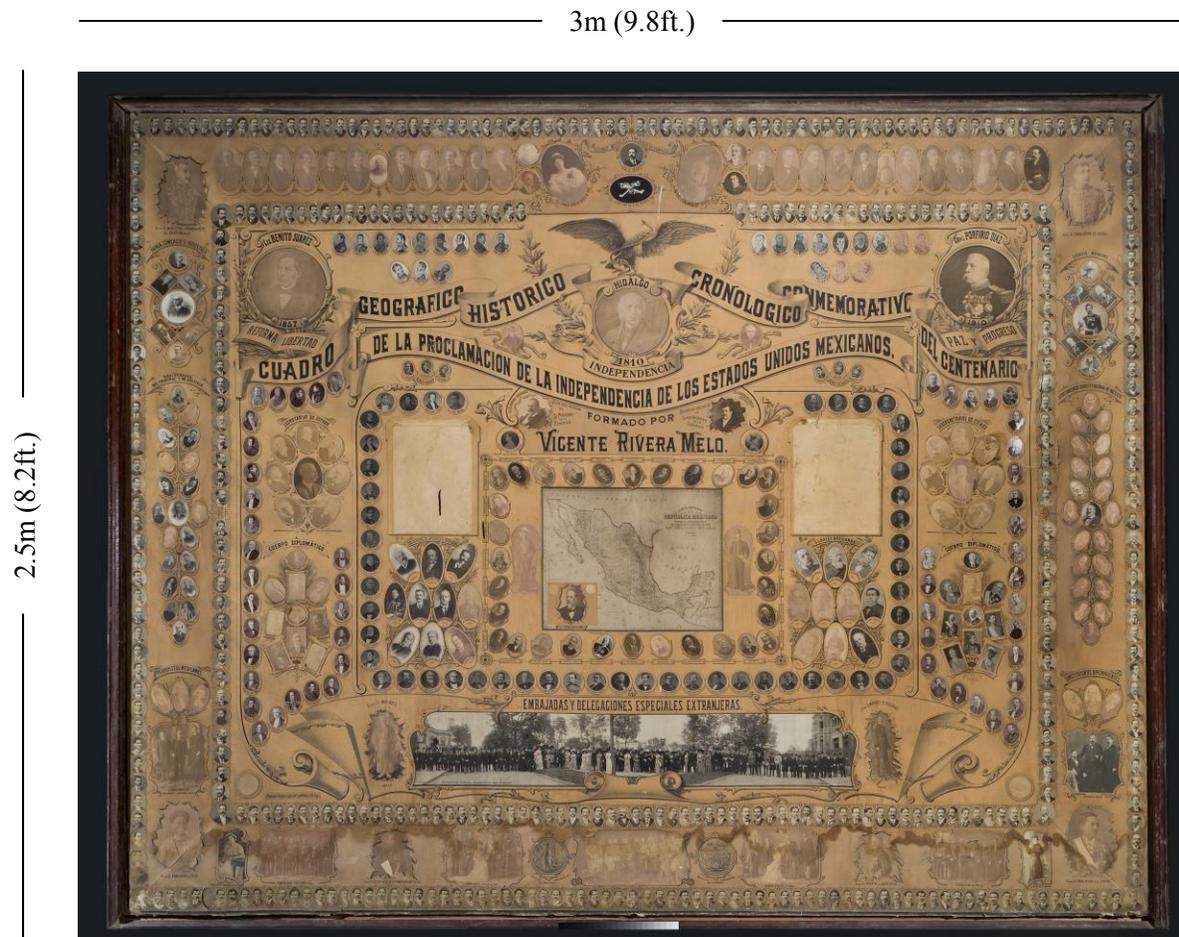


Fig. 1. Overall view of the photographic collage. Photograph courtesy of ENCRyM, ECRF 2011–2012. Reproduction authorized by INAH–CONACULTA–MEX.

