



SCIENCE

of Scrapbooking

BY DANIEL BURGE

Preservation Q&A with Daniel Burge

How long your scrapbook lasts depends on what you make it out of and how you care for it.

Q: HOW LONG WILL MY SCRAPBOOKS LAST?
— FRANK LEE EVERYONE, MAIN STREET, ANYTOWN, USA

A: As you can guess from the phony address, this question didn't really come from a particular person, but I didn't make it up either. I didn't have to. It's in the hearts and minds of most of us. Sometimes people ask this question about their albums as a whole, but more often the question gets asked with respect to individual products. People (whether consumers, retailers, or manufacturers) want to know how long this or that product will last. Maybe they feel that if each product will last a long time, their entire album will last a long time. That's actually not true, as there are problems with material interactions. But we'll save that issue for another day.

THAT'S PROBABLY NOT NEWS TO YOU. THE factors that determine the lifespan of an album are the same as those that scientists control when they do predictive testing. You may remember from last issue that the ways to accelerate aging in the laboratory are as follows:

- Increasing the concentration of the harmful agent (that comes from air pollution or reactive scrapbook products present)
- Increasing the temperature
- Increasing the moisture of the air otherwise known as humidity
- Or a combination of any two or all three of these variables

In your homes, these same factors will control the rates of degradation of your scrapbooks and memorabilia.

Take this little analogy, for example: How long will one gallon of milk last in the average home? If you ask people, their answers may vary from three days to a week. There are differences in time because there are differences in each home that influence the result. These factors include things like the number of people in the home and whether or not people in that house like to drink milk. A gallon is a gallon, but it will serve each family differently. And when it's gone, it's gone.

Just as there are a variety of factors for the milk question, there are a variety of

factors that determine how long scrapbooks will last. One of the most difficult parts of our inquiry is determining when the album is "gone." Your children or grandchildren won't one day open your album and find nothing in it like an empty milk carton. What they will likely find is something very different from what you created. How degraded would it have to be to disappoint them? How degraded would it have to be to disappoint you? Will it be when the photos have faded and are stained so much you can't tell who is in the picture? Will it be when the journaling has faded away leaving the faces nameless? Will it be when the adhesive has failed and your photos and artwork have fallen out or when the paper is yellow and brittle?

REALLY OUR QUESTION HAS TWO SUB-PARTS.

- 1 How much change in our albums do we allow before hitting the "unacceptable" limit in predicting their lifespan?
- 2 How long will it take for the albums to reach that point?

As you can see, it is difficult to pin down some sort of commonly accepted limit for scrapbook deterioration based

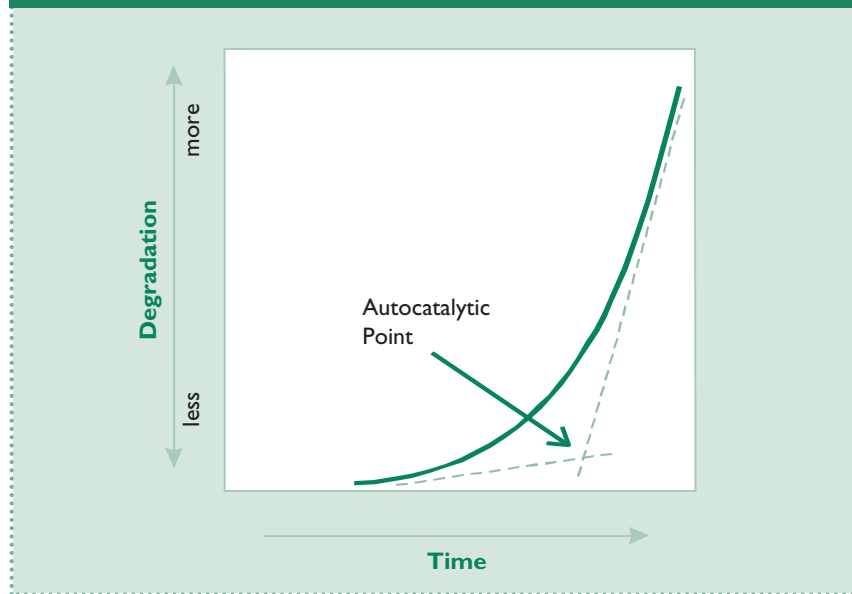
on changes in appearance. It would be nice if there were a way to look at the problem that removes personal judgment from the equation. Luckily there is, and it's based in science. Every change you see in an album over time is based on chemical reactions. These reactions occur very slowly, but not always at the same rate. Most reactions that are harmful to an album start slowly and then speed up. This is because as a scrapbook decays, it begins to **PRODUCE** the very same harmful agents that cause decay. These then reenter the process and further accelerate deterioration. This is called the **AUTOCATALYTIC EFFECT**. In essence, the album begins to eat itself.

