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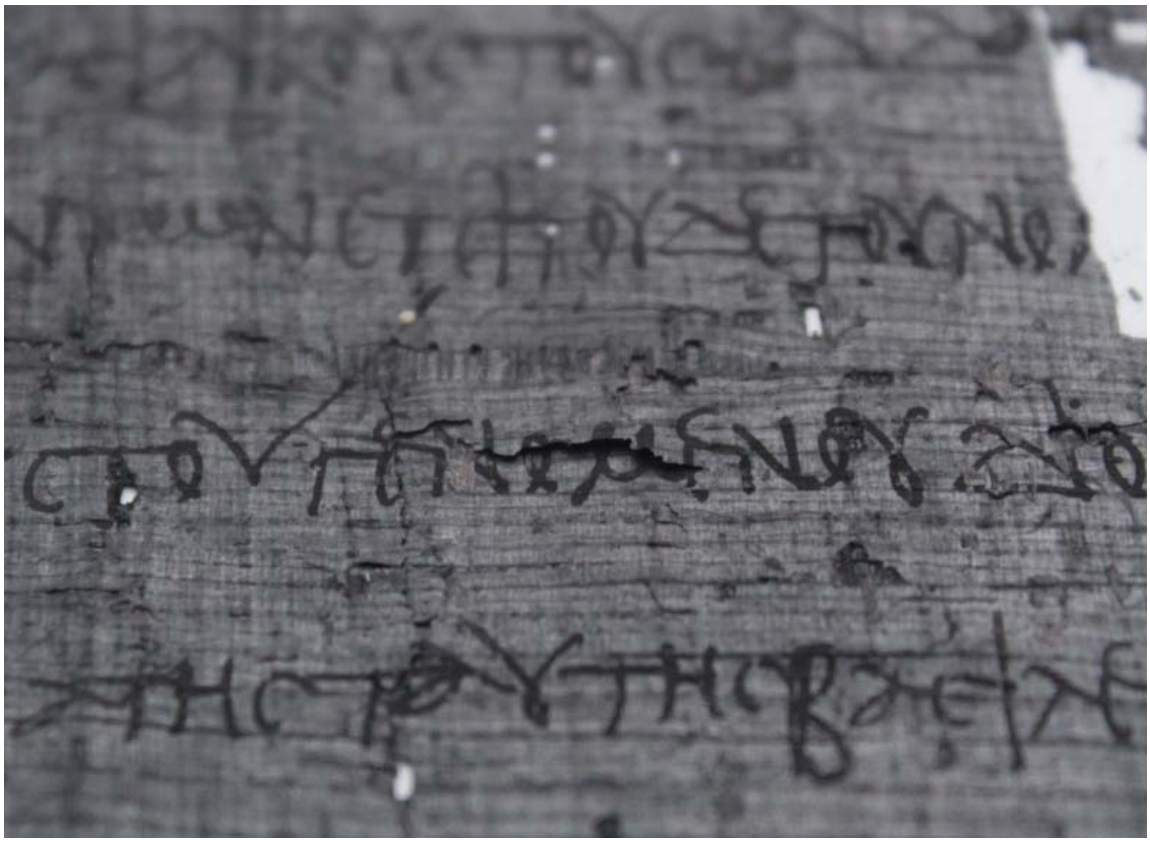

Restoration of carbonised papyri

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Restoration of carbonised papyri[1]

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In the standard work on the topic, Michael Fackelman notes that 'The restoration of carbonised papyri poses only two, though major problems: the opening of the rolls and their preserving before decay. One leads and often conditions the other.' (Fackelmann 1985, 63). There is however another problem, namely the handling of preservations techniques from a previous century. The manuscripts are usually in good condition, but most papyri need new treatment to preserve the texts on the fragments.

To halt decay of some of the carbonised papyri of the Cologne papyrus collection a new preservative concept was developed and implemented. The conservation treatment depends first on whether the object needs to be stabilized, and second, on the storage of the fragments. It is often difficult in papyrus collections, to mount the objects between new materials, as this changes the objects' dimensions and could cause problems with storage in existing collection cabinets. This had to be taken into account when selecting new mounting techniques. It was possible to create a suitable new object wallet. Moreover, the papyri were re-stabilized. The adhesive used for this purpose allowed for strengthening entire fragments as well as the fixation of small fragments and fiber layers.

