

Mount Making Successes and Failures
for Fluid Preserved Vertebrates
(and One Nudibranch)
at the
California
Academy of Sciences



Ian Hart

26 September 2018





Natural history research relies on fluid preserved collections

Important considerations

- Outside the jar
- Inside the jar
- The jar itself
- The jar and its environment



Outside the jar: just hold on

Philippine sea fan

The fan structure (*Solenastrea* sp.) forms individual, colonial polyps characteristic of coral. The branches intercept the current into clefts that redirect food particles to the filter-feeding polyps. Gary Williams, Invertebrate Zoology and Geology, collected this species from a depth of 88 m (290 ft) in a trawl net.

During...



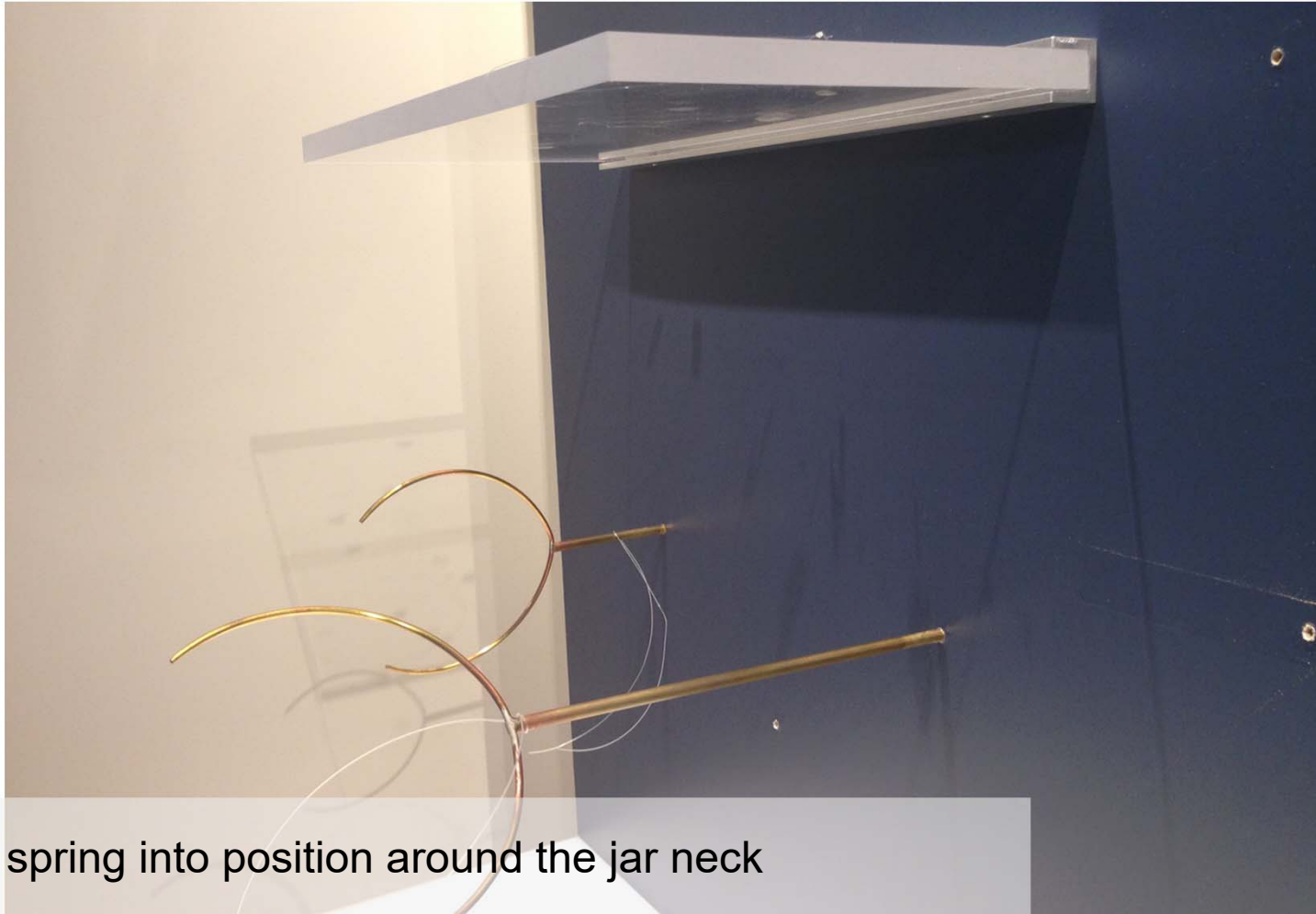
Typical jar mounting approach



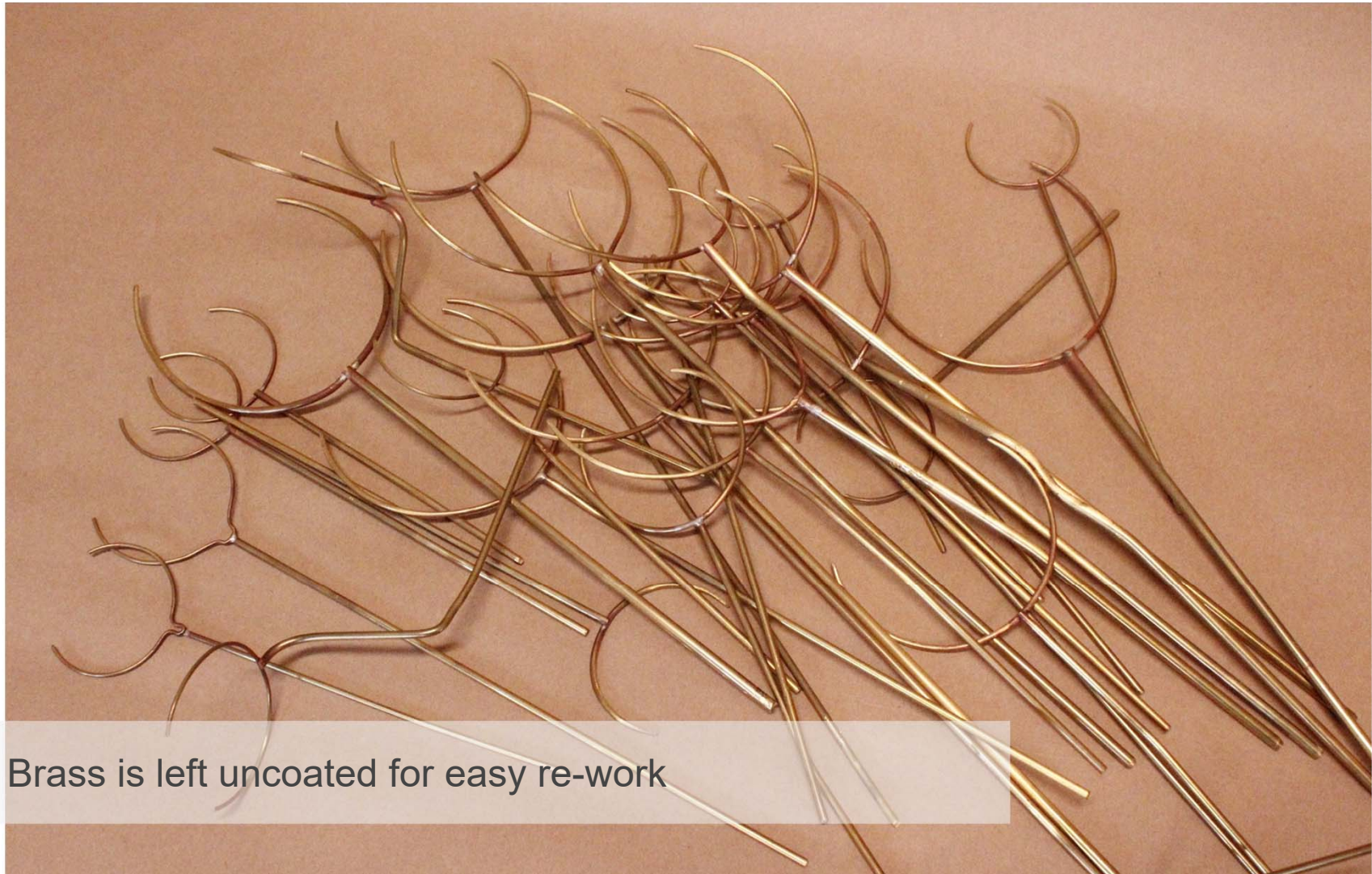
Wheat Mill
Side-ventilated
Polished Corn

