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A New Material for the Conservation of Papyrus

ABSTRACT

For many years papyrologists and conservators of papyri have used different kinds of tape to align papyrus fragments. Some of these tapes have been very damaging to the papyrus or to the writing on it. In this short paper I relate my experience using a remoistenable adhesive—a 4% solution of a pharmaceutical grade, high-viscosity-grade sodium carboxymethylcellulose (SCMC), Aqualon Cellulose Gum CMC 7H3SF PH and Japanese paper (Colored Kozo, CK-3, Hiromi Paper International). This experimental remoistenable paper was given out to attendees at the XXV Congress of Papyrology, July 31–August 3, 2007, held in Ann Arbor, Michigan. Initial indications from a number of international papyrologists is that repair strips made from this remoistenable paper are proving useful, not only at excavations, but also in papyrological institutions.

REMOISTENABLE TISSUE FOR REPAIRING AND ALIGNING PAPYRUS FRAGMENTS

Over many years as a papyrus conservator I have seen numerous repairs and alignments done with all kinds of tape. In the early years papyrologists used postage stamps or white and brown gummed-paper tape. These were opaque tapes with water-remoistenable adhesives. Because no one could see through these, they were often applied in areas where there was no writing, mostly on the back of the papyrus. Generally, they can be removed safely by dampening the tape with a small amount of water using a brush; this removal rarely destroys fibers or ink.

In the 1950s a variety of self-adhesive tapes came into use for mending, and they consist of a clear or "frosted" cellulose-acetate carrier and an acrylic polymer adhesive. This kind of tape is also called pressure-sensitive because light pressure causes it to stick readily to any surface, including papyrus fibers. From papyrologists I have heard comments like: "Leyla, it was magical and sent from heaven because you can see through it."

Unfortunately, pressure-sensitive tape presents a major problem for papyrologists and papyrus conservators. Time and experience have shown that pressure-sensitive tapes on papyri are disfiguring, damaging, and difficult—sometimes impossible—to remove without seriously damaging the papyrus or the writing on it. The adhesive is not water-soluble, it discolors, and over time it oozes and then dries out, leaving insoluble stains and adhesive residues in the papyrus fibers. Additionally, the tape no longer holds fragments in their initial alignment.

Relatively new "archival" tapes on the market are made with a thin paper carrier and an acrylic adhesive. For a short period of time—maybe a few months—these tapes can be removed with heat or an organic solvent. But once the acrylic adhesive has set and aged, organic solvents in increasingly heavier applications must be used to remove it, if it can be done at all.

During visits to several different collections and excavation sites to inspect papyri, I have been asked to help because a self-adhesive tape had been used and the original alignment had proven to be incorrect. In some cases I was successful in removing the tape, but in others I had to leave it in place. In this situation, I was asked to cut through the tape to separate the incorrect alignment so that the papyrologist could correct it.

In the past I experimented with different materials and also did research to try to find a commercial transparent, archival, and reversible tape, albeit unsuccessfully. My intention was to find a substitute for the pressure-sensitive tapes that are still being used by many papyrologists. Ideally mending strips need to be sound, non-damaging, and easy to remove. They also need to be convenient to carry to remote locations for use at excavation sites, and

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Fig. 1. Trial samples of remoistenable mending tissue for papyrus. These mending strips were made over the winter in very dry conditions, which caused the paper to curl. This turned out to be an advantage: I flattened the roll and vertically cut narrow strips ready to use. Left: the remoistenable Japanese paper rolled up into a tube and flattened; right: cut strips measuring 1–3 mm wide (leaving the top of the tube uncut makes the strips easier to handle and store).

especially they must require a minimum of effort to use in order to compete with pressure-sensitive tape.

A few years ago our senior paper conservator, Dr. Cathleen Baker, introduced me to sodium carboxymethylcellulose (SCMC), an adhesive she has successfully used in paper conservation. I started working in book conservation with 2% and 4% solutions of the SCMC she recommends, Aqualon Cellulose Gum CMC 7H3SF PH. As I got to know more of the specifics, and the pros and cons of this adhesive, I became interested in using it in the conservation of papyri. Together Cathy and I designed a remoistenable repair paper made with a Japanese handmade paper carrier and a 4% solution of the recommended SCMC. The materials, suppliers, and instructions for the production of this paper can be found in Cathy's article elsewhere in this *Annual* (pp. 177–185).

I distributed test samples (fig. 1) of this paper to 250 papyrologists in July 2007 at the XXV Congress of Papyrology. I asked papyrologists to try the tissue at their home institutions and in the field, and I have heard back from a number of them. Initial indications from practicing papyrologists is that repair strips made from this remoistenable paper are proving very useful.

JUST CUT, MOISTEN, AND APPLY

From a larger prepared sheet, one can tear or cut small pieces or strips and apply just a very small amount of moisture on either side to reactivate the adhesive, using light finger pressure to hold in place for a few seconds. If very small strips are needed, a pair of tweezers are useful to hold the strip while moistening and positioning. It is not an entirely transparent material, but it is translucent. To remove the tape, if necessary, requires just a light application of moisture. The tape is stable over time, dries almost instantly, does not discolor, remains reversible in water, and is non-toxic. This tape is also resistant to pest and fungal attack, and has been successfully used in hot and dry climates.

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