Many papyrus collections contain carbonised papyri. Unlike non-carbonised papyri, their state of preservation is generally considered 'highly fragile' to 'crushed' (Leach and Tait 2000, 243). The most important carbonised pieces come from Herculaneum, Tanis, Petra and Bubastos (Brissaud 1993; Menei 1995; Frösén et al 2002; Lehtinen 1997; Lehtinen 2002). The earliest restorations of the Herculaneum papyri are generally the oldest such attempts (Travaglione 2005). After an initial restoration by Antonio Piaggio of papyri from Napels (Gilberg 1988; Capasso 1991), a series of subsequent experiments were made to reopen the carbonised rolls and make the texts readable (Kleve and Fosse 1988; Kleve et al 1991).

The 60 year- old treatment of the objects in the Cologne papyrus collection required conceptual reassessment (Hagedorn 1983). In 1961, Ludwig Koenen, Ursula and Dieter Hagedorn restored some of the fragments (Hagedorn and Maresch 1998, 1; Frösén and Hagedorn 1990). They used Japanese paper as a support material to release the fragments from the roll. These restoration measures made it possible to reveal and edit the texts of the scrolls. More recently, Jaakko Frösén restored some carbonised papyri from the Cologne collection (Kampichler 1985, 36).

Portions of the papyri are nonetheless in a poor state of preservation, necessitating a new restoration. Almost all carbonised papyri show strong changes on the object surface. The fibers break; some are already broken up. The aim of the proposed new treatment is to stop such disintegration (see Fig. 1).

The objects of the Cologne collection are mounted between glass frames or assembled in cardboard portfolios. In recent decades, carbonised papyri were conserved in different ways (Fackelmann 1970). Different (dispersion) adhesives such as Planatol, adhesives on a gelantine basis and various paste mixtures were used. In almost all cases the fragments were adhered to a paper carrier. Although this ensured that the fragments did not disintegrate

1 The original German article was translated into English. A German abstract will be provided at the end of the article.

further, the tension that arose when drying the fragments resulted in deformation (Geiseler 2008, 52).

The proposed method of conservation aims at better preserving the texts and the papyrus. The carrier material should not be separated from the fragments, as this will cause further loss of papyrus. In addition, the areas where fragments lie loosely on the carrier paper should be fixed again.

The following damage could be noticed (see Fig. 2):

1. Papyrus fibers dissolve and lay loose on the object surface
2. Abrasion from papyrus to the board creating text loss on the papyrus surface
3. Papyrus dissolves from the backing paper
4. Small fragments are loose on the object surface
5. Japanese paper has deformed
6. Residues of scotch tape on the backing paper.

A non-water-soluble adhesive was required for the new treatment of the fragments. By eliminating water, the adhesive can be applied to the papyrus surface and stabilize the fragments. The adhesive also allows for small loose fragments to be consolidated locally preventing further disintegration (see Fig. 3). To find the most suitable practice, various adhesives were tested and their drying reactions observed. Some adhesives caused immediate deformation of the (wet) background paper and the fragments thereon. With others, the support fabric and papyrus did not change. The best results were obtained with Klucel G dissolved in ethanol. By using a solvent-based adhesive, micro-fragments and even loose carbon particles could partially be strengthened in position on the support material without further deformation of that support. A water-free adhesive prevents the Japanese paper from causing new tension to the papyrus fragments and new breaks in the material structure.

In addition, it was possible to adhere the fibrous structure of the papyrus; loose papyrus fibers could be joined together. Once consolidated, the fragments were removed from the old folders and fixed on cardboard, which was covered with Japanese paper (see Fig. 4). This cardboard was inserted in the new passe-partout folder (see Fig. 5) where it can be safely kept, without contact with another surface. The portfolios are designed for horizontal storage.

German abstract

Die verkohlten Papyri der Kölner Papyrussammlung wurden auf eine notwendige Restaurierungsmaßnahme hin überprüft. Das Öffnen der verkohlten Rollen liegt bereits fast 60 Jahre zurück. Im Restaurierungskonzept wurden die entstandenen Schäden seit dem Öffnen dokumentiert und eine Behandlung der Objekte konzipiert, die einen weiteren Text- und Papyrusverlust verhindert. Dazu wurde eine Testreihe mit verschiedenen Klebstoffen durchgeführt. Der Klebstoff, Klucel G in Ethanol gelöst, erwies sich als am geeignetsten. Mit ihm konnten sowohl kleine Fragmente fixiert werden als auch lose liegende Fasern bis hin zu pulverisierten Fragmenten auf dem Trägerpapier gesichert werden. Für die Objekte, die bisher in Pappmappen montiert sind, wurde außerdem eine neue Aufbewahrungsform angefertigt. Die neue Objektmappe für lose liegende, unverglaste Papyri macht es möglich, die Fragmente in einer konservatorisch stabilen Form aufzubewahren.