Science
Barnett's Viper
Dolichopus

Specimens
help
Res
Our features
provide
fuel & heat
medicine
allow us



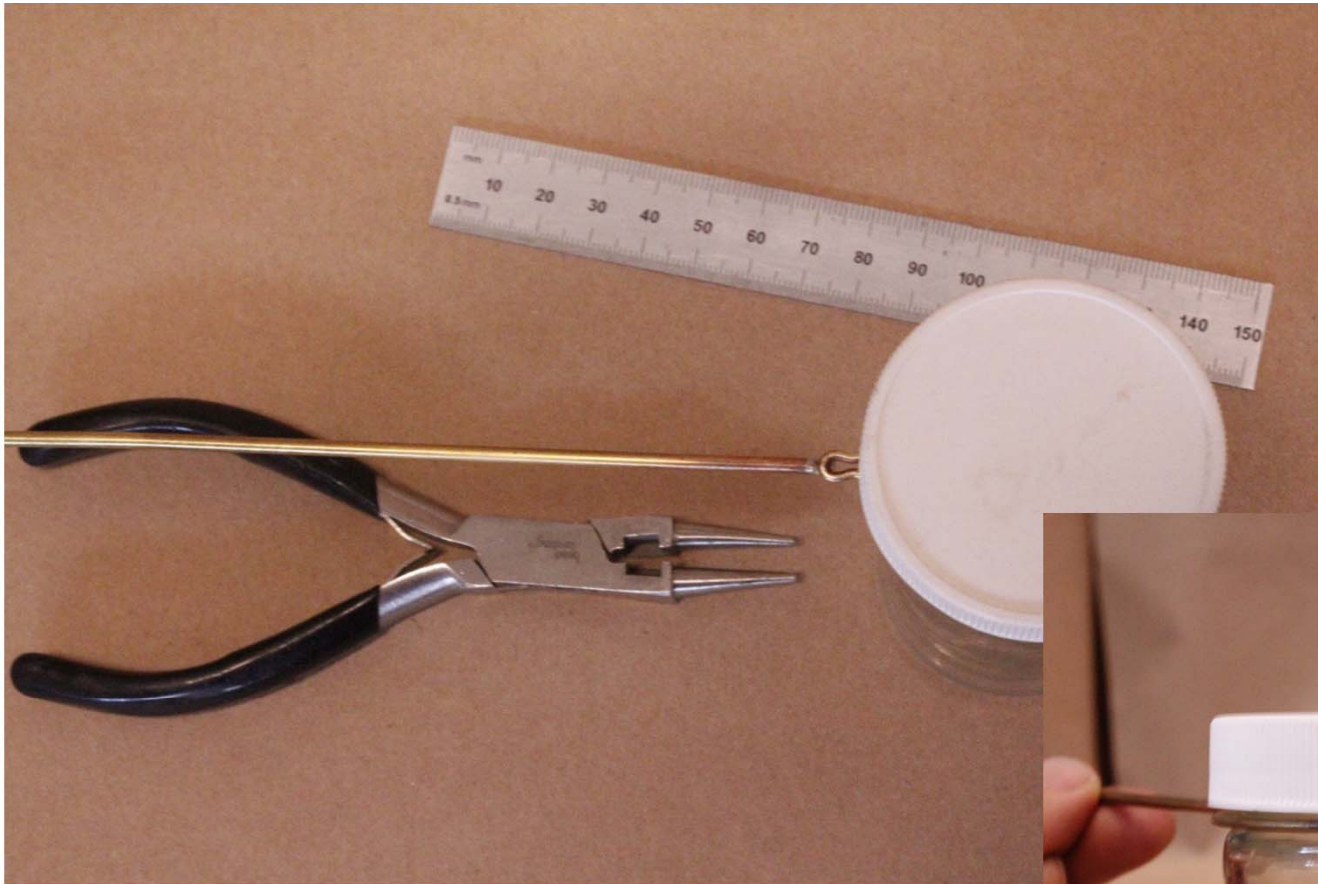
Arms spring into position around the jar neck



Brass is left uncoated for easy re-work

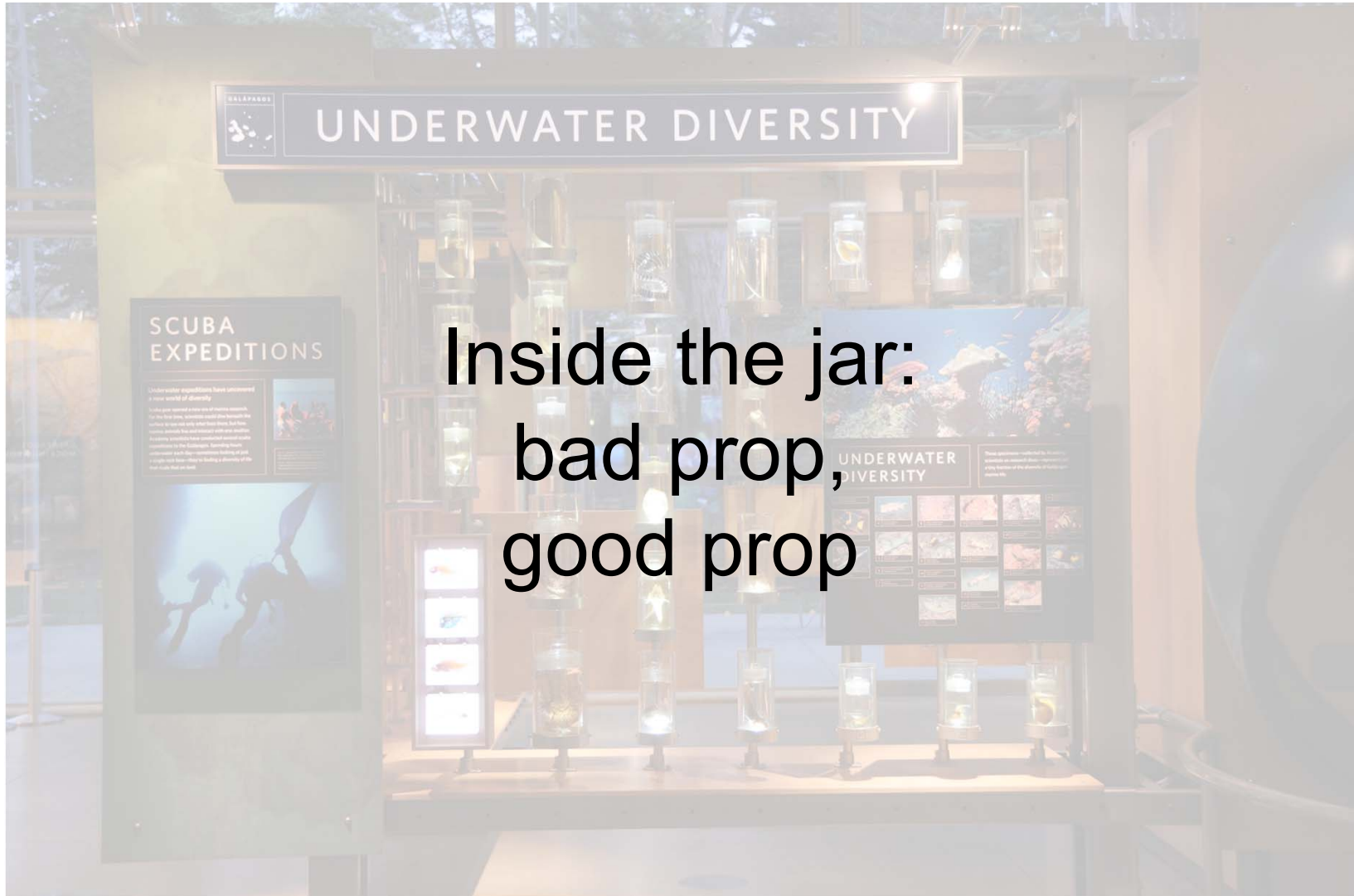


Design variation with U



Squeeze the U to close the arms





Inside the jar:
bad prop,
good prop



Collections preserved in 70% ethanol



Smaller specimens were propped on acrylic (PMMA) blocks



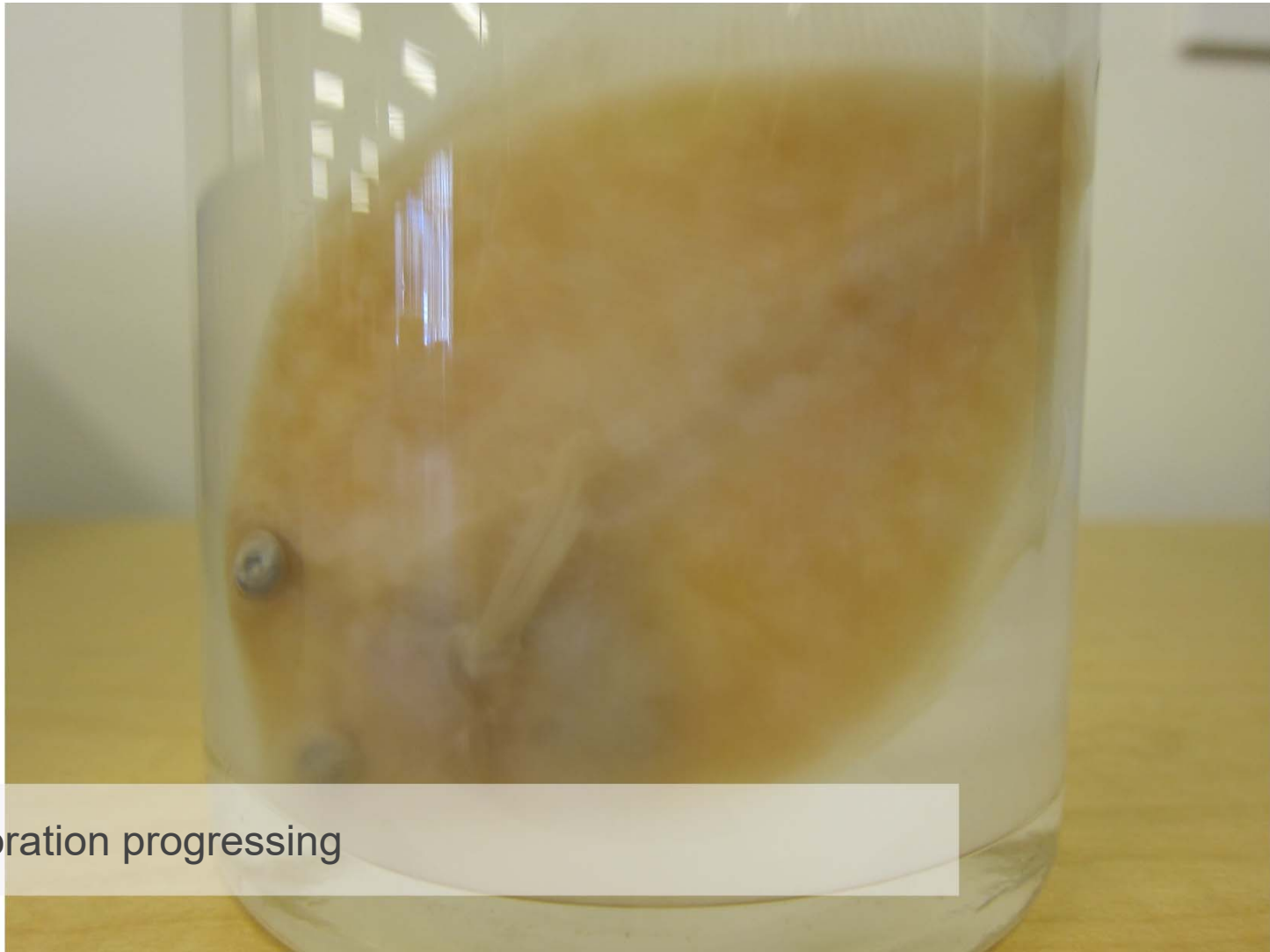
After 4 1/2 years, clouds and precipitant in a jar



