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A TENTATIVE METHOD FOR CONSOLIDATING GELATIN DRY PLATES

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Severely flaking gelatin dry plates are a problem conservators have yet to solve. Small localized flakes have been successfully readhered with gelatin, methyl cellulose, or synthetic resins; but, as far as I know, these procedures have not been successfully applied to large areas of emulsion flaking. One possible solution, the use of moisture in combination with a resin, had been suggested in the literature, but it had not been tried. Last year, I was given an expendable, severely flaking dry plate, and decided to experiment with the moisture/resin combination.

This 8"x10" gelatin plate appeared to have been water damaged. There was fading of the image around the edges, severe flaking over one-third to one-half of the plate, and deposits of white crystals on the emulsion. Also, the white crystals were between the glass and emulsion, forming a gritty surface on the glass in these areas. The flaking emulsion was badly cupped, and I noticed that the flaking generally occurred in the low density areas of the negative.

From my experience with glass plates, I knew that applying an aqueous consolidant over such an extensive area would cause emulsion expansion problems. I also knew that a resin such as acryloid B-72 might hold the flakes in place, but would do nothing to relax them so they could lie flat. To circumvent these problems I attempted to set the flakes down with acryloid B-72 while humidifying the plate with moisture.

The procedure was as follows.

1. In areas of flaking, acryloid B-72 (5% weight/volume in xylene) was applied liberally onto the plate using a brush or eye-dropper, resulting in a thin resin film on the glass below the flakes.
2. Before the resin dried, the plate was humidified locally using an ultrasonic humidifier to which was attached a vacuum cleaner hose fitted with a small nozzle. The humidity relaxed and slightly expanded the emulsion allowing it to lie flat against the glass.
3. The negative was placed into a humidity chamber and allowed to set overnight. This step could possibly have been avoided, but I was afraid the emulsion would start to curl before the acryloid B-72 dried out.
4. In the morning, the plate was removed from the humidity chamber and allowed to dry. Before drying, the emulsion had expanded and the cracks between the flakes were invisible. As the plate dried the cracks opened up, but the flakes remained adhered to the glass. With the drying of the plate, there was also the reappearance of white crystals, mostly between the glass and the emulsion.

During subsequent treatment of several additional plates with less extreme flaking, I determined that the long period of drying in a humid environment was not necessary. In fact, I suspect this may have promoted the formation of the white crystals. Instead of using a chamber, the plates were locally humidified as needed, using the hose attached to the ultrasonic humidifier. Humidification in this way was repeated until the acryloid B-72 had dried enough to hold the flakes in place.

In the course of these treatments, additional changes were made to the procedure. Also, several potential modifications came to mind.

- Edges of large flakes sometimes lifted slightly during drying. To minimize this, these edges were coated with a bead of 1-2% gelatin (by weight). The gelatin was applied as the plate was drying out, after consolidation had been completed.
- In most cases, it would be desirable to have a duplicate negative of treated plates. The best time to make such a duplicate would be while the emulsion is still damp, before the cracks between the flakes begin to open up.
- Instead of humidification, it may be possible to relax the flakes by spraying with ethanol containing a small percentage of water.

As stated in the title, this procedure is tentative. It has not been extensively used or time-tested. Hopefully, it is the first step in the development of a successful treatment technique for severely flaking gelatin dry plates.