

Artists, Papermakers, and the Future

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This editorial considers three groups of individuals and how they often find themselves following common ways of thinking. Artists, especially those who become well known, are hard workers and somewhat stubborn. Once they have found a type of paper that works well for them, they tend to develop loyalty to it, regardless of what the label on the ream wrap may say. Papermakers, ancient and modern, likewise have tended to stick with practices that are convenient to them at the moment, whether or not they contribute to archival quality. Fortunately, the transition to alkaline papermaking practices means that modern printing papers tend to last a lot longer. Increasing knowledge of the importance of acid-free paper, as well as the principles of sustainability, are making positive contributions to our ongoing cultural heritage, at least to the part of that heritage that is related to cellulosic materials.

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Artists and their Selection of Paper Media

In April of 2024 I had the good fortune to view the paper conservation work area at the Metropolitan Museum of Art in New York City. It so happened that the conservator team had just received an original sketch sheet in which Leonardo da Vinci had sketched a small prototype of what later became a large and famous painting. On the back side of that little sheet, Leonardo had sketched some other small items, since that's what artists and doodlers do. Leonardo did not have much choice of what kind of paper to use. He used the same paper that his neighbors were using mainly for writing.

The historian Peter Bower gave a talk the same day at the Met. He spoke about how several well-known artists of centuries past went about choosing the kinds of paper onto which they applied their craft – with an emphasis on watercolor art. The most well-known artists, according to Peter Bower, never used paper designed for art. Rather, artists such as J. M. W. Turner tried out paper that was readily at hand, which was often intended for writing. Once they discovered something that they liked, many of them would continue to use the same paper for years at a stretch. One of the conservator staff suggested that the artists likely were drawn towards paper that happened to have a degree of water holdout that best fit with their personal styles and paces of work.

Commonalities of Some Artists and Papermakers

Some artists and some papermakers have a lot in common. Both careers require an appetite for long hours of often repetitive work. An ancient traditional papermaker, or often a family group of such papermakers, might go through a tedious, multistep process involving many days to harvest paper mulberry saplings, soak them, strip the bark, soak it

in lye, expose it to sunlight, separate the bast fibers, beat the pulp with wooden mallets, form the sheets, press the sheets, and dry the sheets (Hunter 1947). Modern papermakers, though they use more mechanized and even computer-controlled equipment, still have to go through many exacting steps, which are often carried out continuously, day and night. Though artists may apply a great deal more creativity in doing their work, they need to have a large tolerance for tedium. If they are not passionate, there is a good chance that they will find something else to do. And whereas a work of art needs to be unique, the paper onto which the article often applied needs to fade into the background in order to perform its function.

Many papermakers and many artists are strongly focused on the present moment. In ancient times, a sunny day could provide the precious opportunity for outdoor drying of many paper sheets. Papermakers of any age face pressures of scheduling, maintaining production goals, and staying in business for another day. Artists, likewise, may work feverishly, hoping to complete their work while inspiration remains fresh. The archival quality of the product may become a secondary or a completely neglected consideration in some cases.

Being stubborn, as well as being creatures of habit, many papermakers have persisted in using some practices that can hurt paper's long-term storage stability. Since the early 1800s, papermakers have tended to use increasing amounts of aluminum sulfate, or "papermaker's alum" during formation of the sheet. The alum helps to speed up drainage of water from the sheet as it forms, thus increasing the production rate. In addition, the alum has served as a binder for rosin, the traditional substance used to make paper resist water. Unfortunately, the alum has been highly unfavorable for paper's storage stability. Alum's acidity can set off an autocatalytic process in which acetate groups present on hemicellulose are converted to acetic acid. This increasingly acidic condition within many stored books leads to hydrolysis of glycosidic bonds within cellulose, which renders the paper more and more brittle.

Hope for the Future

Fortunately, in the late 1980s and early 1990s, there was a transformation in the part of the paper industry dealing with printing papers (Hubbe 2005). Developments in the synthesis of precipitated calcium carbonate (PCC) made it increasingly attractive as a potential substitute for the clay filler, which had been mainly used in printing papers up to that time. Developments related to hydrophobic sizing technology made it possible to replace the rosin-alum system with so-called "reactive" sizing technology that was not acidic. In fact, the pH-buffering action of the PCC required that papermakers move away from the usage of alum. A consequence of this worldwide transformation to alkaline papermaking conditions is that the rates of paper's yellowing and embrittlement are at a small fraction of what they were in the bad-old days of acidic papermaking. Books printed earlier than about 1985 still show rapid loss of strength, whereas paper made after about 1995 generally does not. Technology is available to remove acidity from old books, in a process called "mass deacidification" (Hubbe *et al.* 2018; Horst *et al.* 2020).

Artists, as a rule, also have become increasingly knowledgeable in recent years about sustainability. Many of them have modified their practices to emphasize less toxic colorants and a variety of other practices that are less damaging to the environment. Hand papermakers are likewise gravitating towards increased reliance on photosynthetically renewable natural materials. Knowledge of the damaging nature of acidic conditions has

become widely shared among both articles and papermakers, including industrial papermakers. When a watercolor artist goes to buy paper, these days, even if they were to ignore science, there is a very high chance that they will happen to choose a paper type that will last for a great many years.

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