

# Transforming a glass negative collection into a digital asset through collaborative effort

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## Vicki Sipe

is the Catalog Librarian at the Albin O. Kuhn Library & Gallery of the University of Maryland, Baltimore County. Over the past 20 years she has catalogued a variety of materials, including photograph collections. Among her many training sessions, presentations and workshops, her recent focus has been on the provision of metadata for images.

Albin O. Kuhn Library and Gallery, University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250, USA

Tel: +001 410 455 6751; E-mail: sipe@umbc.edu

**Abstract** The Hughes Company Glass Negatives Collection is one of the many notable image collections held by Special Collections at the Albin O. Kuhn Library & Gallery of the University of Maryland, Baltimore County. In an effort to provide public access to this set of large-format glass negatives, Special Collections and the Bibliographic and Metadata Services units worked in collaboration on an in-house project to digitise, describe and serve the images and metadata to the public via a digital content management system. The project utilised existing staff with some additional hiring of student workers and required three years to complete. This paper describes the collection, the digitisation process and the creation of the metadata records representing the images.

**KEYWORDS:** collaboration, digitisation, workflows, metadata creation

## THE COLLECTION AND PROJECT

The Hughes Company Glass Negatives Collection housed at the Albin O. Kuhn Library & Gallery of the University of Maryland, Baltimore County consists of images taken by the Hughes Company in and around Baltimore from about 1905 to 1940. The Hughes Company was a commercial photography business active in Baltimore, Maryland for about 100 years. Founded by James F. Hughes (d. ca. 1903), who is first listed as a photographer in Baltimore in 1877, the business closed its doors in the late 1970s. The photographs and negatives taken by the company were donated to several Baltimore institutions, including UMBC. Materials donated to UMBC consisted of about 3,000

8 × 10-inch glass negatives. Information about the individual negatives varies. About 25 per cent of the negatives came from the donor with handwritten captions on the paper sleeves that housed the negatives. In the 1970s, Special Collections staff and volunteers re-sleeved the negatives. The original captions were transcribed and descriptive captions were added to many of the sleeves by the staff and volunteers. At the time of this project, every sleeve had some information written on it, but whether the captions were transcribed originals or provided in the 1970s could not be determined. On a few, information is written on the negative itself. For all of the negatives, it is known that they were taken by the Hughes



**Figure 1:** Bridal portrait of Mrs Mary Johnston and her flower girl

Company between 1905 and 1940, generally in Baltimore, Maryland. The collection is housed within the Special Collections unit of the library.

The collection includes images falling roughly into groups of people, places and things taken in and around Baltimore during the period 1905–1940. As a commercial photography business, many of the images are almost documentary in nature. One of the larger groupings of images is that of portraits, both group and individual. Some are identified by the name of the individual or the group, some have specific dates, but many are without any identification. Among these is a bridal portrait of Mrs Mary Johnston and her flower girl (see Figure 1). There are also many portraits of enlisted men and officers in First World War uniforms, some with names. Another large group of images

consists of cityscapes and individual buildings, as well as monuments. There are also many images of various types of machinery. There are some agricultural machines and many machines used in manufacturing processes. Some are identified if not by type of machine, perhaps by the company either using or making the machine (see, for example, Figure 2). Often, there is no identification whatsoever of the machinery. This group became the subject of much mid-afternoon coffee-break speculation by project team members. How might the various belts, chains, levers and cogs interact? What might the machinery do?