In January 2012, students of the Post-Graduate Course in Conservation of Photographs (ECRF) at the National School for Conservation (ENCRyM) in Mexico City, started the conservation project for this remarkable piece. The project focused not only on the conservation treatment of the object but was also used as part of the students' learning process, as you can see in the flowchart below (figure 2). The project was structured in three phases:

- First phase: material identification, scientific analysis, and research on the history of the object as methodological and theoretical approaches.
- Second phase: elaboration of a treatment proposal, based on the analyses and information previously compiled.
- Third phase: conservation treatment and drafting of exhibition guidelines.

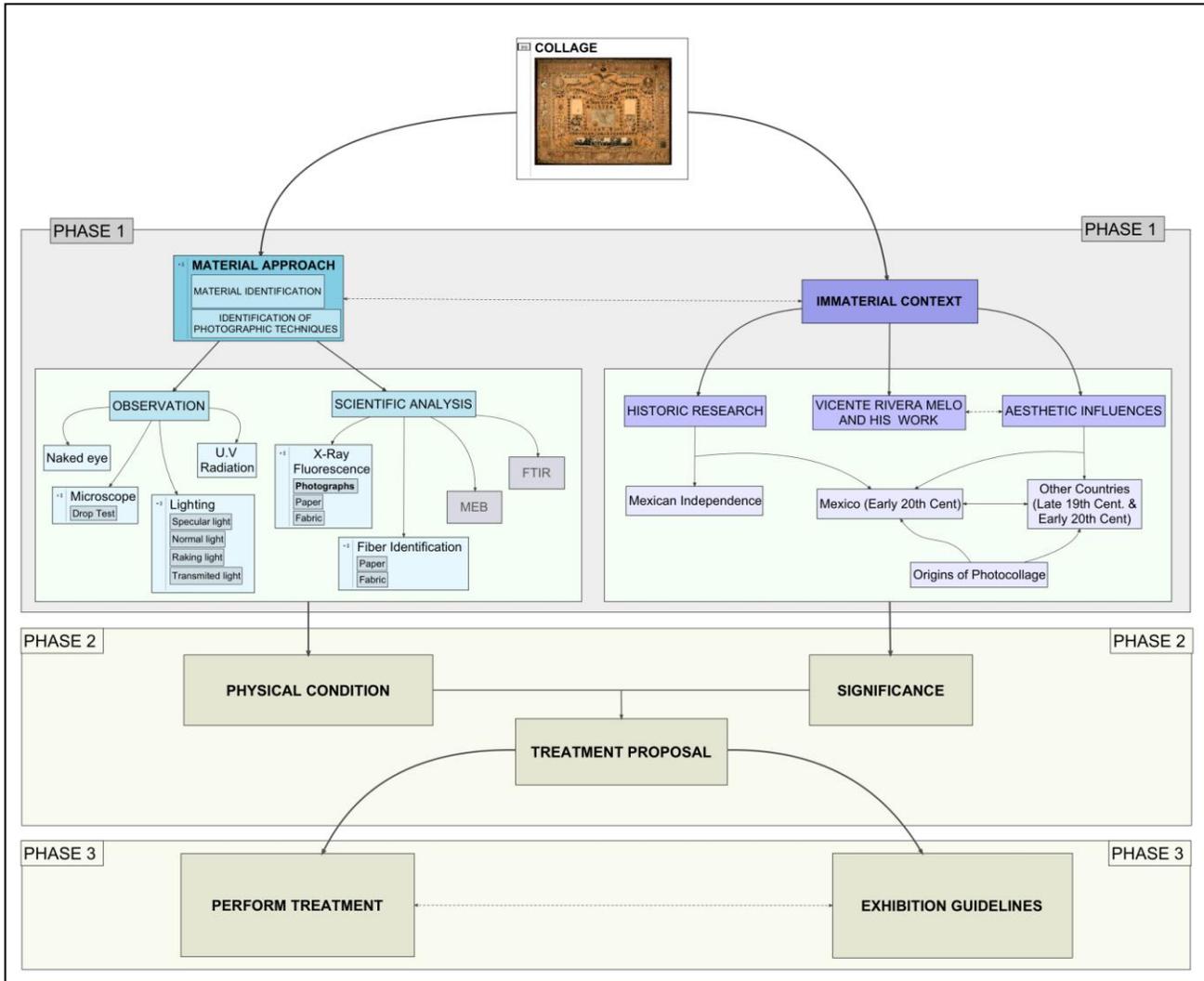


Fig. 2. Flowchart showing the three phases of the project.

Thereby, the results obtained during the first phase of this project will be presented here: the identification of materials and photographic techniques together with the historic research and contextualization of this collage.

## 2. DESCRIPTION

This oversized photo collage was conceived and made by the editor and artist Vicente Rivera Melo, in collaboration with draftsman Espinosa.

A political map of Mexico surrounded by the governors of each state in 1910 sits in the center of the composition (figures 3a and 3b).



Figs. 3a, and 3b. Political map of Mexico in the center of the composition, surrounded by the governors of each state in 1910. Courtesy of ENCRyM, ECRF 2011–2012. Reproduction authorized by INAH–CONACULTA–MEX.

