Osteoscribing

Labeling bones

Back to Basics: Museum Techniques Skillshare
SPNHC 2022

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Museum minion | Science illustrator

--- University of Wisconsin–Madison Zoological Museum ---

Osteoscribe

Osteo = bone scribe = write

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Surface

Tool

Why label bones?

Permanent record of the catalog number, not compromised if the box is damaged

Increase **ease of use** in comparative studies

Ensure that specimens don't get mixed or put back in the wrong box

Drawbacks

Increase **time** spent in processing workflow

Potential to **obscure** small structures with ink

Some collections will just label the **skull only**.

Cleaning bones

Preparing the surface

Grease interferes with ink adherence to bone

Degrease beetle-cleaned bones with a series of soaks in water baths with **Dawn dish soap** (untinted is best) and/or combine with maceration.

Other degreasing agents (not a comprehensive list)

- Ammonia
- Hydrogen peroxide
- Acetone
- (This is an larger topic to expand - for next SPNHC!)

Cleaning bones

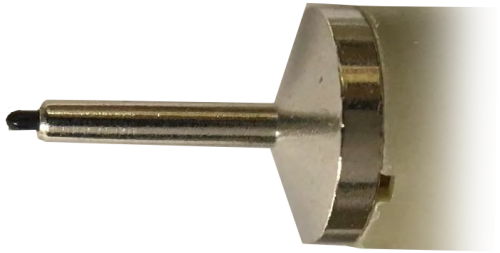
Soak - wait - soak again

Degreased is **not always** degreased

Deep grease **emerges** as the bones sit undisturbed for a few weeks, so sometimes bones need to be treated again, especially large animals and zoo animals

(Not all grease should be eliminated for structural stability)

Writing on bones

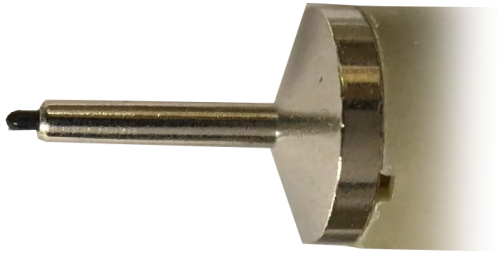


“Bone dust” (powdery fat residue) and residual surface grease can **clog the pen nib**

Periodically **roll the pen** on a scrap paper to unclog the fibers or barrel and get ink flowing again

Do this **before** assuming that the pen has run out, especially for Microns!

Writing on bones

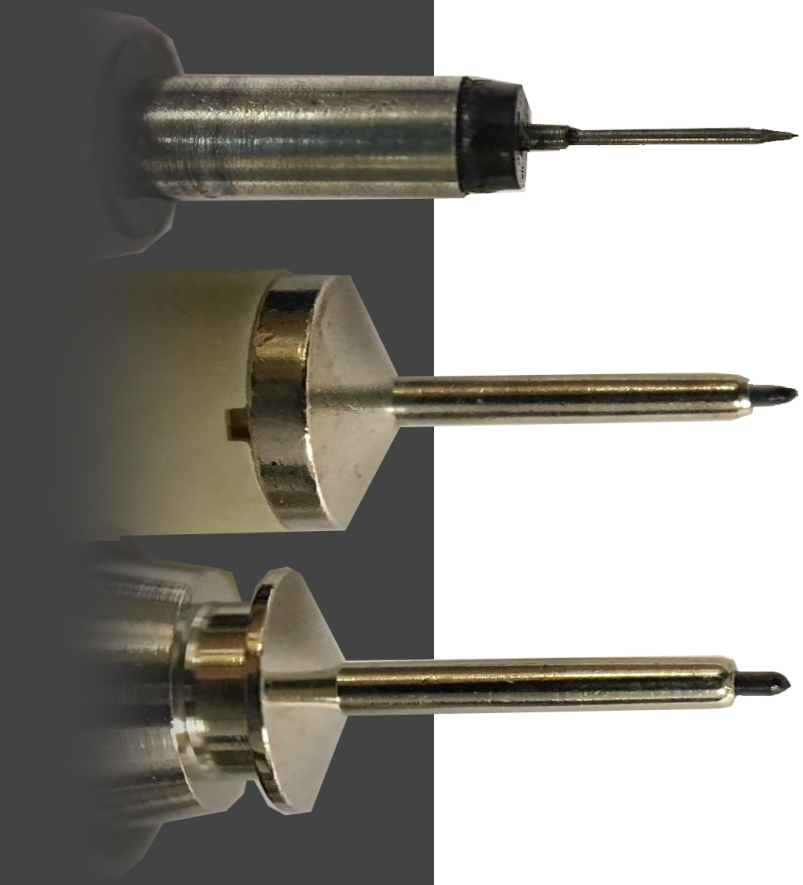


Can put a layer of **B-72** or another archival coating to seal the bone surface prior to writing