The project discussed herein to digitise, describe and provide access to this collection included several phases of work and spanned several years. Initial conversations between the Special Collections and Bibliographic and Metadata Services (BMS) units in the library established the interest of both in undertaking such a project. This led to follow-up conversations ranging from the division of labour to the specific fields to be included in a record meant to represent an image. Once these decisions were made, work began on writing procedures and training the staff. Digitising preceded the descriptive work in the overall workflow, with the descriptive work based on the scans of negatives, rather than the actual negatives. It was much safer and more effective to move the digital surrogates between units than the physical items. Subjecting the nearly 100-year-old 8 × 10-inch glass plates to as little handling as possible was a primary concern among all involved in the project. Some negatives in the collection were excluded from the project. These included those too heavily damaged to provide an image and images of the work of others, such as oil paintings, maps and pages from books. In total, 2,671 negatives were digitised, the scans processed to positives, descriptive



**Figure 2:** Rain gauge made by Julien P. Friez & Sons

work completed and both scans and metadata uploaded to the digital content management platform that is accessible to the public via the University's Digital Collections webpage (<http://contentdm.ad.umbc.edu/>). The project, from first meetings between Special Collections and BMS through to the taking of the collection live, spanned three years and was handled entirely with existing staff. Some additional student workers were hired to assist with the scanning of negatives.

### **UNIQUENESS OF COLLECTION – OR WHY THIS COLLECTION?**

Digitisation is an expensive, labour-intensive, time intensive, expertise intensive project. Therefore, a decision to digitise a collection requires that several

thresholds be met.<sup>1</sup> Many insist, and with good reason, that the decision-making begins with copyright considerations. If the institution does not hold free and clear copyright, the investment in digitisation should probably not be made. Among other prime considerations would be the intellectual quality of the material. Often, the goal of digitisation is to push content out to the web. This broadens access to materials in a profound way. There is not just an increase in access, but a changed nature of access. Some materials might otherwise not be available to the public at all due to their fragile condition. Enhancements offered by digitisation such as a zoom tool might increase the value and usability of the materials. The materials need to be worthy of the exposure; they need to make a real contribution to the broader research community. Along with high intellectual quality, the uniqueness of a collection should also be considered. There might be donor or other considerations but, generally, why make the investment in digitising materials already made accessible by another institution?

In this context, several characteristics of the Hughes collection made this project attractive. UMBC holds ownership rights to these unique items. In addition, this collection is very strong in local and public history. The images document buildings and neighbourhoods that in some cases no longer exist. The images themselves are of good quality. They are generally clear, well-exposed negatives with a good range of tonal quality. By virtue of being 8 × 10-inch glass negatives, the images contain a wealth of detail, enhancing the value. As these are negatives, they are by their very nature unique. Large glass negatives are delicate and some of these are deteriorating. Digitising the images was one of the few ways to allow public access to the collection and the digital surrogate ensures

access to the images regardless of further deterioration of the negatives. Additionally, negatives are difficult to read. Processing negatives to positives as part of the digitisation process made the images readable and increased their usability. Finally, the limited scope and size of the collection proved attractive to decision makers. It was large enough for an experiment, but small enough to be within reach of current resources — primarily money, server space and staff time. Expertise in the handling of delicate materials and the description of images existed in-house, although it was not widespread. This allowed for the in-house training of current staff, rather than the hiring of additional staff. Existing equipment could be utilised in new ways. All in all, this was an opportunity to expose a truly hidden gem of a collection.