Portraits of the most relevant characters involved in the development of Mexico as a nation since the Declaration of Independence in 1810, until the Independence’s centennial in 1910 are also included.

Vicente Rivera Melo used 769 portraits and organized them in groups, surrounding the map. The most important elements of the composition are:

- The long title in capital letters presented on two flowing ribbons.
- A heavily retouched photograph of the keys to the city of Mexico City.
- The drawing of an eagle with a snake in its beak, which represents the establishment of Mexico City.
- The circular portraits of Benito Juárez, Miguel Hidalgo, and Porfirio Díaz, surrounded by their political achievements (Reformation and Liberty for Juárez, Independence for Hidalgo, and Peace and Progress for Díaz), and smaller portraits of 24 independence heroes.
- The portraits of Leona Vicario and Josefa Ortiz de Domínguez, two women who participated in the independence.
- The Minister of Guatemala and the Ambassadors of Brazil, China and Japan, which emphasize the international relations held by Mexico and therefore its political strength in 1910.
- Figures of the Mexican banking, commerce, and industry.

- Prominent Mexican journalists.
- A panorama showing the members of the foreign embassies and special branches.
- The representatives of the National Commission for the Independence Centennial.
- Two large empty spaces in the upper left and right sides, which were identified during the project.

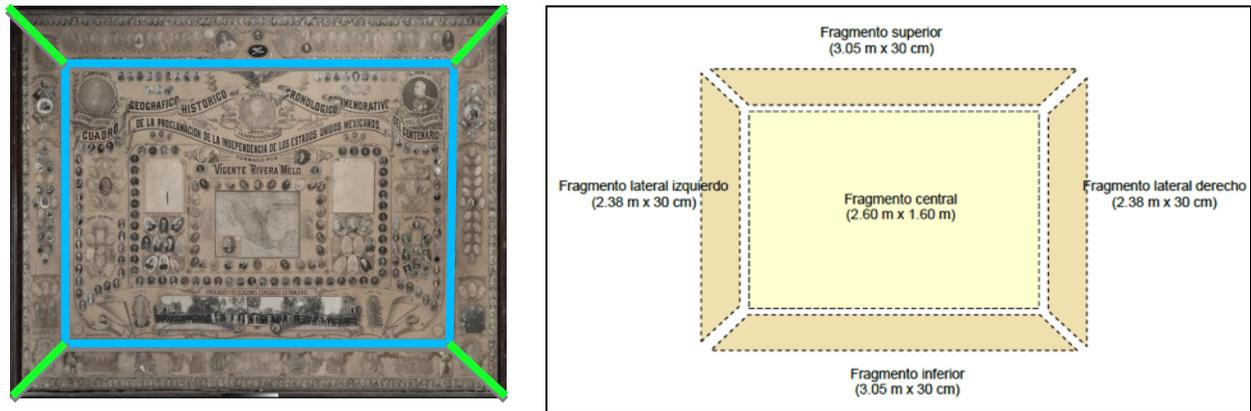
### 3. TECHNIQUE

The construction of this collage started with a plain cotton fabric which supports all the elements and is mounted on a pinewood stretcher using cloves along the edges (figure 4).