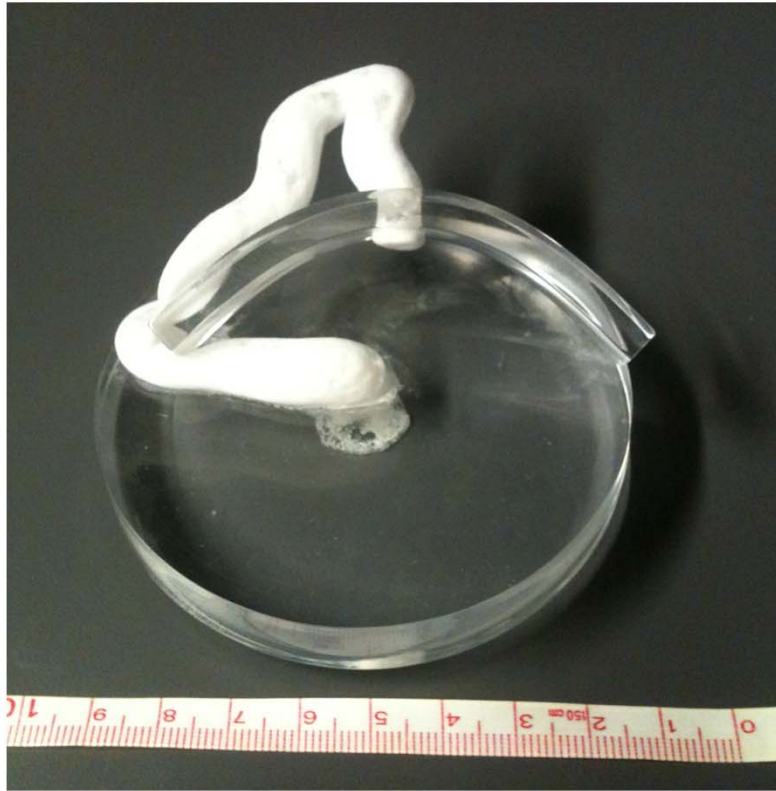




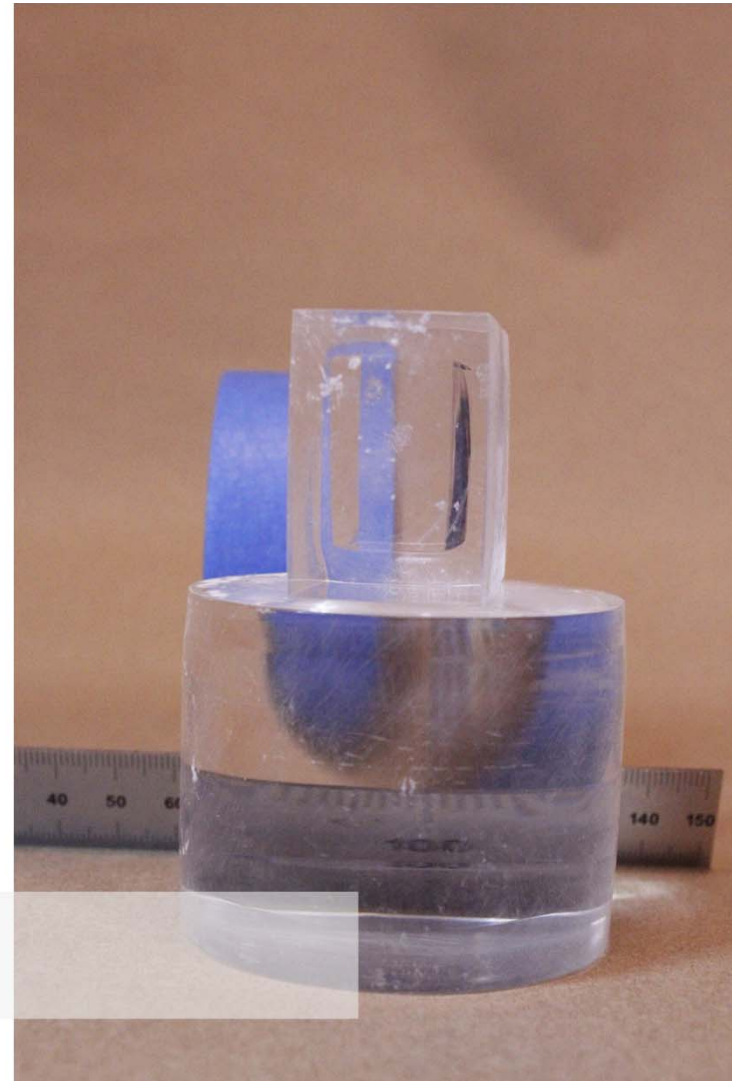
Acrylic blocks beginning to show signs of deterioration