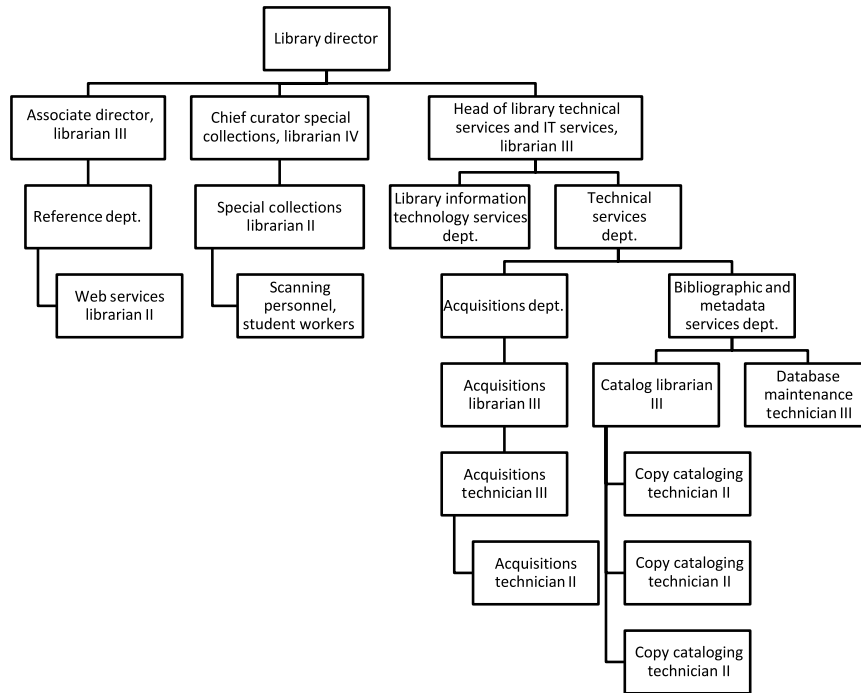
## COLLABORATION

In a collaboration, each partner brings their own skills, tools and gifts to the table. This allows the sharing of expertise and a division of labour that can free up resources for additional projects for each of the partners. Hopefully, some expansion of expertise can also result from the project. The collaboration described in the present paper was primarily between two departments of the library: Special Collections and BMS. Besides being the repository and steward for the collection, Special Collections contributed tools and skills to the project such as familiarity with the materials, expertise in handling fragile materials, equipment for scanning, expertise in scanning and student staff to perform the scanning. Among the contributions from BMS were expertise in working with resource description, expertise in working with images, equipment for distributed work, expertise with controlled vocabularies and additional student staff to assist with

scanning. BMS has a long history of working with Special Collections and the Hughes project built on that relationship. Both departments brought a willingness to work together, without which the project would never have got off the ground.

Individuals from other departments were called in as needed to deal with specific issues. Especially important were the personnel from Library Information and Technology Services (LITS). Among other responsibilities, this department manages the library's computing and technology resources and the relationship of the library with the campus information and technology office. LITS personnel assisted this project with initial software and file storage set-up. They also provided additional technical support as needed. As with most software, 'special features' might appear after developer updates. Several of these required the expertise of in-house technical personnel to resolve. Without this occasional, but necessary support, the entire project could be stopped in its tracks. The Web Services Librarian, a member of the Reference Department, worked with the Special Collections staff to develop and customise web pages for the public interface of the collection. Figure 3 provides a simplified organisation chart for the library showing the departments that participated in the project.

In initial discussions, a natural division of labour seemed to be for Special Collections to handle and scan the negatives, do the initial loading of records and images into the digital content management platform and initial quality control. This utilised many of their existing competencies. A Special Collections Librarian managed this overall workflow for the department and developed procedures as well as trained student workers on the scanning of the glass negatives. Earlier projects had involved these staff in the scanning of images; however, this was the first experience in



**Figure 3:** Library organisation chart

the scanning of glass negatives. Over the course of the project, 13 student workers scanned negatives. Five of these students were lent by other departments to assist: three from BMS; two from Acquisitions. There was a single scanner available for the project and the Special Collections librarian managed the scheduling of these workers to perform the scanning. Scanning required an average of ten minutes per scan for 2,671 scans totalling 445 hours of scanning time. Individual scanning sessions were scheduled as other duties allowed and individual work schedules permitted. As the workers were students, the availability of time was somewhat variable and dependent on the cycles of the academic calendar. Very little scanning might be done during finals week, as an example. Some workers spent as little as three hours scanning, while the maximum amount of time for an individual was 71 hours. Scanning took place over about 13 months.