Fig. 4. Verso of photographic collage, showing cotton fabric and pinewood stretcher. Courtesy of ENCRyM, ECRF 2011–2012. Reproduction authorized by INAH–CONACULTA–MEX.

The paper support, manufactured by the paper company Schleicher & Schüll, was adhered to the fabric with starch paste and is comprised of five pieces: the largest in the center and four wide strips along the edges. The pieces of paper were probably adhered to the fabric starting from the center, followed by the surrounding papers, with edges aligned and abutted, not overlapping (Figures 5a and 5b).



Figs. 5a and 5b. Diagrams showing the distribution of the five pieces of paper support. Courtesy of ENCRyM, ECRF 2011–2012. Reproduction authorized by INAH–CONACULTA–MEX.

Afterwards, a layout drawing was made using graphite in order to distribute the different elements of the collage, including the flowing ribbons with the title, the eagle, the map, and the groups of portraits with their names. The final drawing was done in black ink over the graphite.

The photographs were then pasted on the paper, following a symmetrical distribution according to the vertical axis that divides the composition in two. This setting also influenced the five shapes that can be found in the photographs, which were identified as: circular, oval, rectangular, mixtilinear and irregular (table 1).

<b>Circular</b>	
<b>Rectangular</b>	
<b>Mixtilinear</b>	<b>Oval</b>
	<b>Irregular</b>
<b>Table 1. Groups of shapes found in the photographic collage.</b>	

The photographs were adhered to the paper support using starch paste. The surrounding areas of some photographs were decorated, using templates or a pair of compasses for the circular shapes.

### 3.1. *Identification Of Photographic Processes*

After understanding the general construction of the collage, the next step was the identification of the photographic processes. Starting with observation under ultraviolet radiation, it was possible to see differences between the fluorescence of gelatin binders (bluish fluorescence), and collodion binders (white–grayish), as seen in figure 6. Very careful and meticulous spot tests and examination under microscope were performed all over the collage in order to identify binders, the presence or absence of baryta, and other technical aspects such as retouching. Out of the 769 photographs, 606 are silver gelatin prints, 158 are semi-gloss collodion prints, 2 are platinum prints, and 3 are halftone photomechanical prints.



Fig. 6. Overall view of the photographic collage under ultraviolet radiation. Photograph courtesy of ENCRyM, ECRF 2011–2012. Reproduction authorized by INAH–CONACULTA–MEX.

Under the naked eye are evident different tonalities in the photographs, after identifying the different photographic techniques it was clear that the variations in the tonalities are due to different steps during processing, especially the use of toners. XRF analysis was used to confirm the image forming material.

The photographs' texture is determined by the thickness of the baryta and the binder. As expected, platinum prints have a matte surface due to the absence of baryta and binder, collodion prints and some silver gelatin prints have semi-gloss surfaces, in most of the cases the gelatin

prints are more glossy than the collodion ones. It was noticed that the collodion prints have an uncommon faded appearance.

3.2. Analysis With X-Ray Fluorescence (XRF)

The XRF analysis confirmed the absence of baryta and the presence of platinum as well as some mercury in the platinotypes. The presence of baryta in the collodion prints was also confirmed, even when it was so thin that it was barely visible under the microscope.