This does add **time**, especially when labeling the entire skeleton

While it addresses the issue of **writing on greasy surfaces** - the grease issue should really be addressed before the labeling gets underway

Types of pens



Archival ink ensures longevity of the label

Pen should have a **thin nib** for writing small labels

Longevity of the pen is important for budget concerns

Pen lineup

Felt/rubber

metal

Pen lineup


uni PIN 水性 FOR PRO
WATER PROOF AND FADE PROOF / PIGMENT INK
STAEDTLER pigment liner 0.05
FABER-CASTELL
PITT artist pen
MICRON 02
ARCHIVAL INK
QUALITÉ D'ARCHIVAGE
TINTA DE ARCHIVE
COPIC
MULTILINER SP
WATER & COPIC PROOF. PIGMENT INK
GRAPHIC LINE
PIGMENT INK
RAPIDOGRAPH
KOH-I-NOOR
TG1·S Faber-Castell
STAEDTLER
marsmatic700 3x0
rOtring rapidograph

Pen lineup


uni PIN 水性 FOR PRO
WATER PROOF AND FADE PROOF / PIGMENT INK
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Pen lineup

MICRON 02
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KOH-I-NOOR
TG1·S Faber-Castell
STAEDTLER
marsmatic700
3x0
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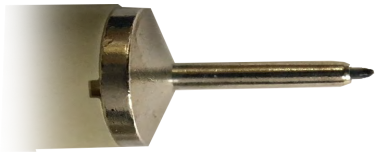
Pen lineup


PIGMA MICRON 02
ARCHIVAL INK
QUALITÉ D'ARCHIVAGE
TINTA DE ARCHIVE
COPIC
MULTILINER SP
WATER & COPIC PROOF. PIGMENT INK
RAPIDOGRAPH
KOH-I-NOOR

Pen lineup



Disposable
Micron
Less maintenance/training
Constantly replacing

Refillable
Copic
Tip still wears down
Higher initial cost

Very skinny nib
Fine line, clogs and/or bends more easily

Slightly thicker
More durable, still writes with a fine line with less pressure

Maintenance of drafting pens

Try to avoid **banging** the pen to get ink flowing - gently shake side to side to make sure weight and pin are still flowing

Store **cap down** and keep a small amount of Windex in the cap

Use pen **every few days** to keep ink flowing

Disassemble and rinse the pen completely before storing

Maintenance of drafting pens

DO NOT REMOVE the thin pin & weight from the barrel

Ultimately it is up to the **individual museum** to decide what will work best for the needs of their workflow for research and outreach.

Osteological Ink

Comparing pens for use in Osteology collections

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UW-Zoological Museum, University of Wisconsin - Madison

Wisconsin Insect Research Collection, University of Wisconsin - Madison

Introduction

Labeling bones with a catalog number is an essential practice within museum osteological collections. While archival ink types have been analyzed for best use, the question of which pen type is best is variable and subject to personal preference. This is often because the more desirable and higher quality pens for use on bone surfaces also come with drawbacks, such as frequent clogging or leaking while in use. Other pens, which may not be quite as high quality and therefore do not write on bone surfaces as well, especially when bones are greasy, may be more desirable because they continue to work without problems for a longer period of time, decreasing costs.

The University of Wisconsin Zoological Museum houses over 20,000 skeletons for research and teaching purposes in zoology and zooarchaeology. Labeling the bones within this collection with the appropriate catalog number is vital to the organization and care of the collection, as well as for any research conducted that utilizes the collection. In 2018 alone, over 300 skeletons were processed and labeled, so at this institution as well other many others, using proper high-quality archival ink and pens is crucial in maintaining the collections.

To generate a baseline comparison for archival pens, we examined longevity, price, quality of line, and usability on different bone surfaces. The pen selection reflects a range of traditional and modern options that include traditional drafting pens, refillable fineliners, and disposable pens that collectively represent a variety of nib type and size.

Methods

Archival ink pens were chosen based on familiarity of the brand, availability, and a review article recommending technical drawing pens. Sizes ranged from the very smallest available nib up to two additional larger sizes. The quill pen was chosen as a historical alternative, and Hunt 102 is a common fineline nib for dip pens. Technical pens similar to Rapidograph have many brands and we chose the one that is used most often at our institution. Other technical drafting pen brands would likely show a similar functionality in this particular osteological test.