A team in Technical Services, composed of three copy cataloguing technicians, one

acquisition technician, one database maintenance technician and the Catalogue Librarian, focused on the descriptive work for the images. The Catalogue Librarian managed this team, developed procedures and trained staff to provide the descriptions. Although all members of the team were members of Technical Services, there were three different supervisors represented within the group (see Figure 3). The Catalogue Librarian supervised the three copy cataloguing technicians. The Acquisitions Technician was supervised by a higher-level acquisitions technician who reported to the Acquisitions Librarian. The Database Maintenance Technician was supervised by the Head of Technical Services. Despite this mix of reporting chains, each member of the team was responsible to the Catalogue Librarian for the work done on this project. As it turned out, workloads within the Acquisitions department increased and that staff person was withdrawn from the project shortly after training, bringing the team entirely within BMS.

The staff had experience with bibliographic description standards, controlled vocabularies and name authority files. This experience was primarily with Library of Congress tools in the library utilised MARC data structure environment. Expertise in image work and non-MARC environments existed in the department, but was not widespread. This meant training was needed, both on image and metadata work, but could be done within the department by the Catalogue Librarian. In addition, all the staff involved in the project had access to individual workstations, networked throughout the department. This allowed the creation of shared project files within the digital management software platform. The digital assets, scans and metadata records, could be added to the working files of each member of the team, while at the same time be available to the Catalogue Librarian for viewing and review. The sharing of projects greatly enhanced the ability to address questions, offer assistance and monitor progress.

Each member of the team spent time on descriptive work as other duties allowed. During the initial training period, individuals were encouraged to work on at least ten images per week. This pace picked up as individuals developed facility with the new software and new tasks. Additionally, time required per image for descriptive work could be highly variable. Where there was no information available, an image might require five minutes work. Where an image included information, it required verification, and more time. These details are discussed more fully below. An overall estimate of time required could sit at 30 minutes per image for 2,671 images = 80,130 minutes = 1,335.5 hours over about 29 months. Staff worked on this project as other duties allowed, meaning that the number of people working on the project per week and the

amount of time spent by each of them varied considerably. During a particularly slow period for other work, four technicians spent ten hours per week over five months providing image descriptions. During this period, 1,600 descriptions were completed. This represented a high point of focused activity for the project.

### **SPECIAL COLLECTIONS CONTRIBUTION**

The Special Collections Librarian managing this project for the department developed procedures and trained student workers on the scanning of the glass negatives. An Epson Expression 10000XL flatbed scanner with the transparency unit was used for the scanning. Each negative is individually housed in a paper sleeve, requiring that the negative be removed from the sleeve for scanning. Procedures included several cautions and directions on the handling of the negatives. Staff who scanned negatives wore nitrile gloves and the scanner bed was cleaned prior to setting a negative on the bed. A physical inspection was conducted of each negative while transferring it from the sleeve to the scanner bed and notes were made regarding the condition of a negative. Care was taken to place negatives emulsion-side up on the scanner bed to ensure a proper left to right orientation. A negative scanned with emulsion-side down resulted in a reversed mirror image of the image intended by the photographer. Each scan was made with 16-bit greyscale colour space setting, at 800 pixels per inch resolution and averaged about ten minutes. Using SilverFast Ai software (SilverFast v6.6.Or1), the highlights and shadows were set for each scan. Scans were opened in Photoshop (CS2) and checked for noise and distortion before proceeding. Images were rotated to correct orientation and cropped to remove non-image areas as needed. Scans were saved as TIFF files.

**Table 1:** Portion of metadata record showing default field values

Field name	Value
Title	Title
Photographer	Hughes Company
Measurement	8 × 10 inches
Collection	The Hughes Company Glass Negatives Collection
Credit line	The Photography Collections, University of Maryland, Baltimore County
Digital resolution	800 pixels per inch
Digital bit depth	16 bits per sample
Color space	Greyscale