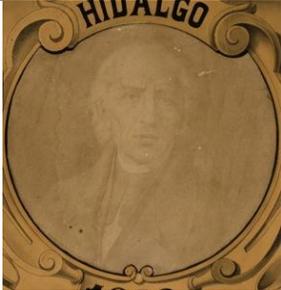
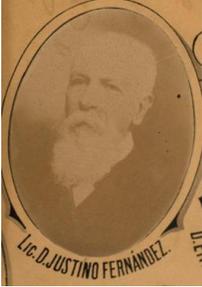
In the silver gelatin photographs, the presence of gold, sulphur, and platinum was detected as toning elements. The collodion prints also showed gold and platinum as part of the image layer, which was unexpected due to the strong fading of the images.

So the question arises: why are the collodion prints showing such a strong fading compared with the silver gelatin prints?

The first possible explanation would be poor processing, as well as the thinness of the collodion.

In order to better understand this deterioration, further examination was carried out in three steps:

1. Collodion prints were groups by tonalities (see table 2):
  - a. Warm: images show a good condition with details in the highlights and good contrast.
  - b. Warm faded: highlights, contrast, and image density are strongly faded.
  - c. Pink: photographs display a slight fading, and details in highlights are mostly lost.
  - d. Pink faded: highlights are faded.
  - e. Sepia faded: in general these images have different levels of strong fading; in some photographs the image is almost completely lost.

 <p>a. Warm.</p>	 <p>b. Warm faded.</p>
 <p>c. Pink.</p>	 <p>d. Pink faded.</p>
 <p>Sepia faded.</p>	
<p>Table 2. Examples of tonalities and fading levels established for collodion prints in the photo-collage. Courtesy of ENCRyM, ECRF 2011–2012. Reproduction authorized by INAH.</p>	

2. On each group, a series of XRF analysis were performed in order to identify the image forming material. The equipment used was a Bruker Tracer III-V Handheld XRF with a Rhodium tube target and aperture of 1cm, Aluminum/Titanium filter, air atmosphere, tube voltage of 40KV, tube current: 1.10 mA, and livetime between 180 and 300 seconds. Once the elements present in the image layer were identified, the ARTAX software was used to generate a semi quantitative approach to said elements.
3. Interpretation of results and relate this information with the condition of the collodion prints.

The comparison of the XRF analysis made on each group allowed us to obtain the following results: silver, gold and platinum were found in groups *a*, *b*, *c*, and *d*, while only silver and gold were found in group *e*.

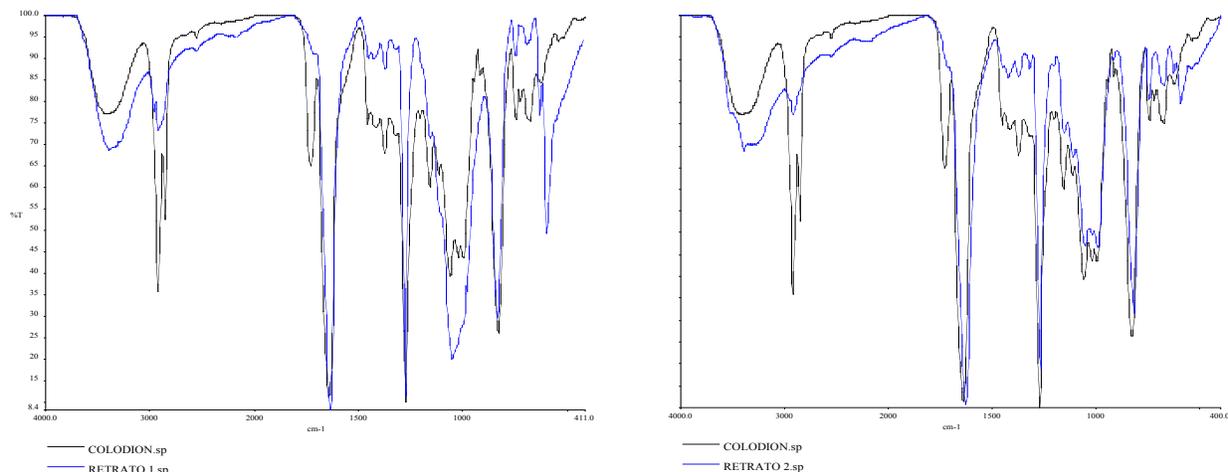
	<p style="text-align: center;"><b>Warm Tonality (average)</b></p>
<p>Fig. 7. A comparison of the amounts of silver, gold, and platinum found in the areas of high image density within sample group <i>a</i> using quantitative XRF. (x-axis, samples; y-axis, counts)</p>	<p>Fig. 8. Average quantities (counts) of silver, gold, and platinum detected in all of the photographs within sample group <i>a</i>. Photographs in sample group <i>a</i> contain a significantly more platinum than gold.</p>
	<p style="text-align: center;"><b>Pink Tonality (average)</b></p>
<p>Fig. 9. A comparison of the amounts of silver, gold, and platinum found in the areas of high image density within sample group <i>C</i> using quantitative XRF. (x-axis, samples; y-axis, counts)</p>	<p>Fig. 10. Average quantities (counts) of silver, gold, and platinum detected in all of the photographs within sample group <i>c</i>. Photographs in sample group <i>c</i> contain a greater amount of silver and less gold and platinum than those in sample group <i>a</i>.</p>