The change from slow to fast rates of degradation has a definable point, and it is often before the onset of the most damaging symptoms. This is called the autocatalytic point. This is valuable because we can use it to predict how long an album will last **BEFORE** it begins to look awful.

Of course, each photo, piece of memorabilia, or scrapbook product will have its own chemical characteristics and will, therefore, change at different rates. Each photo, piece of memorabilia, or scrapbook product will also have different rates of change at each humidity and temperature combination. Therefore, the autocatalytic point of each scrapbook component will vary depending on the temperature and humidity (RH) of the storage environment. The autocatalytic point of an entire album will be a function of the most sensitive component.

An album in a home kept at 75°F and 70% RH will last only 15 years before hitting its autocatalytic point; that is, if mold doesn't destroy it first.

FIGURE 1: THE AUTOCATALYTIC POINT



The change from slow to fast rates of degradation has a definable point, and it is often before the onset of the most damaging symptoms. This is called the autocatalytic point.

Laboratories around the world have undertaken research to characterize how some of the more commonly used materials behave. As you can expect, these studies weren't done with scrapbookers in mind. But we can still learn from them. The most commonly studied materials have been paper, photographic base materials (the plastics used to make negatives, slides, and home movies), and photographic color dyes. Based on this data, it's possible to create a table indicating how long a scrapbook full of photos and memorabilia will take to get to its autocatalytic point at a variety of typical temperature and humidity combinations. This assumes, of course, that care has been taken to use the best quality materials in the first place.

As you can see, even across the various types of conditions we find in homes, there can be a real variation in life expectancy for your albums. A home kept at 65°F and 30% RH can help preserve an album in

good condition for almost a hundred years. An album in a home kept at 75°F and 70% RH will last only 15 years before hitting its autocatalytic point; that is, if mold doesn't destroy it first.

Will you see a ruined album exactly 100 or 15 years from now? No, these predictions are based on the album's chemical state after that many years, not on its physical appearance. However, when the autocatalytic point is reached, the rate of change will increase dramatically. So if at 15 years everything looks only slightly different, you can't assume that in another 15 years it will be only a little more degraded. In reality, it may be severely degraded or ruined another 15 years down the road. The older an album is, the faster it is changing.

Three other factors can complicate the predictions in the above table. These are the levels of pollution in the air, the quality of scrapbook materials you use,

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FIGURE 2: THE AUTOCATALYTIC POINT & MOLD RISK

		Average Temperature		
		65F	70F	75F
Average Humidity (RH)	30%	100	65	45
	40%	75	50	35
	50%	55	40	25
	60%	45	30	20
	70%	35	25	15

At risk for mold

A home kept at 65°F and 30% RH can help preserve an album in good condition for almost a hundred years.

and the inherent stability of the photos and memorabilia you include. The higher the air pollution in your area, the lower the predicted lifespan will be. Using scrapbook materials of unknown or suspect quality may also lower the predicted life. Using scrapbook materials known to be harmful will definitely

lower the predicted life of an album. Older memorabilia or unstable memorabilia (like newspaper clippings) will all have shorter lives than new or stable memorabilia (like photocopies of newspaper articles). In reality, the points at which your albums begin to show signs of degradation will likely not match the numbers above exactly.

Don't rely on numbers or equations alone, and don't just rely on product packaging claims. Take care to use quality products, and try to keep your albums in the most optimal conditions possible. Simply put, how long your scrapbook lasts depends on what you make it out of and how you care for it.

If you would like to submit a preservation question, please address it to dmbpph@rit.edu, making sure to include the words "Scrapbook Retailer Preservation Q&A" in the subject line.

Daniel Burge is a Research Scientist at the Image Permanence Institute at the Rochester Institute of Technology. He has been investigating the potentially harmful interactions between photo storage products and photographs for the last twelve years. He is also an active member of the Scrapbook Preservation Society.

PRINCIPLES AND PRACTICES

- 1 The temperature, humidity, level of pollution, quality of scrapbook materials, and the inherent stability of your photos and memorabilia all affect the life of your albums.
- 2 Reducing the heat and humidity of your home even by a few degrees in temperature or percentage points of RH can have significant effects on the lifespan of your scrapbooks and memorabilia.
- 3 Put copies of old, degraded, or unstable new materials in your scrapbooks instead of the originals. The scrapbook probably won't extend the life of the original object, and the object itself might hurt other parts of the album.