While the negative was being scanned, information concerning the individual negative was entered into an Excel spreadsheet for later bulk loading into the digital content management software, ContentDM. This software allows for the bulk loading of metadata from a spreadsheet along with the corresponding image scans. Several legacy collections had been successfully migrated by the Special Collections staff to this platform prior to this project via the bulk loading process. As a consequence, familiarity with the process and confidence in the methodology on the part of Special Collections staff was high. The spreadsheet headings corresponded to the metadata fields of the record template created in ContentDM. Data entered into the spreadsheet included an accession number assigned by Special Collections to the negative and used in the file name of the scan. This served as a match point between the record and the scan. Information from the sleeve itself such as dates and captions were transcribed from the sleeve into the spreadsheet. No attempt was made at this point to verify the information from the sleeve. Notes made on the physical condition of the negative were recorded, eg glass cracked, emulsion peeling, slight fading. Technical metadata such as the digital file creator, date digitised and digital file name were also recorded in the spreadsheet as a negative was scanned.

When the scanning and initial data entry into the spreadsheet was completed

for a group of negatives, the scans and spreadsheet were checked by the Special Collections Librarian. At this point, particular attention could be paid to the quality and orientation of the scan, with a timely rescan very easy to accomplish. Once this step of quality control was completed, the batch of scans and records was uploaded to the digital content management platform. The record template created in this software added default values upon upload of the records for administrative metadata fields concerning technical information and rights management, as well as some descriptive fields (see Table 1). As all the scans shared the same resolution and colour space settings, the file size and other technical metadata describing the image file were supplied as default values. All records also contained the same rights statement, credit line and repository name. Within the descriptive portions of the record, a statement concerning the processing of the digital files was included in each record: 'Positive digital file processed from original glass negative'. Several fields concerning the physical characteristics of the original negatives were also supplied as default values. All of the negatives measured 8 × 10 inches, represented black and white photographs and, of course, all were negatives or 'gelatine dry-plate negatives' to be more precise. The Hughes Company was identified as the photographer for all of the images in the collection. After the bulk

**Table 2:** Portion of metadata record showing descriptive work

Field name	Value
Title	Wells and McComas Monument
Description	East Monument Street and Aisquith, Baltimore. Commemorates two US soldiers who fell during the Battle of North Point, Maryland, 12th September, 1814 — Daniel Wells and Henry McComas
Location	United States — Maryland — Baltimore
Subject names (local)	Wells and McComas Monument (Baltimore, Md) Wells, Daniel McComas, Henry
Subject (TGM)	Monuments & memorials Cityscapes
Subject (LCSH)	North Point, Battle of, Md, 1814

loading, the collection was available to BMS for descriptive work.

### BIBLIOGRAPHIC AND METADATA SERVICES CONTRIBUTION

Researchers and institutions recognise subject access as important tools for the retrieval of materials.<sup>1</sup> Cataloguers have experience analysing subjects of resources as well as an understanding of the importance of controlled vocabularies in enhancing search capabilities. This confluence of factors uniquely qualifies cataloguers for the task of providing descriptive metadata for images. In fact, the provision of descriptive metadata to improve the discovery of a resource is a central focus for traditional cataloguing. A bibliographic record created by a cataloguer provides several types of access points, or metadata, to aid in retrieval. Metadata related to the subject matter of the resource have been mentioned. The identification of related individuals, companies or institutions, events and locations were also recorded in the record.

In providing descriptive metadata for the Hughes Collection, BMS staff constructed a title and contributed both free text and controlled vocabulary terms in several other data fields. As an example, in a record created for a monument located in Baltimore, the title ‘Wells and

McComas Monument’ was provided. This title was based on information included in a caption on the paper sleeve, recorded by Special Collections staff in the spreadsheet at the time of scanning, verified by BMS staff as actually being an image of the Wells and McComas monument and entered into the record as a title. In verifying existence of the monument, the location of the monument at the corner of East Monument Street and Aisquith in Baltimore was discovered. This information was added to the record in a free-text description field. Additionally, it was discovered that the monument commemorates US soldiers Daniel Wells and Henry McComas, who fought and fell at the Battle of North Point, Maryland on 12th September, 1814. This information was also included in the description field (see Table 2).

