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Preliminary Report on Professional Development in Vertebrate Fossil Preparation

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Introduction

Common complaints by workers in the field of fossil preparation include lack of appropriate pay, lack of acknowledgement, lack of safety controls, and lack of respect from the greater paleontological community (sometimes represented by the phrase "just a preparator"). Some of these issues have persisted since the early days of paleontology (Brinkman, 2009). Many of these complaints can be addressed through the process of further professionalization of the field and continuing professional development of the individual.

In addition to promoting the individual worker, another aspect of professionalization is guaranteeing the quality of work produced. According to Horner (1994), "Vertebrate paleontology... is a field of study where the accuracy of collection and preparation of specimens and data is the foundation that determines the ultimate quality of the science."

This perspective highlights the fact that on the frontlines of data collection, the role of the fossil preparator is critical, fundamental to the quality of the science of paleontology. Therefore we must hold ourselves to the highest standards that we can create. Most preparators do that individually, but how do we ensure that goal as a profession?

Bodies responsible for the care of fossils call for skilled preparation, for instance, the Society of Vertebrate Paleontology Bylaws Article 12 Section 3 (SVP, 2002) states "Fossil vertebrate specimens should be prepared by, or under the supervision of, trained personnel." The National Park Service (NPS, 1991) goes one step further, Directive 77-Paleontological Resource Management Policy states that, "Fossil preparation is a specialized subdiscipline of paleontology and preparation should only be performed by professionals with suitable training."

These statements lead some to ask, who qualifies as trained? What does that "suitable training" even mean? As a group of content specialists, it is up to our community to define "suitable training." This report will briefly outline some methods used in this field to date, present an overview of professional development in selected similar fields, and suggest one model for continuing development within vertebrate fossil preparation.

Existing Strategies

Currently there is no overarching plan to professionalize the field that is well accepted or enacted by a majority of fossil preparators (Brown and Kane, 2008). Attempts to individually control quality and professionalism are widespread, and include management or institutional training, workshops and sessions at professional meetings, and publishing.

Preparators are responsible not only for exposing information about fossils, but also for minimizing loss of data. In most labs, a chief preparator or volunteer coordinator typically controls quality, in addition to the research staff for whose work the quality of data is ultimately dependent.

Some institutions have a formal training program, like the Denver Museum of Nature and Science, and a number of institutions have modeled programs on the DMNS. Typically these programs are geared toward volunteers, and weeding out early those without the long-term interest or ability to succeed in the lab (Carpenter, K. pers comm. 2008). For the most part, the skills required to prepare fossils can only be gained by doing; making an 'apprenticeship' of sorts the primary factor in learning. Theoretical knowledge is typically passed on by word of mouth.

The Field Museum of Natural History issues a skills test to volunteers and new employees before they can work in the laboratory (Bergwall, 2008). Called "the prep test," this examination was instituted to evaluate initial skill level and potential for new workers. Some lab supervisors, including this author, issue a similar skills examination before accepting new volunteer positions.

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While there is a large body of information available regarding preparation methods, it can be difficult for a novice preparator to locate, and more importantly, to evaluate. It may take many years to build a suitable reference library.

Preparators currently share information through conduits like the Society of Vertebrate Paleontology (SVP) Preparators Pages at the vertpaleo.org website, and Society for Preservation of Natural History Collections publication series. For example, a number of recent SVP platform and poster presentations are available on the SVP website in pdf format, in addition to an FAQ section and Short Papers.

The existence of the SVP prep committee itself is due to the hard work of many people who cared deeply about the importance of fossil preparation. The resulting website, preparators demonstration table, grant money, and promotion of the prep symposium to a regular session at SVP meetings are great advances professionally.

In April of 2008 Petrified Forest National Park hosted the first of an annual series of preparation-specific conferences, with locations already set for 2009 and tentative for 2010. There is also a rapidly growing internet presence in vertebrate paleontology preparation, through websites, mailing lists and discussion forums, including the SVP Preparators Resources page, www.fossilprep.org, and the vertebrate preparation discussion "preplist."