Deterioration progressing

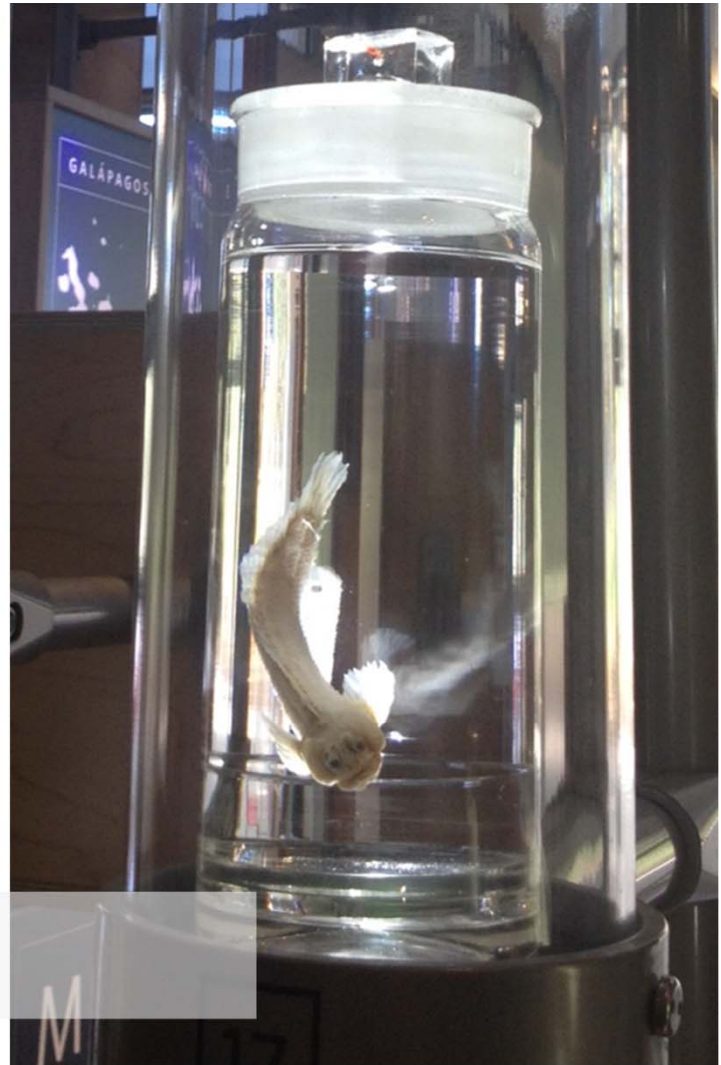


Bad props



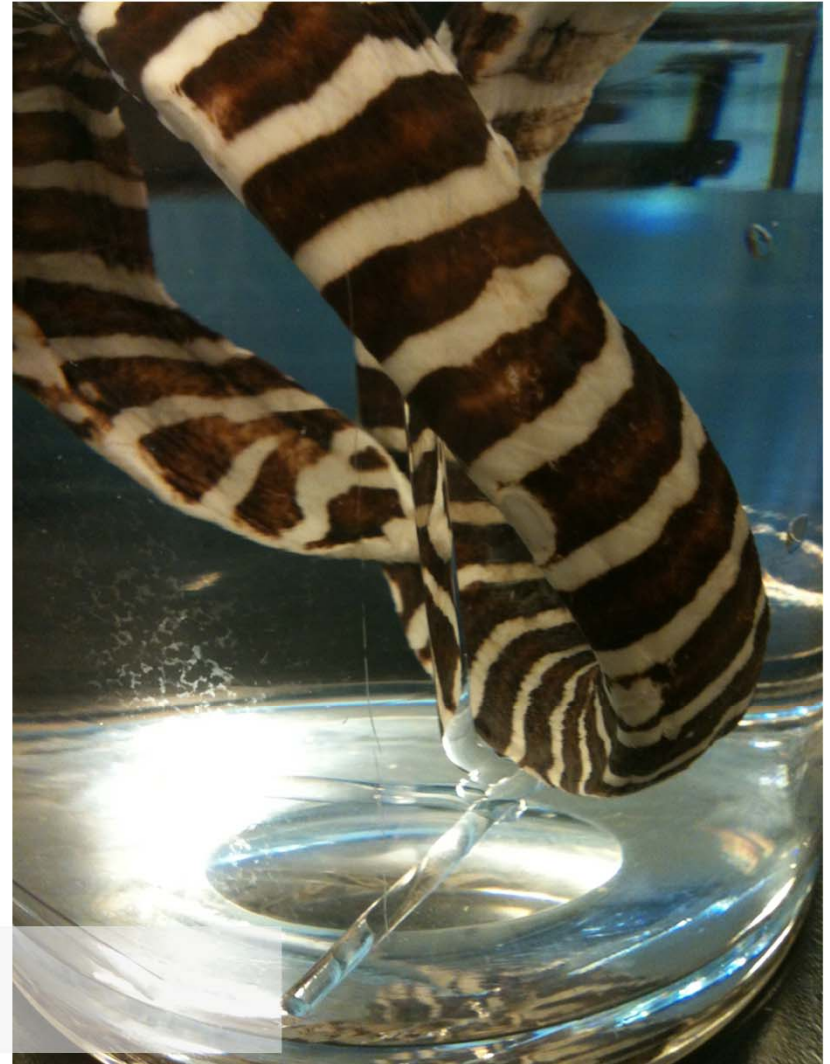


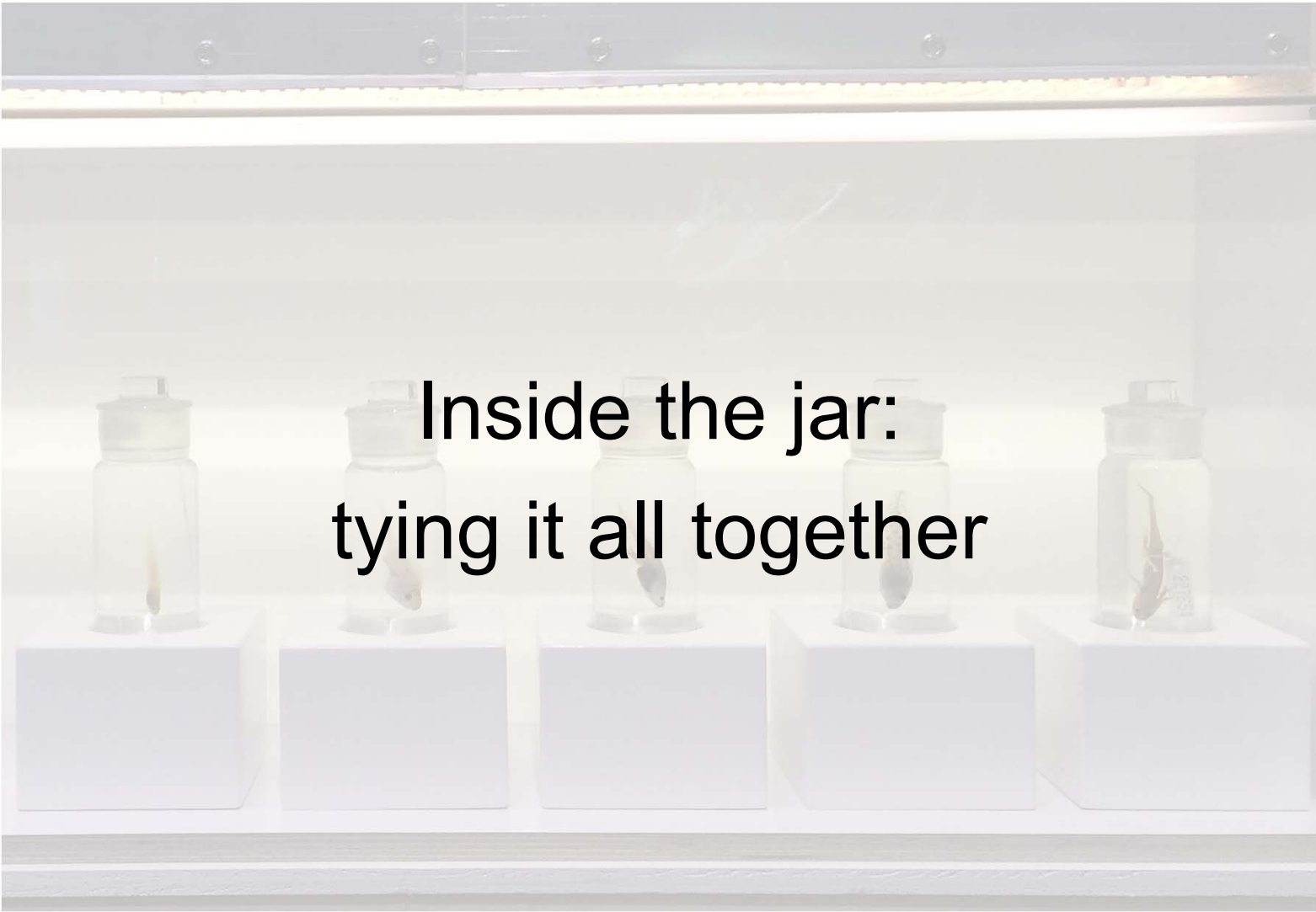
Good props





Flame-worked rod experiment



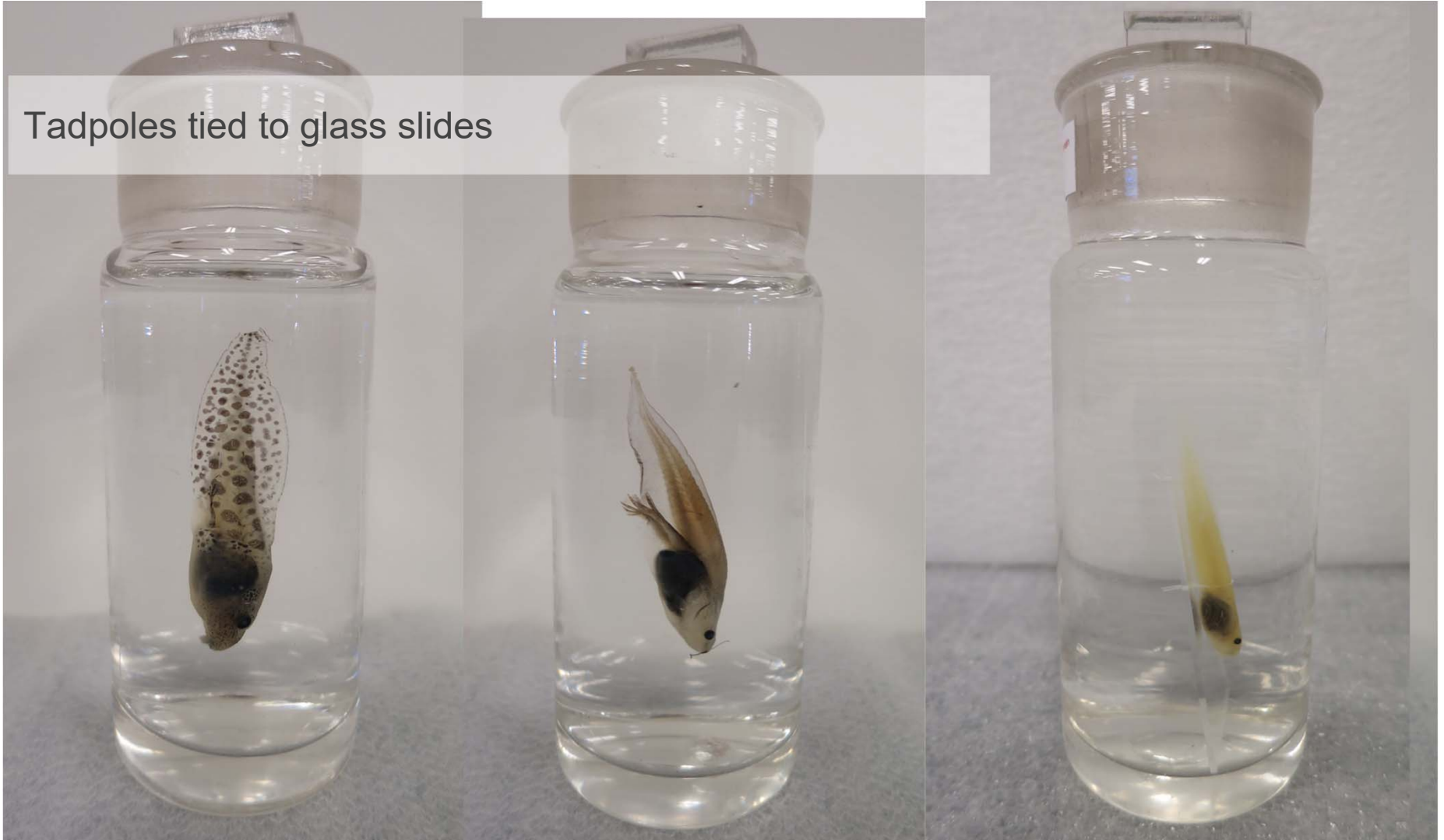


**Inside the jar:
tying it all together**



Alignment was important for these specimens

Tadpoles tied to glass slides



Filament stitched and knotted



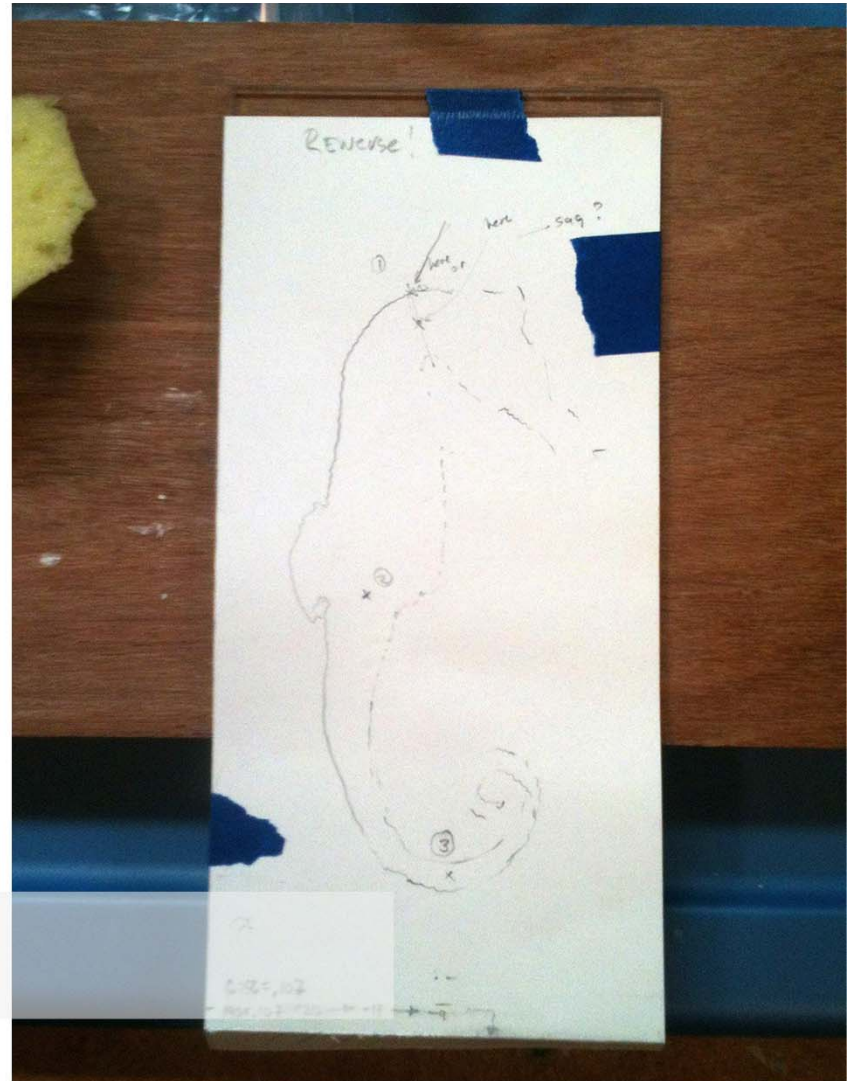


Non-cinching filament loops knotted on the back of the slide





Drilling templates

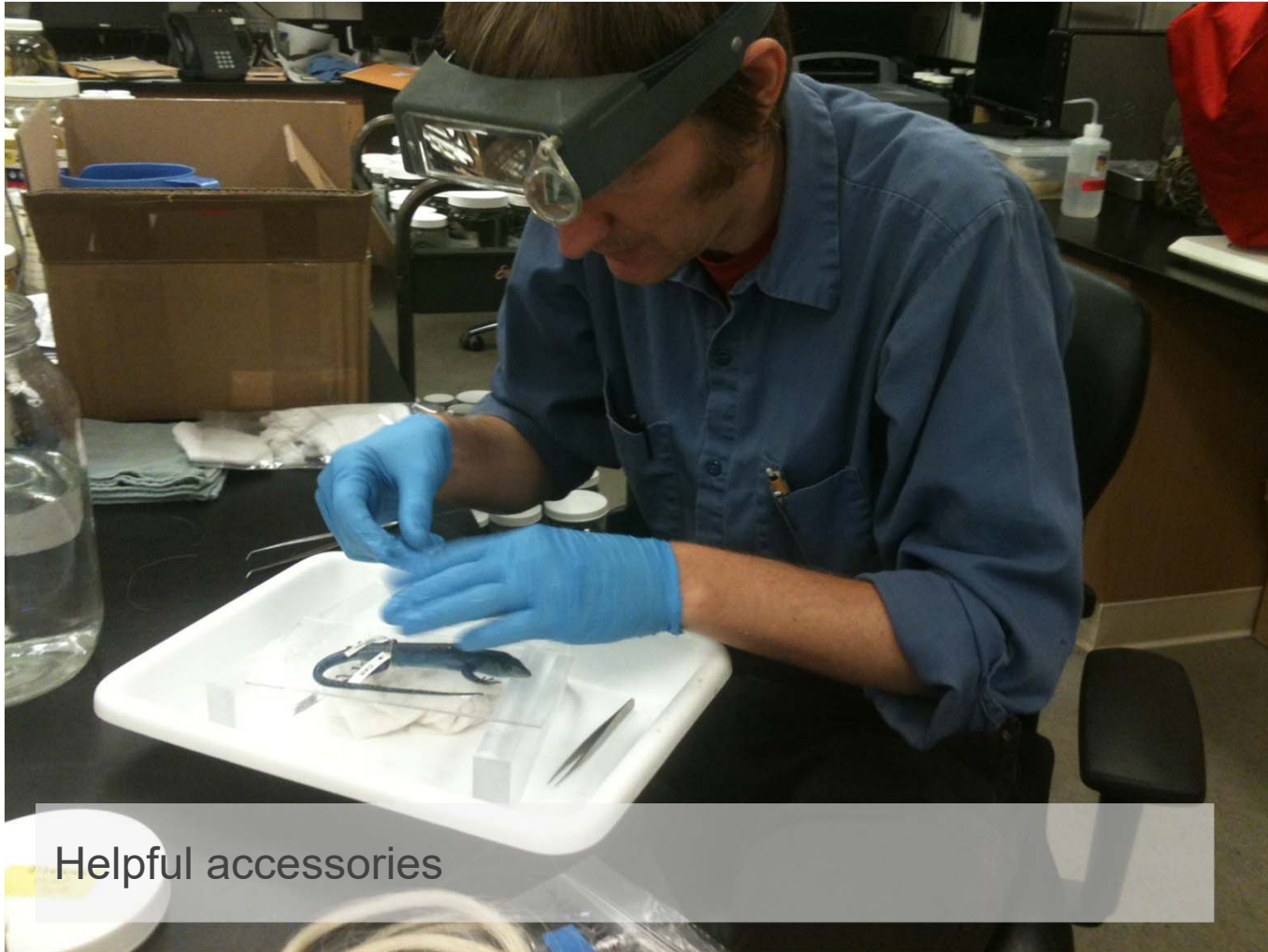




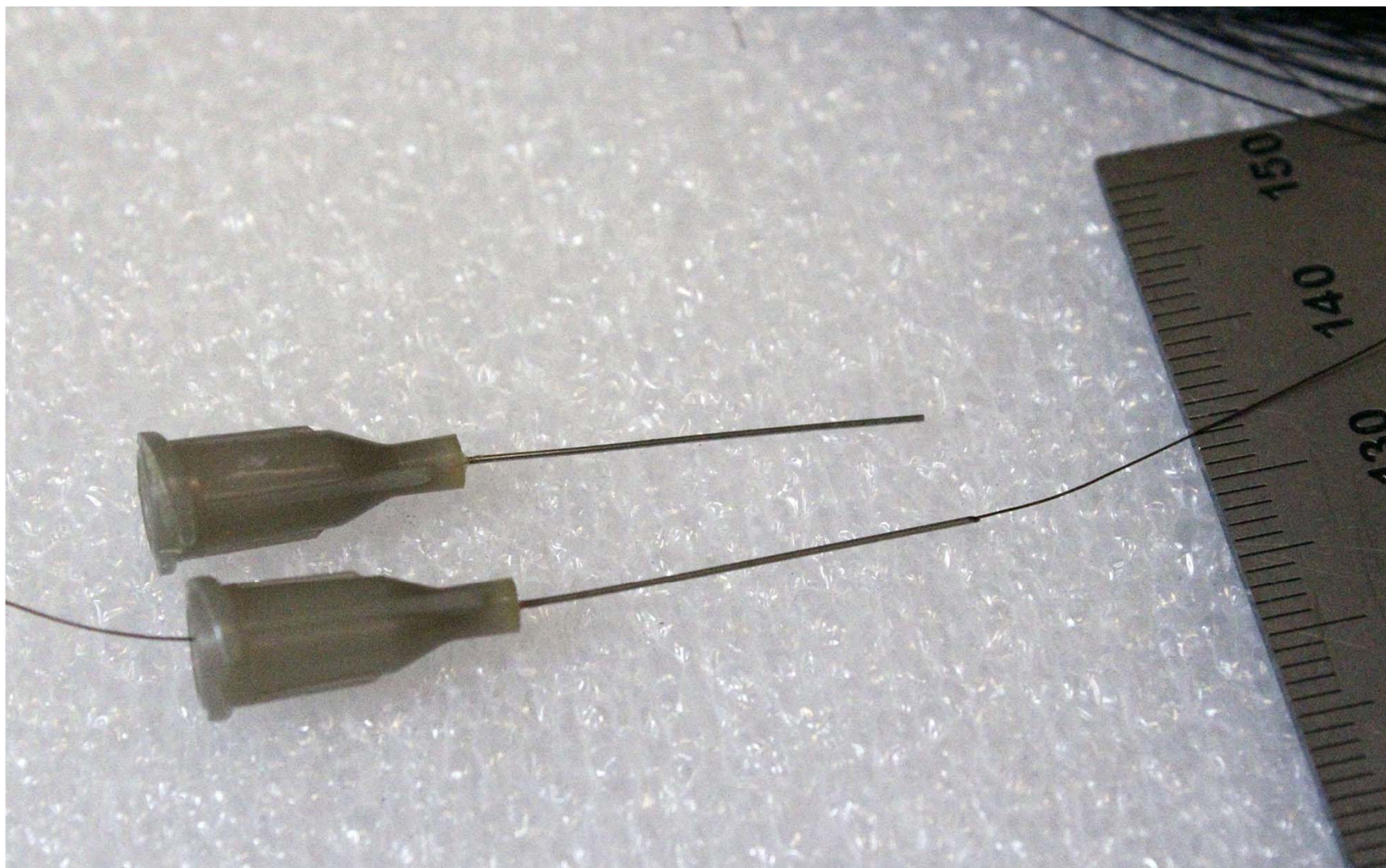
Diamond coated twist drill and burr



Horse hair is our filament of choice



Helpful accessories





Crepeline stocking for a small soft specimen

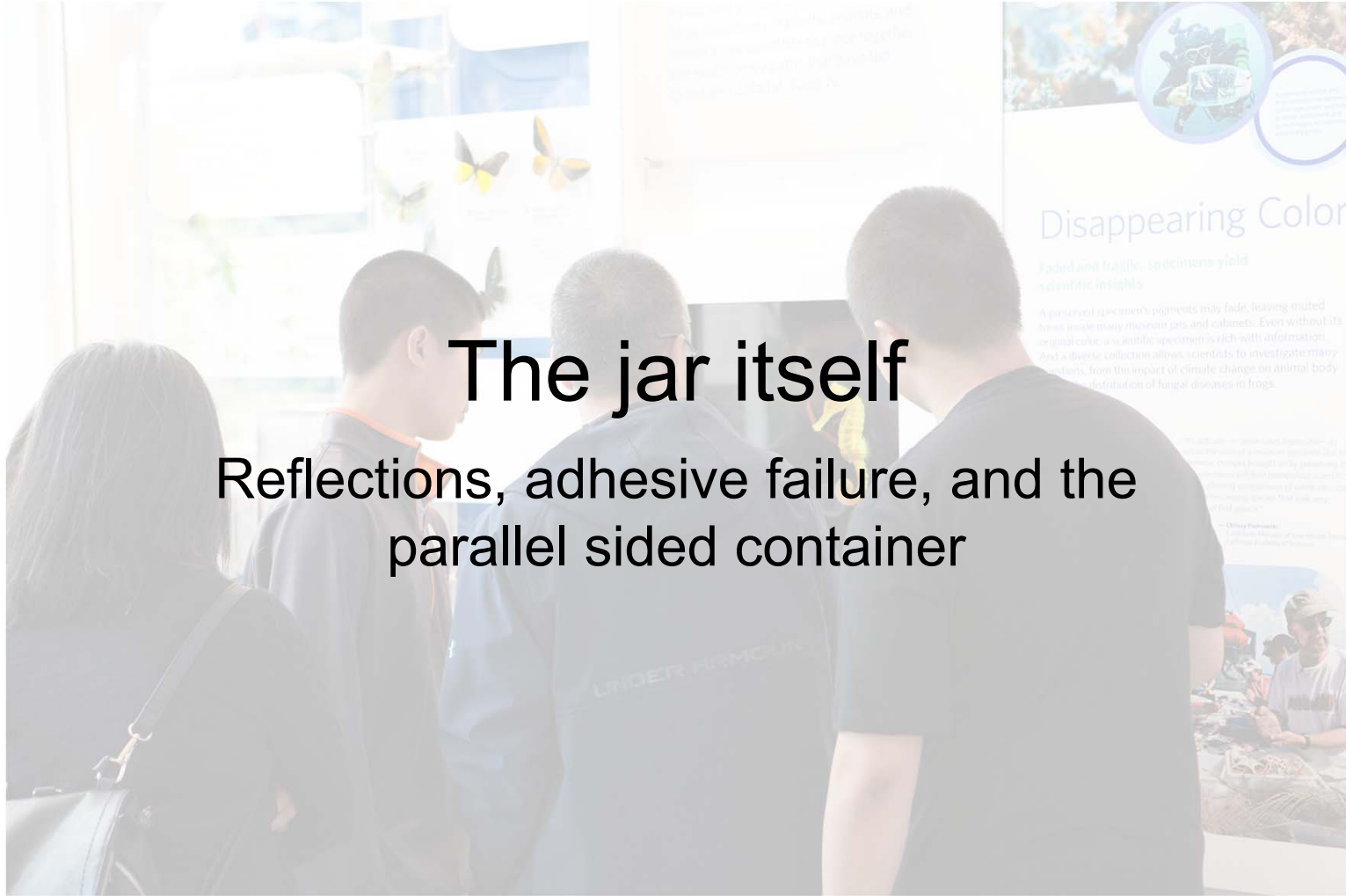


Thin hair silk attaches the stocking to the larger horse hair line underneath

In a jar







The jar itself

Reflections, adhesive failure, and the parallel sided container



