



Article: THE PELLICULAR BURLESQUE
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THE PELLICULAR BURLESQUE

In 1994, the Metropolitan Museum of Art acquired the Estate of Walker Evans. This acquisition now forms the basis of the Met's new Walker Evans Archive. Among other materials received, were over 31,000 black and white photographic negatives, ranging in size from 8x10 sheet films, down to 35mm roll films.

While the proportion of sheet film material was numerically small, it posed serious conservation problems for the archive. All the sheet film material was pre-World War II, and, as would be expected, was a mix of nitrate base films and acetate base safety films.

There were a total of 1709 sheet film negatives: 735 - 8x10"'s, 629 - 6¹/₂x8¹/₂"'s, 313 - 5x7"'s, 12 - 4x5"'s, and 112 film negatives which had been cut down by Evans to other sizes.

Among these 1,709 sheet film negatives, we identified 20 different notch codes, 5 for nitrate films and 15 for safety films, and in each type of film, films manufactured by Kodak, Defender, and Agfa were represented.

Of the 1,709 sheet film negatives, approximately 75% were acetate and of this group, 793 (or a little over 60%) were already furrowed, or delaminated, and in the final stages of acetate deterioration. This presentation describes the methods used at the Chicago Albumen Works to retrieve and preserve the image pellicles from those 793 deteriorated negatives.

In reading the scant literature devoted to the conservation of deteriorated gelatine negatives, whether they be glass plates, or nitrate or acetate films, a number of themes recur -- first, that unsupported gelatine image pellicles are liable to shred or even dissolve during the proposed treatments, second, that the goal of adhering a pellicle to a new support is difficult to achieve and such procedures have never been put to a true test of archival permanence, third, that the manipulations required for any technique require extreme dexterity, and, fourth, given all the above, any routine for retrieving a deteriorated negative must be prohibitively costly.

The routines invoked at the Albumen Works address each of these issues, as well as speaking directly to the three faces of image conservation: fidelity, security, and reversibility. The procedures we have developed over the past ten years provide an approach to the preservation of these objects and images which is cost effective, provides a working routine which can accommodate substantial quantities of deteriorated material, and involves a treatment environment which puts the deteriorated original material at very little risk.

As you will see in the description below, the prevailing concept in our procedure is to never allow the pellicle, whether still supported or loose, to become wet in an aqueous solution. Once a pellicle is in a solution containing more than about 10% water, it swells, loses its dimensional stability and strength, becomes susceptible to silver migration, and begins to behave more as a sheet of gelatine adhesive, ready to glom onto anything.

The ability to separate an image pellicle from a deteriorated acetate film base relies on the presence of cellulose nitrate subbing layers between the emulsion and

anti-curl layers and the acetate film base. The initial separation of the pellicle from its deteriorated acetate base can be accomplished by dissolving away these nitrate layers in a non-aqueous solvent combination. Subsequent solvent baths perform three tasks. They clean the pellicle of residual cellulose nitrate retained from the first stripping bath, they allow a progression from dangerous solvent chemicals to the use of a potable alcohol, and they introduce a controlled amount of water to the pellicle to allow it to relax and be temporarily flattened, without evidence of its previous furrowing.

The second place where we deviate from most previously published routines is that we do not re-mount the pellicle. Rather, we dry it of its solvents and minimal water content and return it to the institution - flattened, in a folded pouch, between stiffeners, in a normal archival paper enclosure. A dry, unsupported gelatine pellicle is amazingly tough and strong, rather like cellophane.

While re-supporting pellicles may seem like an obvious end goal, in practice, it rarely serves a beneficial function for the institutions which own deteriorated negatives. Some published procedures call for re-adhering to glass. This seems uniquely recidivist, creating a whole new collection of objects with just the sort of preservation problems collections would like to avoid. Other techniques of adhering the pellicle to coated polyester sheets are untested for archival stability, as well as being time consuming and delicate, hence costly.

While we have developed a method for re-adhering pellicles which we feel is both permanent and reversible, we do not recommend it for these same reasons: it is a delicate procedure, would be relatively costly, and puts the pellicle to undo risk during the process.

As a practical matter, it is difficult to conceive of any institutional need which cannot be met perfectly well with an accurate duplicate of the original image pellicle. Any printing, whether, on vintage or contemporary media, can be done from such a duplicate, and it has been our experience that whether an institution requires reference prints or exhibition prints, it is the quality of the print that is important, not the generation which produced it. The aura requiring a print to be derived directly from an original negative is, thankfully, one restricted to the commerce of photography.