Professional Development in other Fields

Looking at other professions as models, steps can be identified to institute further professionalization of fossil preparation. Though there are many relevant organizations, two professional organizations from similar fields have been selected to elaborate upon as models for development; the American Institute for Conservation (AIC), and the Association of Medical Illustrators (AMI). The work of the objects conservator closely mirrors the duties and responsibilities of fossil preparators. The AMI represents a highly specialized group of artists whose work is similarly critical to the medical profession, in both research publication and visual explanation to the layman.

AIC—The AIC has developed a system of standards and code of ethics (AIC, 1994) to ensure and enhance professionalism in their field. For example, in order to define the Conservator, the AIC created a task force to consider "an individual at the very inception of his or her professional career... to identify the competencies that... can be regarded as fundamental to the definition of the conservator." (AIC, 2003:4).

This task force defined 12 essential competencies, and emphasized that "possessing each competency is not in itself sufficient, but that to be a qualified conservator one must utilize these competencies synergistically to maintain the standards of practice required by the profession." (AIC, 2003:5). Beyond having a basic knowledge in these areas, it is critical that the worker posses a proficiency in them.

The AIC also publishes the Journal of the American Institute for Conservation (JAIC), and hosts conferences and workshops for the benefit of conservators. Membership in the AIC takes place at several levels, as a way to offer additional credential to the individual conservator.

AMI—The Association of Medical Illustrators follows a similar model, existing to promote the field of medical illustration, encourage the individual illustrator, and offer increased quality control to the field as a whole. The AMI also supports a Board of Certification that offers evaluation and qualification of practicing illustrators. This board "is an independent body that administers this voluntary certification program designed to provide the practicing medical illustrator with the recognizable and valuable CMI (Certified Medical Illustrator) credential." (AMI, 2008).

Through these methods, the professional bodies are acting to help ensure the level of quality and professionalism available to those who employ or utilize the services of working professionals, as well as increase the benefits available to the professional in compensation for their skills and knowledge. These groups can provide guidelines for minimum safety controls for employers, to ensure the best interest of the institution, employees, students, volunteers, and possible customers.

Graduate programs also exist at numerous trade schools and universities for both of these professions. The professions define what a 'trained' or competent practitioner is, aid in the creation of training programs, and evaluate professionals practicing in the field.

Proposed Model for Vertebrate Fossil Preparation

Support of an Organization—Essential to the success and development of other professions is the existence of a professional organization. The professional body (or bodies) is the primary

vehicle through which development and regulation takes place. Through organization of conferences, continuing education programs, development of a code of ethics, and enforcement of those standards and ethics, the organization thus raises the visibility and esteem of the profession. Due to increased educational opportunities, both the number of professionals and the quality of work then increases, making the individual more attractive and competitive in their institution and the field.

To date, the SVP preparators committee has played a vital role in professional development of preparators, and has the mission to "coordinate activities relevant to preparation of fossils at the annual meeting and during the year through a listserv. These activities include a preparation symposium or session and staffing of a preparation demonstration table at the annual meeting and coordinating the information about preparation on this web page of the SVP website" (www.vertpaleo.org). A separate body would not presume to replace the efforts of the preparators committee, but to support them and reinforce them. While it is incredibly important to have a group working within the society to represent preparators, it is equally crucial to have an outside advocacy group as well, that can promote both the individual and the community.

This report follows others (e.g. Brown and Kane, 2008; Madsen 2008) in advocating the creation of a professional association. This "Association of Fossil Preparators" (AFP) would work parallel to the SVP preparators committee with the goals of increasing the visibility and esteem of the fossil preparator, organize preparation specific conferences, facilitate training and continuing education, provide standards and recommendations to employers, endorse certification programs, and advocate standards of professionalism and competency.