Specimen cabinet window is a transparent interactive video screen



large collections of plants, and fossils allow scientists to piece together the evolutionary paths that have led to nature's colorful diversity.

Identified Clans



Colorful Pigments

Many organisms, called pigments and their hues, are visible on Earth. Plants and animals make these pigments to make themselves more visible or attractive to other organisms. Some pigments are used for camouflage, while others are used for warning. A colorful animal's appearance may be that it's beautiful.

Disappearing Color

Delicate and fragile, specimens yield scientific insights

Preserved specimen's pigments may fade, leaving muted colors inside many museum jars and cabinets. Even without its color, a scientific specimen is rich with information. A large collection allows scientists to investigate many aspects of an organism, from the impact of climate change on animal body structure to the evolution of fungal diseases in frogs.

It's difficult—in some cases impossible—to see the color of a museum specimen due to the changes brought on by preserving it. However, it still holds tremendous scientific value. Comparisons of subtle physical differences between species that look very similar.

Dr. Piotr Kozłowski
Manager of Invertebrate Zoology
Academy of Sciences



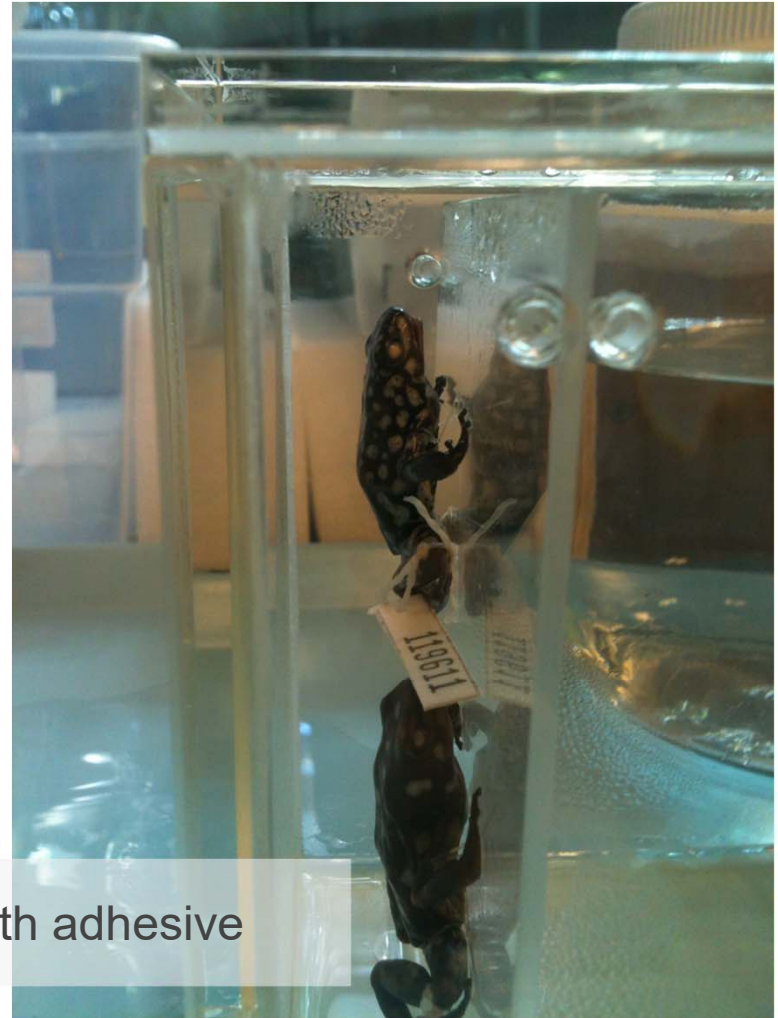
Media maps onto specimens in containers behind



Distracting reflections on cylindrical jars confuse the view



Plate glass jars diminish distracting reflections



First set of plate glass jars was bonded with adhesive

PRODUCT DESCRIPTION

LOCTITE® 349 UV Adhesive provides the following product characteristics:

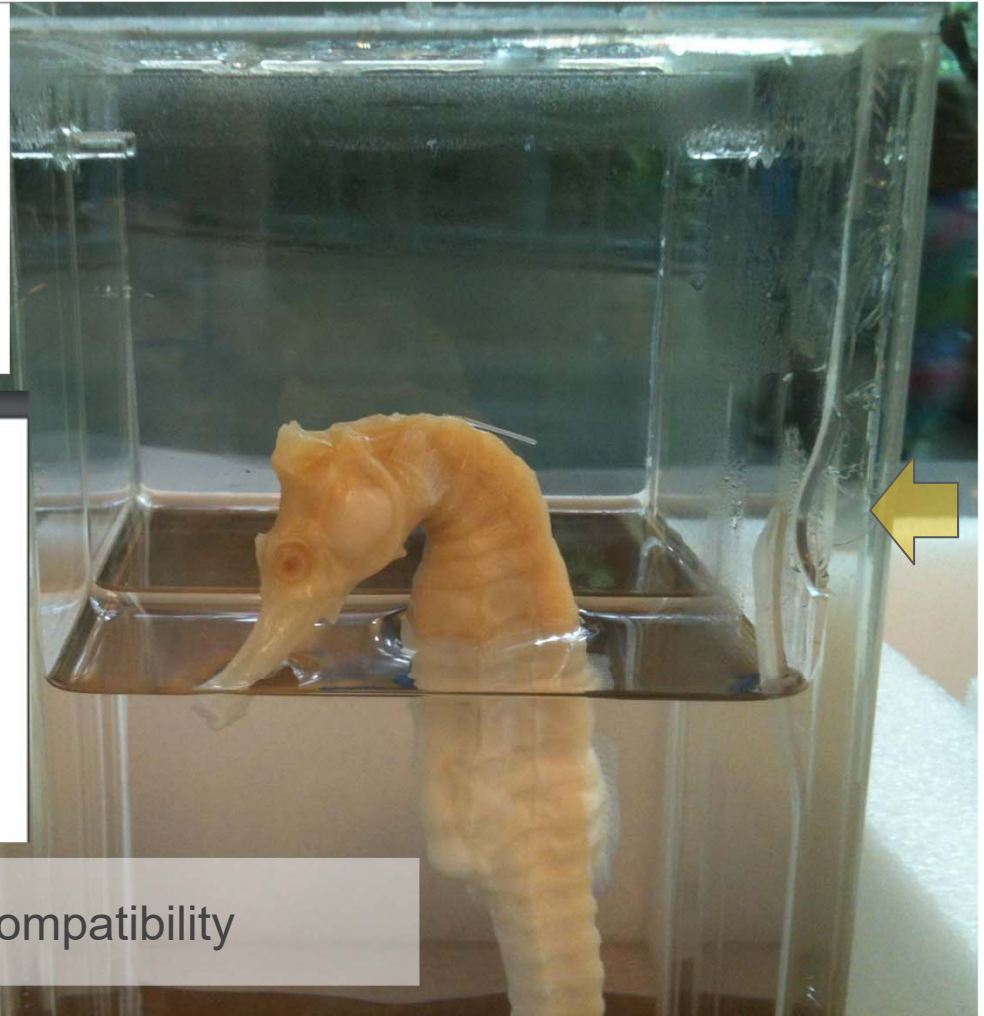
Technology	Acrylic
Chemical Type	Modified Methacrylate Ester
Appearance (uncured)	Transparent colorless to pale yellow liquid ^{LMS}
Components	One component - requires no mixing
Viscosity	Medium
Cure	Ultraviolet (UV) Light