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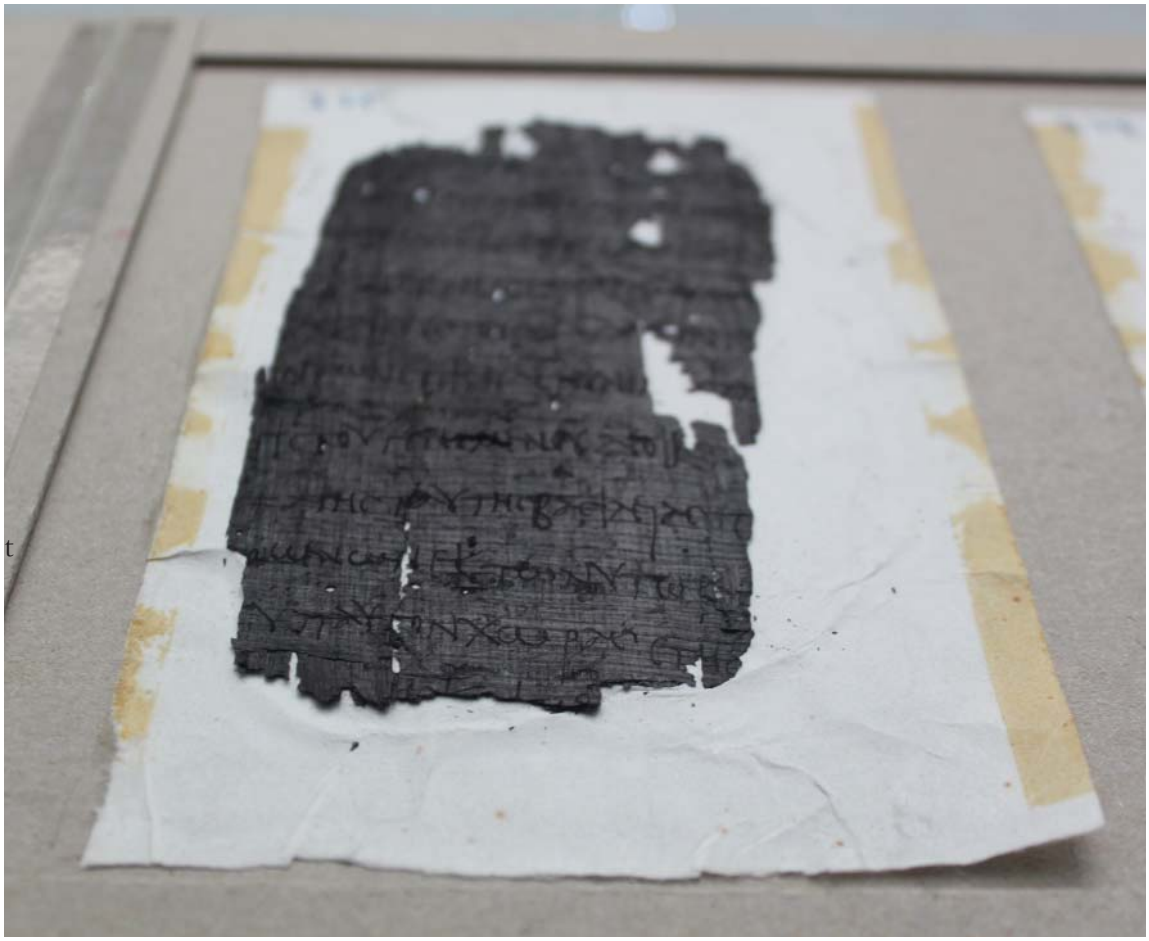

Fig. 1: Papyrus fragment in a cardboard folder.

Fig. 2: Fragments mounted in a cardboard folder, before restoration.