Should a true need arise, however, the stored pellicle could be re-adhered at a later date, especially if a mounting procedure were developed which were tested to be secure and reversible. It should be noted, however, that compared to duplicating, re-adhering will produce a less satisfactory result in all cases where the pellicle is cracked or torn, which, unfortunately, is relatively often. In a duplicating procedure, many cracks and breaks can be butted together nearly perfectly, as will be seen in some of the later slides, but in any re-adhering technique there inevitably will be a slight shrinkage upon drying, which will re-open the cracks.

Let me take you through our procedures. First, an establishing shot of the stripping area. In the center, our fume hood, simple, but specifically designed for this use, with a clear glass top which provides viewing from above and eye protection. To the right, a work table. and to the left a contact exposing apparatus, with filter drawer at the bottom and a vacuum frame on the exposing surface.

Prior to immersion in the stripping solvents, we make a reference slide of each original negative. While in normal

duplicating such a reference is not needed because the duplicate provides its own reference, in a cost effective stripping procedure one may have dozens of pellicles batched at various stages of the procedure at once. Thus, the reference slides serve not only as pre-treatment documentation, but, as importantly, to identify the images as they come through the process to final inspection and collating.

Once the negatives are photographed, they are submerged, in batches, into a solution comprised of 50% methanol and 50% acetone. The quantity in a batch is determined by the depth of solvent and how compactly the stack of furrowed acetates will lie. If need be, one or two small 1/4" glass weights are placed on top to keep them submerged. A batch will usually consist of fifteen to twenty five negatives. The solvent container is covered tightly and the batch allowed to stand in the solution overnight, during which time the nitro-cellulose subbing layers between the deteriorated acetate film base and the gelatine image and gelatine anti-curl layers dissolve away.

The next morning, one finds a loose stack, whose layers alternate between image pellicle, deteriorated film base, and the anti-curl pellicle.

These are picked out of the solvent container, one by one, with tongs or gloved fingers. The image pellicle is placed in the second solvent container, and the film base (or what is left of it) and anti-curl layers are discarded to a tray in the rear of the fume hood, where they remain until their residual solvent has evaporated. They are then completely discarded to a covered trash container.

Even though the image pellicle is completely loose and separated, it is wet with nitrate-bearing solvent, and it may

still have undissolved nitrate subbing adhering to it. It probably is still folded and furrowed (although, as we can see, the ones coming through on the days we photographed were intact and only slightly furrowed).

The second solvent container is filled with methyl ethyl ketone, which rapidly dissolves any residual nitrate. I do not have a slide of the pellicles going into this bath, but the routine is identical to the slides you have just seen.

The image pellicles are left in the MEK for approximately an hour, after which they are transferred to a third container which contains the same type 50/50 methanol/acetone solution as was in container number one. (It is labeled in this slide "acetone/methanol #2".)

While functioning primarily as a rinse, the pellicles are allowed to remain in this bath for approximately one half hour.

From there, they are transferred to a fourth bath, again a 50/50 acetone/methanol rinse. After this fourth rinsing bath, the pellicles are free of all nitrate residue, but having been in totally non-aqueous solvents, they are quite crisp and anything but relaxed. They still show the folds and distortions of their recent past.

The next two solutions function to two purposes: first, they introduce a controlled amount of water to the pellicles in order that they may relax, but not become soft. And second, for the health of the operator, since the upcoming flattening and duplicating operations must be carried out outside the fume hood, the non-aqueous portion of the solvent is switched to 190 proof grain alcohol, in our case, bootlegged across the state line from Caanan, Connecticut.

Even laboratory grade ethanol is avoided due to the toxic denaturing solvents added to it.

The composition of the last two baths is identical. Two are used in succession to provide a more complete rinsing off of the last methanol/acetone solution. These last baths contain approximately 95% 190 Proof grain alcohol and 5% by volume of water. The specific gravity should read 0.825 which corresponds to an alcohol concentration of 92.5% by volume. One needs to monitor the specific gravity of these baths, for they tend to take on water from the air and lose relatively more alcohol than water through evaporation.

After an overnight, or preferable twenty-four hour, soak in the first relaxing bath, the pellicles are pliable and limpid. They are relaxed enough to be laid out flat on an exposing surface, but still "dry" enough to be easily handled without fear of their stretching or sticking or being prone to silver migration. With this level of controlled humidification, they assume their nominal size, and, when laid out, retain their proper shape without distorting.

Prior to flattening and exposing, the pellicles are transferred to the second, identical relaxing solution, as the first container will be contaminated with methanol and acetone. The pink coloration in these baths is due to dissolved anti-halation dyes.

Before I go on to the flattening and duplicating, I would like to make a few comments on scheduling a large job. If you have been counting, is evident that negatives started on day 1, should be ready to flatten and expose on day 3. Consequently, on day two, as soon as the first batch is transferred the MEK tank, and the first container strained of any debris, a second batch can be initiated. And likewise on day three, and so on. Thus, one may always have a batch of

pellicles ready to finish, and there may be pellicles resting at every stage of the procedure. In a day dedicated to stripping, ten to twenty-five negatives may enter the system and another ten to twenty five duplicated and dried pellicles may exit it. The actual quantity will depend on the size and condition of the negatives.