The location of the monument in Baltimore, Maryland was recorded in a controlled vocabulary field based on the Library of Congress Subject Headings (LCSH)<sup>2</sup> as ‘United States — Maryland — Baltimore’. This form of descending hierarchy allows for a browse display of location information that groups similar headings at each level of the hierarchy. All locations within the USA display together, all locations within Maryland display together and, finally, all locations within Baltimore display together. Due to the



local history interest in this collection, all personal and corporate names related to an image were very important for the project. Names related to images were checked against several tools and entered in controlled vocabulary in several fields. First, names were searched against records already entered for the Hughes Collection. If the name was found in the database, it was recorded in the newer record in the same fashion. Names were also searched in the Library of Congress Name Authority File (LCNAF) for a matching record. If a record was found, the authorised form for the name was included in the record in a Subject Names (LCNAF) field. In the case of Daniel Wells and Henry McComas, neither name was found in the LCNAF. A local authorised form for each name was constructed according to accepted standards (Name Authority Cooperative Program practices) and recorded in a Subject Names (Local) field reserved for locally created names. This file of names became a local authority file that could then be checked and the form of a name represented in the file reused in additional records as appropriate. A search of LCNAF was also done for a name of the monument, with negative results. A name was then locally constructed and recorded in the Subject Names (Local) field as 'Wells and McComas Monument (Baltimore, Md)'.

In recording the subject content of the images, the Thesaurus for Graphic Materials<sup>3</sup> was used as the primary controlled vocabulary. This vocabulary is the visual materials supplement to the LCSH. For this aspect of the description, the focus was on the selection of terms from the controlled vocabulary that represented objects, persons and settings that appear in the image. This was a very literal interpretation of what an image is about and seemed appropriate to the collection given the commercial and documentary nature of the photography

involved. Terms were also to be chosen based on the level of specificity of the image. If an image depicted a house, the term 'Houses' was used, rather than listing all the pieces of a house such as 'Windows' and 'Porches'. It was felt that this would not only better represent the overall content of an image, but also better meet the expectations of a user of the database. In the case of the Wells and McComas image, the term 'Monuments & memorials' was assigned. This phrase is used to describe 'structures erected to commemorate persons, events, or causes'.<sup>4</sup> The image also depicts the surroundings of the monument within the city (see Figure 4). The heading 'Cityscapes' was chosen to represent this setting. Although this image does not depict the Battle of North Point, the monument is at least as much about the battle as it is about the men it commemorates. A search of LCSH discovered that the Library of Congress had created a subject heading for the battle and the heading 'North Point, Battle of Md., 1814' was added to a Subject (LCSH) field in the record.

The level of work described for this Wells and McComas image is representative of the work executed for images that included an identifiable building or location within Baltimore. It represented the maximum amount of time and effort that could productively be spent on a single image and could be as much as one hour. Of the total images, 438 or 17 per cent fell into this category of the most complex descriptive work provided for images in the collection. On the opposite end of the spectrum, there were 241 images or 10 per cent where little or no information was included and no additional information could be found in the image itself. The descriptive work required for these images could be completed in as little as five minutes. The earlier image of the rain gauge (Figure 2) falls somewhere in the middle of this

spectrum and is representative of the work required on the vast majority of the images. Although the caption identified the instrument as a 'sprinkler', a plate on the front of object, made readable in the scan via the zoom tool, identified it as a meteorological instrument built by the firm of Julien P. Friez & Sons of Baltimore. A catalogue of instruments made by the firm was readily found in the Smithsonian Institution Libraries database and it included several drawings of rain gauges. Within about 15 minutes, the image went from a 'sprinkler' to a rain gauge built by a recognised firm in Baltimore city.