Bones were selected based on their surface quality, using dry, clean wolf metacarpals to represent an ideal writing surface, and the greasy long bones of an unsoaked rabbit were chosen as a difficult writing surface. Both types of bones may be commonly encountered in labeling osteological specimens and the most efficient pens should be able to handle a spectrum of quality in specimen surfaces.

Longevity tests are valuable to gauge how long a new disposable pen may last. Using a new pen from each disposable line of pens, lines of a given length were drawn continuously until the ink stuttered and line quality deteriorated beyond usefulness and no longer revived after rest.

Pen Brand	Nib size	Unit cost	Clean bone	Greasy bone	Longevity	Nib	Pen	
Sakura Pigma Micron - 02	0.3 mm	$2.50			~ 20,390 cm			Plastic tip
Sakura Pigma Micron - 005	0.2 mm	$2.50						
Sakura Pigma Micron - 003	0.15 mm	$2.50						
Staedtler pigment liner 0.3	0.3 mm	$4.65			~19,500 cm			
Staedtler pigment liner 0.1	0.1 mm	$4.65						
Staedtler pigment liner 0.05	0.05 mm	$4.65						
Prismacolor Premier 01	0.3 mm	$2.44			~25,060 cm			
Prismacolor Premier 005	0.2 mm	$2.44						
Marvy's Le Pen Technical 4100 - 05	0.5 mm	$1.79			~12,710 cm			
Marvy's Le Pen Technical 4100 - 03	0.3 mm	$1.79						
Copic Multiliner SP - 0.2	0.2 mm	$10.50			Refillable			Felt tip
Copic Multiliner SP - 0.1	0.1 mm	$10.50						
Copic Multiliner SP - 0.05	0.05 mm	$10.50						
Faber-Castell Pitt Artist Pen S	0.5 mm	$2.82			~17,724 cm			
Faber-Castell Pitt Artist Pen XS	0.3 mm	$2.82						
Uni Pin - 02	0.33 mm	$1.65			~47,580 cm			
Uni Pin - 01	0.28 mm	$1.65						
Uni Pin - 005	0.05 mm	$2.45						
Ohto Graphic Liner - 01	0.4 mm	$2.65		*	~21,400 cm			Metal tip
Ohto Graphic Liner - 005	0.3 mm	$2.65		*				
Quill pen - Hunt 102 nib	0.1 mm	$2.95						
Rapidograph Koh-I-Noor - 3x0 .25	0.25 mm	$20.50			Refillable			
Rapidograph Koh-I-Noor - 4x0 .18	0.18 mm	$23.41						

* The Ohto pens would not initially write on the bones due to the rollerball construction, and the ink flow had to be restarted repeatedly in order for them to function. Would not recommend for osteological use.

Discussion & Conclusions

Selecting pens for osteological collections is integral to the workflow of cataloging and processing specimens. The UW-Zoological Museum processed 330 specimens in 2018 and 287 specimens so far in 2019. The average labeling time for a skeleton can vary depending on the species and size of the animal and the care needed for labeling tiny bones. Our institution labels nearly all of the bones with the catalog number, as long as the complete number can fit legibly. Labeling mammals can range from 2-5 hours, whereas birds tend to be 1-3 hours, and other skeletons may vary even more. If bones are greasy, they may require several passes with a pen
which can double or triple the labeling time required.

While almost all pens work well on clean bones, the true test was on greasier specimens (some bones do retain a slight level of grease for structural stability). In general the disposable pens were less successful in writing consistently and clearly, and while the bones are not exactly uniform for comparing, the general writing experience reflected this across the range. The best pens for greasy surfaces were metal-tipped technical pens and larger nibs tended to be more clear. Rapidograph technical pens make a bold mark on both surface types, but have a higher learning curve for maintenance and require continual use to prevent clogging. They are also more sensitive to accidental damage which can become costly.

Plastic and felt nib pens were more likely to clog with continual contact with greasy material and required more attentive maintenance. To

The longevity of disposable pens hinges on how long the nib lasts in a functional state. Near the end of its life, a pen may still have plenty of ink but the deterioration of the nib is the ultimate determining factor. The Uni Pin had a substantially longer working time than other disposable pens, and the LePen had the shortest.

Museum staff have many factors to consider when deciding what products are most cost-effective and provide the highest quality in osteological specimen labeling, so it is our hope that this comparison can provide a reference for making those decisions according to each institution's needs.

Acknowledgements

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