So even when there is gold and platinum in most of the images, reddish and yellowish tonalities could have resulted from poor processing during toning, or if the temperature, the purity and/or concentration of toners was not the appropriate.

Further analysis will be performed as an attempt to quantify more accurately the quantity of silver, gold, and platinum in each group. For this, more XRF measurements will be done with a different protocol in order to establish statistical data and using a logarithmic scale to get accurate quantitative information.

If possible, other analyses will be used to try to identify traces of pollutants, which could be related with fading, but also affect the stability of the prints and possibly of the other photographic processes present in the collage.

FTIR was used to analyze the collodion binder, in order to confirm its nature. With the help of chemist Marisela Gutiérrez, from the *National University of Mexico* (UNAM), it was possible to confirm the basic structure of cellulose nitrate by comparing the spectrums obtained from photographs in the collage with some reference samples of nitrate cellulose from the UNAM database and from the Infrared and Raman Users Group (IRUG) (figures 11a and 11b).



Figs. 11a, and 11b. In blue, two FTIR spectrums of collodion prints from the photo-collage. In black, FTIR spectrum of a sample of collodion (cellulose nitrate) from UMAN reference database. The peaks coincide around 1650, 1280, 1000 and 845, confirming the basic structure of cellulose nitrate.

#### 4. HISTORIC RESEARCH

The history of the collage can also gave us some clues about its condition. As mentioned earlier, the creator of the collage, Vicente Rivera Melo was an editor and draftsman, not a photographer. So he obtained the photographs from different sources:

1. He invited legislators to have their pictures taken in a photographic studio in Mexico City. Or, as in the case of the panorama, a photographer and its company were hired to produce the image.
2. He had access to famous portraits taken years before by different photographic studios, such as the images produced by the studio *Cruces y Campa* in 1874, used to commemorate the heroes of Mexican Independence from 1810 through 1874. According

to the author Olivier Debroise (1994), the production of these portraits was well received and quickly became popular, so the initiative was followed by other studios established in the city that started selling images of renowned people of the time including deputies, senators, writers, and so on.

According to author De los Reyes (2002), the tradition of commemorative photographic portraits in Mexico can be traced to 1864, when photographic portraits of the Emperor of Mexico Maximilian 1st and his wife Empress Carlota, were sent and sold in Mexico as a way to introduce the new Emperors to the people. Also, the *carte de visite* and family albums were a common practice among wealthy families. So it is possible that, in a way, some of the Victorian tradition of photo-collages had come to Mexico through the Emperors, especially through Empress Carlota who was also cousin of Queen Victoria of the United Kingdom.

