

FOSSIL PREPARATION IN A SMALL LAB: A CASE STUDY OF PREPARATOR TRAINING AT THE STERNBERG MUSEUM OF NATURAL HISTORY IN HAYS, KANSAS

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Abstract

Fossil preservation is exhaustive, meticulous, and demands knowledgeable specialists. In small museums, preparation staff can often be limited by the absence of tools, funds, and experience. This case study highlights the development and field-testing of preparatory resources to train students at the Sternberg Museum of Natural History. The Sternberg Museum has a backlog of fossils requiring preparation and a need for volunteers trained in fossil preparation, making it an ideal location. Over the course of four two-hour sessions, students learned techniques for assessing fossils and matrix, how to determine the appropriate tools, proper use of materials and tools, and molding and casting techniques. Qualitative assessments were based on final prepared specimens, knowledge of methods, and a final self-assessment. The course successfully trained volunteers and allowed for greater engagement with the public by consistently populating the preparation laboratory.



Figure 1: Left and right dentaries of a partially prepared mosasaurid in shale.

Introduction

To become a professional fossil preparator, one must progress through both training and an apprenticeship. Neither the training nor apprenticeships are standardized, however, leaving novices without regular checkpoints in their progress. Though a small number of museums and institutions offer training or apprenticeships, the course length and structures are varied. Without standard manuals, books, or tests it becomes impossible to know the completeness of a student's knowledge or their level of competency. By creating a laboratory and teaching manual, a consistent process and gauge is established for all members of the community to compare to. The tools presented in this research are invaluable to all institutions that wish to enhance existing or implement new fossil preparation training programs. By catering techniques and programs to different learning styles, training can be customized to educate the greatest number of people.

Methods

1. Review training programs from various institutions.
2. Create composite lab and teaching manuals.
3. Prioritize topics/themes to focus on.
4. Choose specimen(s) for preparation.
5. Determine the final purpose of the specimen.
6. Organize session materials and supplies.
7. Determine the range of learning styles in individual students.
8. Teach each topic using three primary techniques: verbal instruction, demonstration, and student practice.
9. Quiz students on progress, understanding, and comfort with topics.



Figure 2: Associated *Cretoxyrhina* vertebral column.

Findings

Upon completion, students were able to:

- Assess matrix and tissue
- Choose appropriate consolidants
- Choose appropriate tools
- Use hand and pneumatic tools
- Adhere broken fragments
- Create molds and casts of fossils
- Prepare various specimens



Figure 3: Fossil preparation laboratory at the Sternberg Museum.

Conclusions

Although it was hypothesized that tactile learners would progress most successfully through the course, higher total scores correlated to visual learners. Auditory learners were the most confident in their skill set after the end of the course, visual learners were the most meticulous by the end of the course, and tactile learners were the quickest to become comfortable with the tools and techniques. Auditory learners absorbed information best through verbal and physical demonstrations, visual through figures and written instructions, and tactile through practice and comparative anatomical figures.



References

- Brown, M. A., A. Davidson, M. Fox, S. Jabo, and M. Smith. 2012. Defining the Professional Vertebrate Fossil Preparator: Essential Competencies. Society of Vertebrate Paleontology, 8 pp.
- Converse, H. H. 1984, rev 1994. Handbook of paleo-preparation techniques. Florida Paleontological Society, University of Florida, Gainesville, Florida, 109 pp.
- Jabo, S. J., A. Telfer, M. A. Brown, P. Reser, M. E. Smith, and M. Holland. 2010. The Smithsonian Institution's Exhibit Fossil Preparation Lab Volunteer Training Programme Part I: Design and Recruitment. The Geological Curator, 9(3):169-178.
- Leiggi, P. and P. May. 1995. Vertebrate Paleontological Techniques, Volume 1. Cambridge University Press, New York, 344 pp.

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