TDS LOCTITE® AA 349™, September 2014

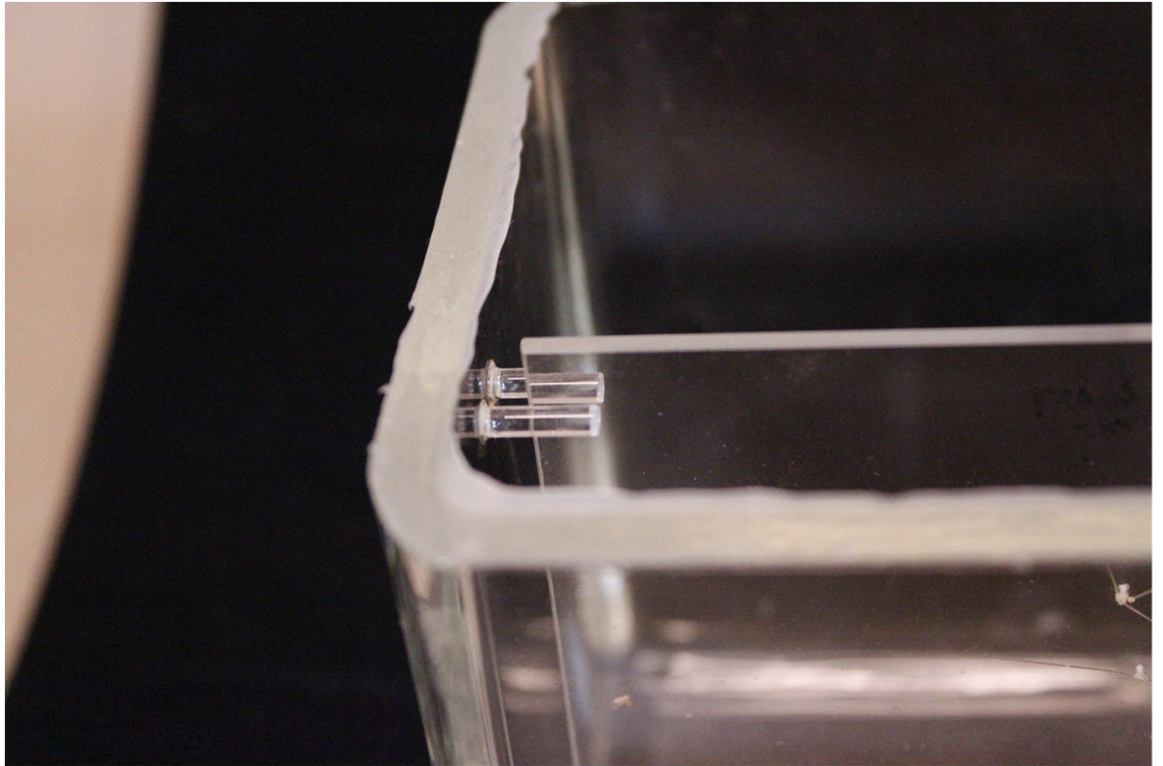
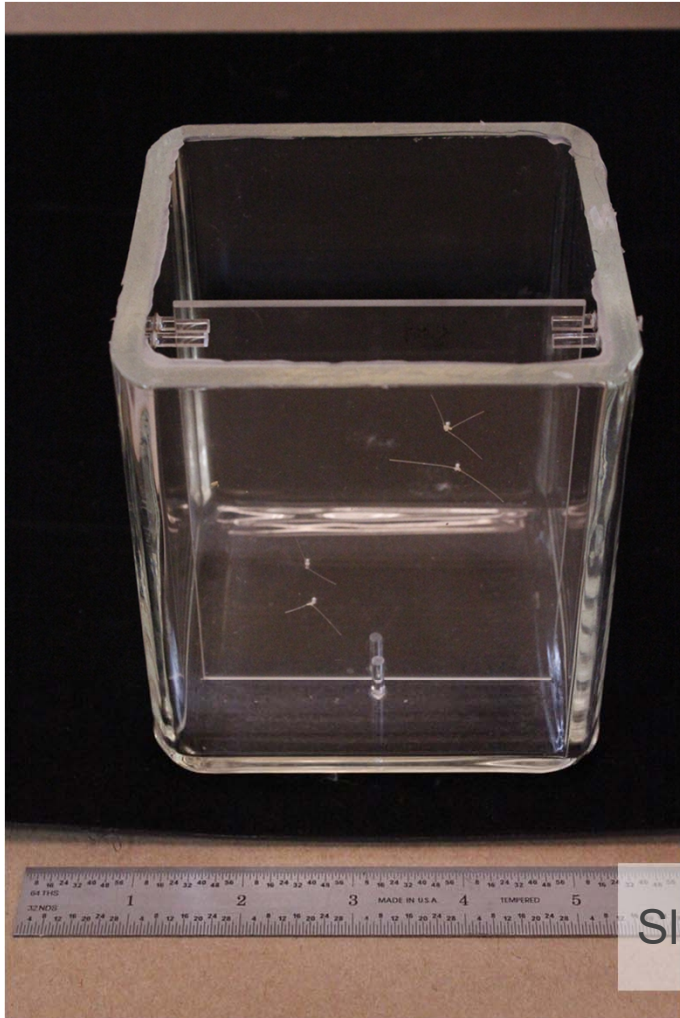
Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Gasoline	22	100	100	100
Freon TA	22	100	100	100
Industrial methylated spirits	22	100	100	100
Heat/humidity 90% RH	40	100	100	70

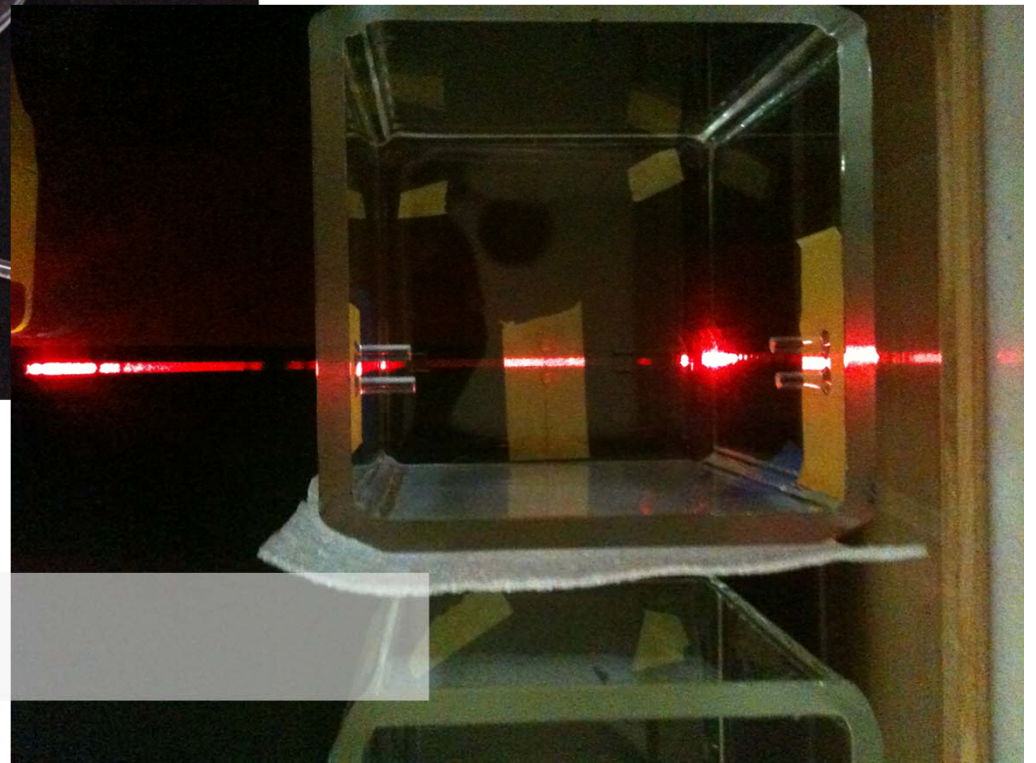
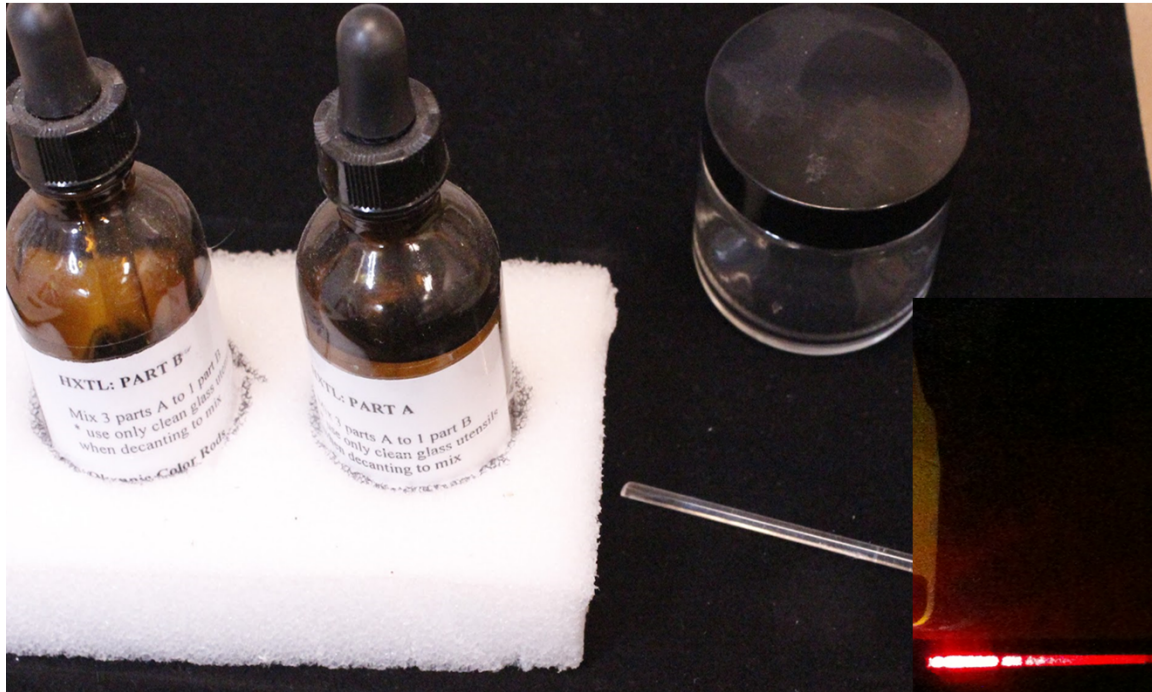