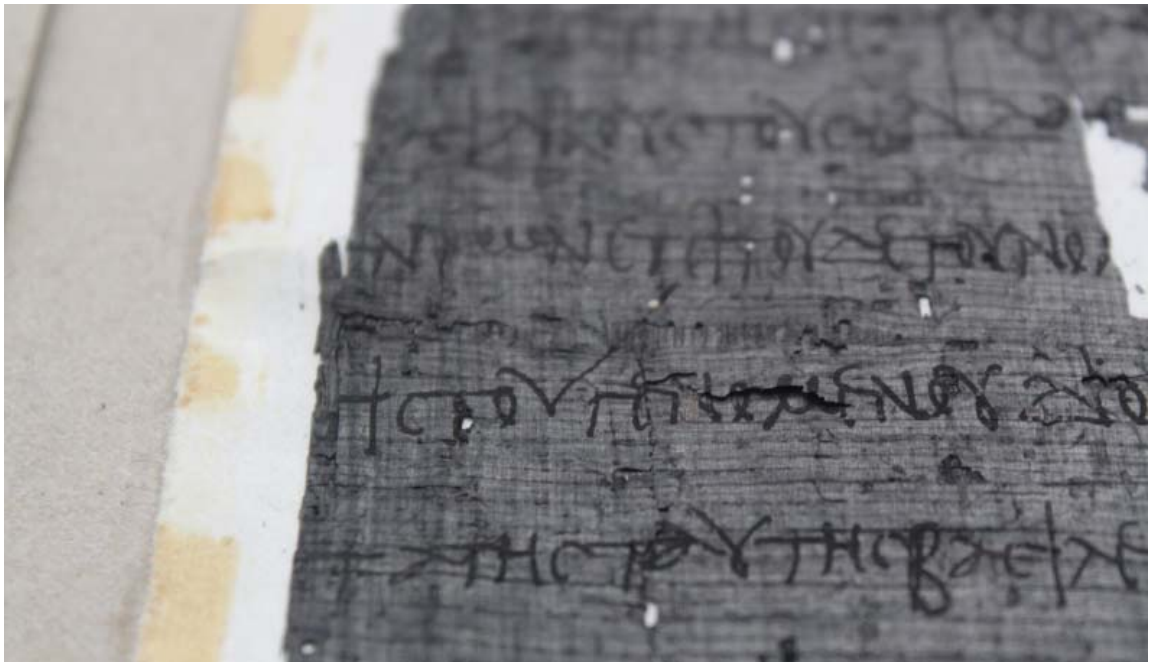

Fig. 3: Loose fibre layers.

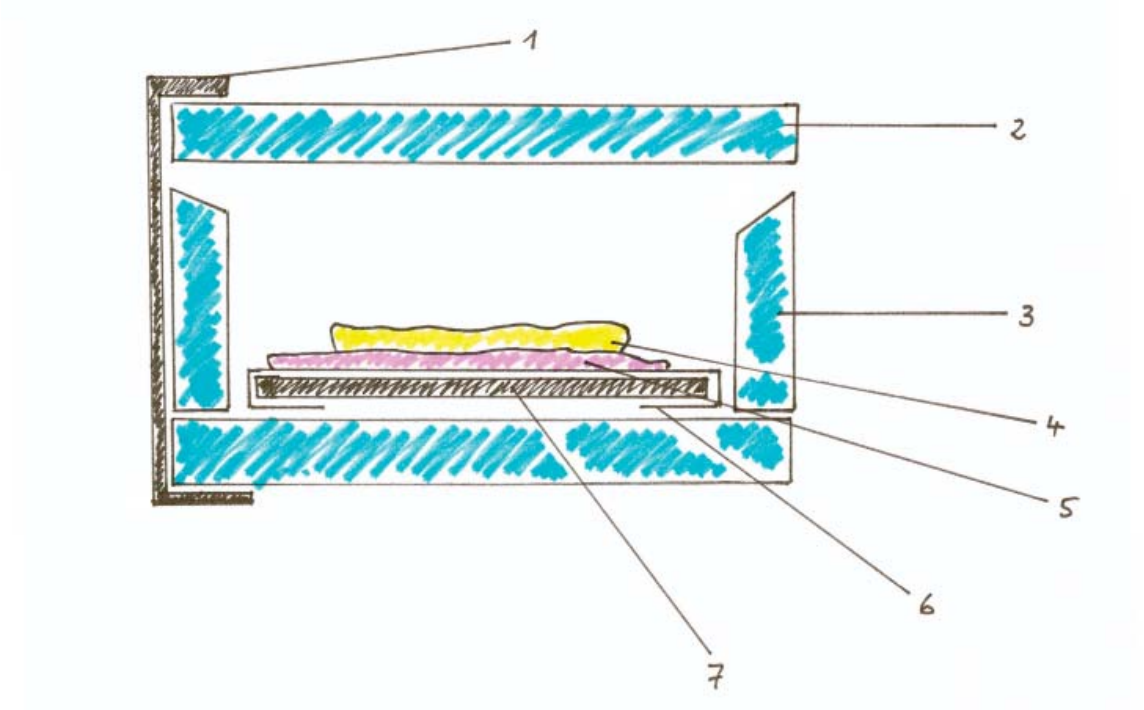

Fig. 4: Layered structure of the new object wallet.

Fig. 5: Fragments in the new presentation wallet.