But what if something comes up, like this PMG meeting, and you have 75 or so pellicles in various tanks? Well, the pellicles are perfectly stable in any of the solvent or relaxing solutions. Indeed, this was a requirement of the production system, otherwise, any interruptions, or holidays, or illnesses would put the pellicles at risk.

After the pellicles have soaked and relaxed in the alcohol/water baths, they are taken, one-by-one, and placed on the glass surface of a vacuum contact printer. The printer is placed immediately in front of the fume hood, which will draw off most of the alcohol vapors.

The pellicle is placed onto the table top, "emulsion up," as it were, and covered with a sheet of 0.6 mil polyester.

A cloth wipe is used to squeegee excess alcohol from the sandwiched pellicle, care being taken to hold the polyester in place with the other hand. It is important to remove as much alcohol as possible. The thickness of the polyester cover sheet is also critical. A thicker sheet (even such as 1.0 mil) will cause too great a separation between the pellicle and the duplicating film, resulting in a reduction in image sharpness. (This is why, also, the excess alcohol must be removed.) Thinner polyester is available, but it is too filmy, and it stretches and creases too easily to be worked with. The 0.6 mil polyester provides excellent image

sharpness, and at the same time allows one to manipulate the image pellicle through it.

The alcohol layer attached to the pellicle allows it some ability to slide inside the glass/polyester sandwich. This allows one to work through the polyester, usually with the back of one's fingernail or a micro-spatula, to make local adjustments to the position of broken or cracked pieces. One can frequently produce nearly perfect butt joinings across cracks and fissures this way. Other implements, such as certain dental tools, are useful in reaching under the polyester cover sheet to undo small folds that frequently occur along cracks.

Once the pellicle has been squeegeed and any cracks manipulated together as successfully as possible, the glass plate is lifted off the exposing table so both sides of the pellicle can be checked for air bubbles and dust particles. If there are either, they must be removed, or they will show on the duplicate.

If there are no air bubbles, the glass is replaced and a temporary easel corner taped in position to enable the duplicating film to be properly positioned. In this case we were centering 6 1/2 x 8 1/2 images onto 8x10 inch film.

Find the image ID and corresponding exposure information from the slides, and expose the duplicating film to produce an archival film interpositive.

Once the exposure is complete, the pellicle is ready to be dried. Pre-cut two-ply museum boards and Light Impressions buffered Renaissance paper were used for the stiffeners and inner sleeve.

The pellicle is lifted from the table top by reaching under it with a micro spatula and lifting it up attached to the underside of the polyester cover sheet. The unfolded inner sleeve is immediately slid under the pellicle, and the pellicle lowered in place onto it.

While holding two corners of the pellicle in place, the polyester cover sheet is pulled back, and the inner sleeve folded into it.

With the pellicle now in place in the folded inner sleeve, the polyester cover sheet may be removed. One museum board stiffener is slid under the pellicle, and the other placed on top. The wrapped pellicle with the stiffeners can be removed from the table top and slid into the correct negative sleeve.

The sleeved pellicles are stacked and placed under modest weight until they are dry - a few hours -, but we usually leave them overnight.

We have used these stripping, duplicating and drying procedures on a variety of projects with materials from Chicago's Field Museum of Natural History, the Library of Congress, the Atlanta Historical Society, and the Metropolitan Opera Association.

Its success relies on the religious avoidance of aqueous treatment solutions, its integration into an ongoing and well calibrated duplicating system, and the use of the drying procedure just described.

Obviously, an excellent fume hood is required, and a working environment of very low relative humidity - we try to stay at 35%RH, or less, and we suspend stripping projects during the humid summer months.

There are manufacturer to manufacturer differences in response. Luckily, for the Evans negatives, Kodak and Defender films of this period are extremely predictable and cooperative.

By contrast, Agfa films do not release as readily, and Ilford films, while they do release easily, have such extremely thin emulsion layers that they are nearly impossible to manipulate without distortion.

Even Defender and Kodak films do not always allow perfect results. Sometimes small pieces of emulsion are totally missing, having chipped off before treatment. Sometimes cracks are so prevalent it is impossible to close them all. On rare occasions, an indelible staining may have occurred, or, the emulsion may have undergone other deteriorations which become apparent only when released from the film base.

But, for the most part, it is an extremely predictable and safe routine. The duplicate is accurate and faithful, and the preserved pellicle is stable and available for future inspection or conservation.

Unintelligible images can be recovered.

Cracked emulsions can be mended.

And the ravages of time reversed.

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