Adhesive data sheet didn't indicate incompatibility



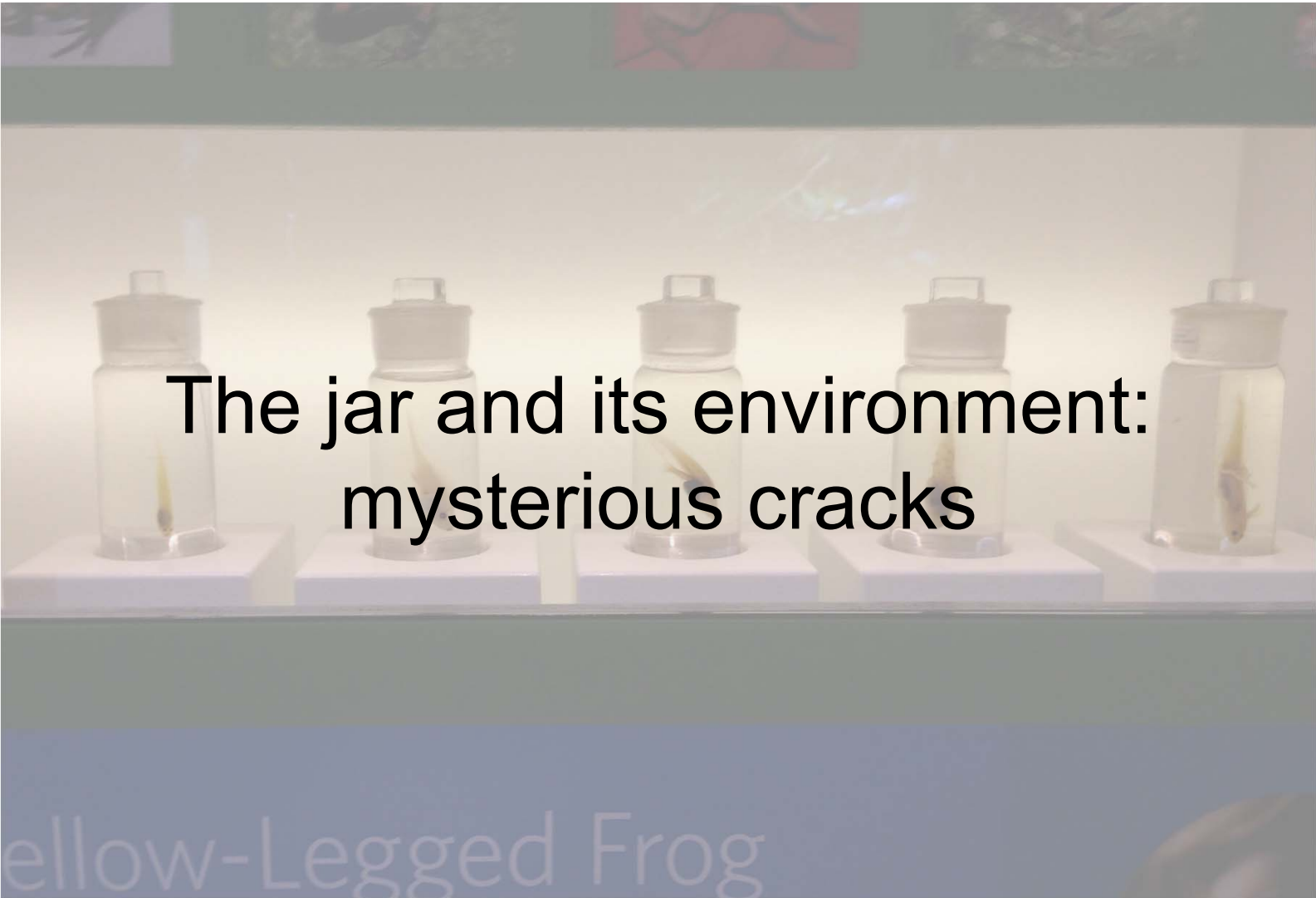
Slides need guides in containers with parallel sides





Guide peg glue; checking alignment



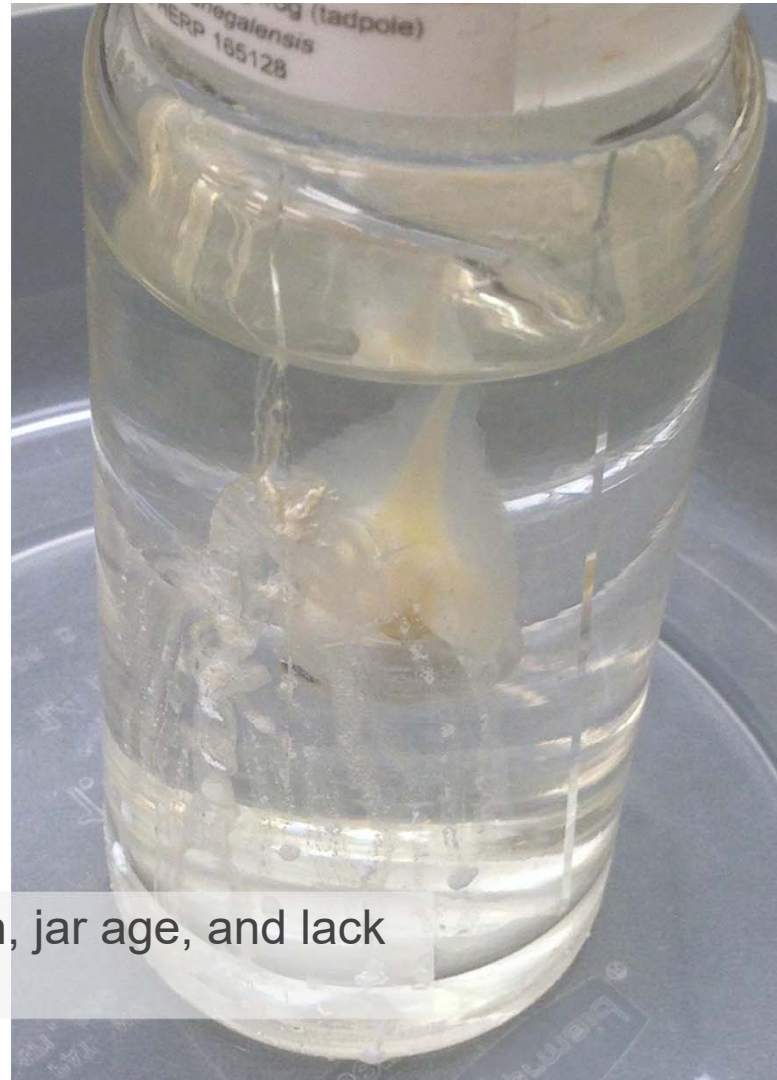
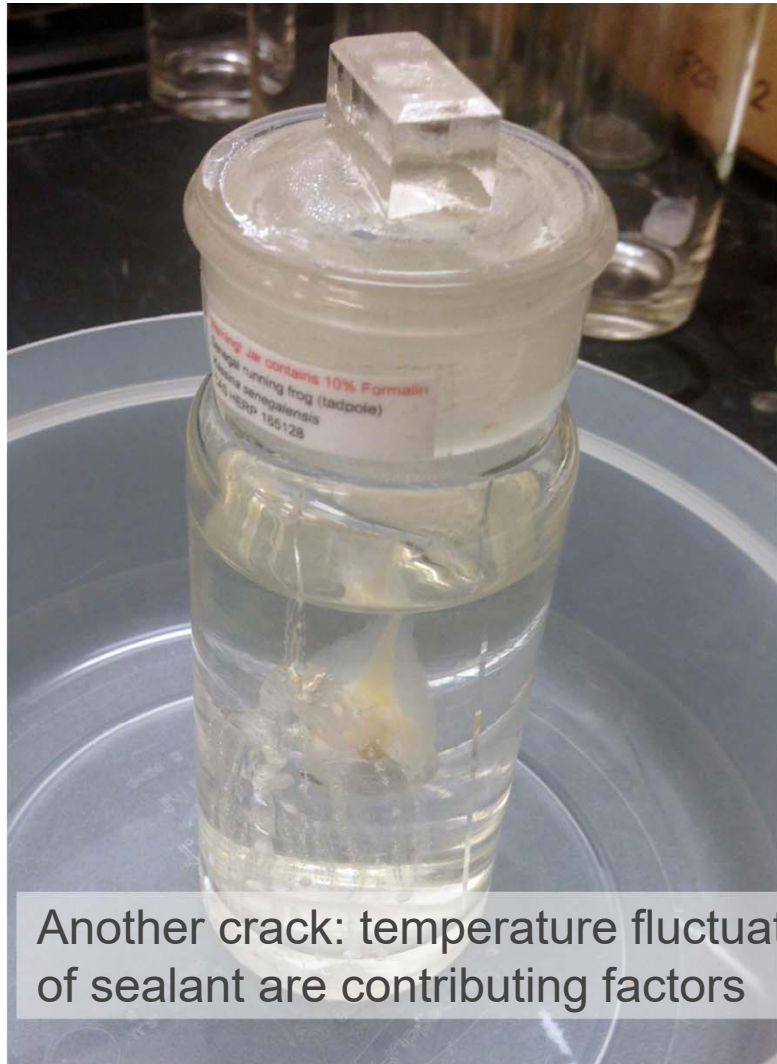
A museum display featuring five clear plastic jars, each containing a yellow-legged frog tadpole at a different stage of development. The jars are arranged in a row on a white surface. The background is a light-colored wall with a faint illustration of a frog. The text "The jar and its environment: mysterious cracks" is overlaid in the center. At the bottom, the text "ellow-Legged Frog" is visible, partially cut off.

**The jar and its environment:
mysterious cracks**

ellow-Legged Frog

A crack appears





Another crack: temperature fluctuation, jar age, and lack of sealant are contributing factors



New jar with mounting slide



Compounding the sealant



So far so good

Summary of considerations

Outside the jar:

- *Success* when the jar is supported to prevent tipping.

Inside the jar:

- *Failure* when acrylic is included. Many sources indicate PMMA is not soluble in either ethanol or water, *but that does not mean that it is insoluble in a water and ethanol mixture!*
- *Success* when we used glass props and used or adapted established tied-to-slide mounting techniques.

The jar and its environment:

- *Failure* when jar qualities interfere with clarity of presentation and object preservation.
- *Success* when close attention is paid to the qualities of the container (such as shape, material, age, and type of seal) and how they interact with the specimen and the display environment.

Contact

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Thank you

The Exhibits Studio, California Academy of Sciences

The Society for the Preservation of Natural History
Collections and NHCOLL-L

Tom Adams
Dave Catania
Elizabeth Kools
Dirk Neumann
Bob Maiden
Simon Moore
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Lauren Scheinberg
John Simmons
Jens Vindum
Kathryn Whitney

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Questions?