Training—Informal training options should be supported, continuing programs similar to those at DMNH and many other labs. Advances in formal training programs should be pursued as well. The author has recently participated in two such programs, one in partnership with Petrified Forest National Park (PEFO) and California State University, San Bernardino (Brown et. al, 2008), and another as a contractor for the FossiLab Volunteer Training program at the National Museum of Natural History (Brown et. al, in prep). Both of these programs developed a semi-formal curriculum, and sought to impart both theoretical knowledge and training in mechanical techniques. Participation in the NMNH training program is necessary for new volunteers, while interns in the PEFO/Cal State program received both internship and science independent study credit.

Future work with higher education institutions is encouraged to develop accredited degree programs and apprenticeship opportunities.

Professional Certification Program—One avenue for raising the profile and esteem of the individual professional is through the establishment of a professional certification (Kane and Brown, 2008). Using the standards established by the professional society, a certification board is appointed or elected, who develop requirements for eligibility, and create a method for testing those requirements. While there is much theoretical knowledge to master in preparation, proficient mechanical skills are most important to success at the workbench. Receiving an AMI certificate requires a review of the candidate's professional portfolio by a panel of expert referees. This review process can easily be adapted to fossil preparation.

According to the National Organization for Competency Assurance (NOCA), a body originally created by the U.S. Congress to develop standards and certification for Health and Human Services, certification of professionals promises (NOCA, 2009):

- Higher wages for employees in the form of bonuses, education assistance or higher salary.
- A more productive and highly-trained workforce for employers.
- Prestige for the individual and a competitive advantage over noncertified individuals in the same field.
- Enhanced employment opportunities.
- Assisting employers in making more informed hiring decisions.
- Assisting consumers in making informed decisions about qualified providers.
- Protection of the general public from incompetent and unfit practitioners.
- Establishment of a professional standard for individuals in a particular field.

This process is especially relevant for fossil preparators, since the field currently lacks any type of credentialing that reflects the skills and knowledge required for competency. A model for certification of preparators based on relevant similar professions would begin when qualified members of the preparation community create a board of certification, develop eligibility requirements, and write and update an examination of skills. Then a professional, who has reached a certain level of work and educational experience (e.g. two-seven years), would submit to a standardized written examination of knowledge, and assemble a portfolio of specimens (two or three), which would include photo documentation of the preparation process, along with a written rationale for methods applied. The applicant would describe chemicals and methods used in the process; whether they adhere to professional standards; and, if they deviate from accepted standards, provide a justification for the use of nonstandard methods. Upon successful scoring of the exam and portfolio, the applicant would be designated as a board certified fossil preparator. For example, a certified fossil preparator should be able to demonstrate knowledge of basic geology and biology concepts, knowledge of vertebrate anatomy, (ed.'s note: and invertebrate anatomy?), understanding of conservation principles, familiarity with chemical properties, and the ability to properly document specimen history.

Certification would be renewed periodically (e.g. three-five years), conditional upon completion of a specified number of continuing education or professional service credits. For example, presentation at a professional meeting, publication of a technical paper, attending or teaching workshops, field work, x number of hours of professional employment, college level classes, teaching experience, public outreach, etc., would all qualify for credits. Renewal ensures that the preparator is maintaining a professional skill level, keeping up with current preparation theory, and contributing meaningfully to the development of other preparators.

Conclusion

While it is important to note that many institutions already address issues of training and quality control individually, advances for workers will develop most quickly if a body exists to codify such solutions, to evaluate them regularly, and to work to make them universal. The experience of other occupations readily demonstrates the benefits to this process. Not only would there be eventual increases in salary and professional esteem, but quality of care of fossil specimens, our primary duty, would also improve.

An ideal simplified model for the preparation community includes a professional organization operated solely to represent the interests of the profession; standardized formal and informal training opportunities for professionals, students, and volunteers; and field-wide methods for evaluating and certifying competent preparators. Details of these elements will be greatly expanded upon in future work, and are subject to the input of the community as a whole. The author strongly encourages input from the community.

The steps outlined in this document are not intended to take place immediately, and concrete results would be expected over a period of years. Additionally, all aspects of the process are not required to be in place or polished at inception, professional development is very much an evolutionary program, the most important factor being that it has a beginning.

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