Many of the activities undertaken by BMS staff in creating the descriptive metadata included some measure of quality control. Caption information transcribed by Special Collections scanners was of uncertain origin and unverified up to this point. Before basing a title or subject headings on the information, it was checked. One of the most useful ancillary resources was the Baltimore City Directory published by R.L. Polk and available online as a searchable database. The volume for 1923 fell in about the middle of the date range for the collection (1905–1940). It served as a reference source for the preferred form of business and personal names and to provide or verify the location of buildings and businesses. BMS staff also looked closely at images to capture all the textual information that appeared in images. There were business names on awnings and windows, street names on signs and buildings and names of manufacturing firms printed on machinery. Occasionally, there was a scan with reversed lettering or a ceiling fan hanging up from the floor. These scans were returned to Special Collections for adjustment to the proper orientation. As descriptive work was completed, the records were queued for approval by the

Catalogue Librarian. This was the final quality-control step for the descriptive work. Early in the project, feedback and corrections were provided to each technician on nearly every image. This was a critical part of the training process and was considered a long-term investment of time to develop the expertise of the staff for work on other projects. As staff gained facility with the vocabularies and other tools, this final step became much simpler and less time-intensive. Once all the records were approved, the metadata records were considered complete and the collection was returned to Special Collections for public release, publicity and outreach efforts to potential user communities.

## CONCLUSION

Since releasing the Hughes Company Glass Negatives Collection to the public, there have been several exchanges involving the public that have been particularly rewarding. Outreach by the Special Collection staff led to the use of many of the images in an online exhibition by UMBC Public History graduate students. The project utilised the images to demonstrate the growth of Baltimore from 1918 to 1939.<sup>5</sup> There have been at least ten personal contacts from individuals seeking to provide additional information concerning a particular image. The initial contacts were handled by Special Collections Librarians and the information was then shared with the Catalogue Librarian for verification. Results of verification were discussed with the Special Collections Librarians before further actions were taken. If the information could be verified, it was added to the image metadata by the Catalogue Librarian.

In one case, an individual identified a local ball field by name and location, neither of which appeared in the original



**Figure 4:** Image of Wells and McComas Monument from Hughes Company glass negatives collection

metadata. He also provided journal articles verifying the identification. Based on the documentation provided, the original metadata were edited to include the new information as well as citations for the articles. Another contact provided a name for a ball field in a different image, but without supporting documentation. This identification could not be verified and was not added to the image metadata. Six separate contacts involved identifications for buildings. Three of these provided additional information that was verified and added to the image metadata. A fourth identification was based on what the contact felt were similar structures appearing in another image. In comparing

the two images, the Catalogue Librarian found non-matching characteristics between the structures. In this case, the information was actually contradicted by evidence and no changes were made to image metadata. One of the more interesting contacts was a gentleman identifying the small child driving a horse-drawn bakery wagon as his father. He was interested in acquiring prints of the image for his family. Although the identification could not be verified, a note was added to the record about the personal identification made by the son.

The collaboration and division of labour between the Special Collections unit and the BMS unit used in this project

has since been successfully used to bring other image collections to the public. Future plans for the Hughes collection include the hope that the metadata might be reused to enhance access to other, related collections. UMBC also holds the Hughes Company Cirkut Negatives Collection. This collection consists of about 450 panoramic images taken between 1916 and the mid-1940s. Produced using a Cirkut camera, these film negatives are generally ten inches wide and range from about 20 inches to 50 inches in length. Many are group portraits of employees, club members and bands from in and around Baltimore. There are also some landscapes and cityscapes. A few of these images have been printed for exhibition, but most await exposure to a broader public. Additionally, the Hughes Company materials donated to two other institutions in Baltimore have come to rest at the Maryland Historical Society. They hold about 40,000 images as negatives and prints taken from 1910 to 1956. At this time, access to these images consists of finding aids and inventory lists accessible from the institution's website (<http://www.mdhs.org/library/special-collections-photographs>). Perhaps a future collaboration across institutions might

result in enhanced access to this body of material.

### Acknowledgment

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