According to Elizabeth Siegel in her book *Playing with Pictures*, in the Victorian photographic collages there was an intention of showing an aesthetic taste but also a way to consolidate relationships and networking, but also to show their recognition and position in society (Siegel 2009), which is very similar to some characteristics of this collage: the author was trying to emphasize the figure of president Porfirio Díaz by equating him with the most important figures in Mexican history such as Benito Juárez, who defeated the *French Intervention* in Mexico, and Miguel Hidalgo, one of the main leaders of Mexican independence. In fact Díaz is the only character that appears several times in this photographic collage.

Making photographic collages was also a common practice among many photographic studios. The oldest Mexican collage we have found so far dated 1879; although earlier collages were usually governmental projects assigned directly to the photographic studios where lithographic prints were used as background and usually combined with photographs in a single collage. The Mexican patriotic symbols are recurrent in these collages, including the eagle holding a ribbon in its grips and/or a snake in the beak, military symbols, flags, vine and olive branches, among others. Rivera Melo used all these elements, but he arranged them in a more elaborate composition articulated with a political and historic intention.

The historic research was carried out in different photographic archives, libraries, and electronic media, and lead to the discovery of other versions and early photographic documentation of this photo-collage. Perhaps the most important find is the glass plate negative found in the *National Photographic Archive–INAH* in the city of Pachuca, belonging to the Casasola collection. The plate shows an approximate condition of the images in the photo-collage years ago, as well as the missing elements in the blank areas next to the map: two photographs, the one at the left shows Francisco Gonzalez Bocanegra, the writer of the National Anthem lyrics; and at the right is Jaime Nunó, the melody composer.

Finally, it was possible to contact and interview one of Mr Rivera Melo's grandson, Doctor Vicente Rivera Melo Vázquez, who remembers seeing this collage at his grandfather's house. Dr. Rivera Melo Vázquez also provided information about his grandfather's artistic training and background as lawyer.

According to the acquisition records of the National Museum of History (MNH), reveal that after Mr. Rivera Melo death, his son Joaquín Rivera Melo tried to sell this photo-collage to the Museum, for the amount of one thousand pesos of the time, but the transaction wasn't possible and Mr. Joaquín decided to donate the photo-collage to the Museum on November 23, 1942 (Archivo MNH, 1942), and since 1944 the collage is part of the collections of the National Museum of History.

## 5. CONCLUSIONS

The celebrations for the Centennial were intended to be the most important political and social events in 1910. This Commemorative Photographic Collage shows a synthesis of those intentions by organizing and distributing portraits of the most influential Mexican politicians together with diplomats and ambassadors of different countries, bankers, and journalists, and placing them next to historical figures that contributed to the building of the Mexican nation a hundred years before, and those who continued such efforts until 1910, right before the Mexican Revolution.

The historic approach to this oeuvre allowed us to discover more photographic collages from the same author, as well as discover the images that once filled the empty spaces in the center of the collage. Further research could increase the knowledge about the techniques used by Rivera Melo.

Thanks to the generous help of Vicente Rivera Melo's grandson, Dr. Vicente Rivera Melo Vázquez, it was possible to find the institutions where his work still remains, and better understand Rivera Melo's work.

Close examination and elemental analysis allowed us to identify and locate the different photographic processes present in the photo-collage. The XRF analysis and related software, allowed us to make a semi-quantitative approach to the elements present in the photographs. In this case we could say that having a small quantity of gold and platinum means more faded images, while larger quantities of toning materials mean more image stability. However, it doesn't explain why the collodion prints show such strong fading. Further analysis should be done to better understand this behavior. Some analyses that has been considered are:

- SEM: to explore the physical characteristics of the collodion binder such as the thickness, together with the analysis of the image materials.
- More XRF readings in order to get a statistical approach, as an attempt to better quantify the elements present on each group of photographs and co-relate this information with other analytical techniques.

Finally, we should mention that the second phase has already started and important treatment challenges are approaching.

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