

September 22, 2009 Handout for Bristol Adhesives Workshop-

CASE STUDY- Adhesives* used by Amy Davidson on a specimen of *Shuvuuia deserti* (IGM100/977) collected from Ukhaa Tolgod, Gobi Desert (Mongolia) in 1994.

*Note- the term "adhesives" is used here to include joining, consolidation and coatings.

Trade Name: Butvar

Grade: B-76

Chemical name: polyvinyl butyral (a terpolymer of VB, VAL and VAC monomers)

Manufacturer: Monsanto (now Solutia)

Date of Purchase: 1986

Setting Mechanism: SOLUTION ADHESIVE (sets by evaporation of a solvent)

Properties useful for this specimen:

Soluble in a wide range of Mongolian solvents which were hard to find and often impure

Tends to migrate back up to surface upon setting (due to evaporation of solvent carrier)

Very easily redissolved (more soluble than Paraloid B-72)

Weak adhesion – thick coatings can peel off (Paraloid B-72 adheres more strongly)

Relatively weak cohesive strength as a consolidant- compatible with Gobi matrix

Consolidates but does not impede separation of matrix from bone

Can be mixed with ground matrix to form a removable or reworkable paste.

Aesthetically pleasing matte finish. (Paraloid B-72 is shinier)

Very long shelf-life as a solid

Known chemical formula probably with no additives

Aging properties tested and acceptable (Feller *et al*, 2007)

Trade Name: Krazy Glue (also marketed as Aron Alpha)

Grade: 201 Ethyl White Cap (low viscosity formula)

Chemical Name: cyanoacrylate (an ethyl cyanoacrylate)

Manufacturer: Borden, Inc. (now Toagosei Co., Ltd.)

Date of Purchase: 1994

Setting Mechanism: REACTION ADHESIVE (sets by an irreversible chemical reaction)

Properties useful for this specimen:

Excellent penetration into cracks and pores (Butvar B-98 may be an adequate substitute)

Does not migrate back to the surface upon setting (does not contain solvent)

Can be applied in tiny drops

Sets to form very thin, hard coatings

Insoluble but can be softened and removed mechanically in small amounts.

Aging properties untested, unknown formula variations, but

probably acceptable stability as a consolidant in tiny amounts

Trade Name: Paraloid (formerly Acryloid)

Grade: B-72

Chemical name: an ethyl methacrylate co-polymer (PEMA/PMA)

Manufacturer: Rohm and Haas

Date of Purchase: after 1994

Setting Mechanism: SOLUTION ADHESIVE (sets by evaporation of a solvent)

Properties useful for this specimen:

Excellent adhesion as liquid and solid- good for joins

Most tested and reliably pure and stable adhesive (Down *et al*, 1996.,

Feller and Curran, 1975., Lazzari and Chiantore, 2000.; Chiantore and Lazzari, 2001)

Archival housings enhance the ability of adhesives to hold specimens together over time.