PAPERS

THE EFFECTS OF FREEZING ON FORMALIN PRESERVATION OF SPECIMENS OF FROGS AND SNakes
NORMAN J. SCOTT, JR., AND AIDA LUZ AQUINO-SHUSTER
National Ecology Research Center, U.S. Fish and Wildlife Service, Department of Biology, University of New Mexico, Albuquerque, New Mexico 87131 (NJS); Department of Biology, University of New Mexico, Albuquerque, New Mexico 87131; Present address: Museo Nacional de Historia Natural, Asunci6n, Paraguay (ALA)

Abstract - Fresh specimens of the wandering garter snake and northern leopard frog were killed and divided into three groups. One group was kept frozen and one kept under refrigeration for five days before preservation in 10% formalin. The remaining group was preserved shortly after killing. After four months of storage in preservative, there were observable differences in the quality of the specimen condition.

DOCUMENTATION GUIDELINES FOR THE PREPARATION AND CONSERVATION OF BIOLOGICAL SPECIMENS
KIMBALL L. GARRETT
Section of Ornithology, Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, California 90007

Abstract - The importance of complete and accurate documentation of preparation and conservation treatments was stressed by Fitzgerald (1988) for the earth sciences, and is reiterated here for the life sciences. The guidelines presented herein represent an effort by the Conservation Committee of the Society for the Preservation of Natural History Collections to promote and standardize the documentation of specimen preservation methodologies, conditions, and treatments within natural science collections.

INTEGRATED PEST MANAGEMENT AT THE DENVER MUSEUM OF NATURAL HISTORY
ELIZABETH A. WEBB, CARL PATTERSON, CARRON A. MEANEY, AND BRYCE SNELLCROVE
Zoology Department (EAW, CAM), and Exhibits Department (BS), Denver Museum of Natural History, City Park, Denver, Colorado 80205; Rocky Mountain Regional Conservation Center, 2420 South University, Denver, Colorado 80208 (CP)

Abstract - The Denver Museum of Natural History recently suspended regular use of toxic fumigants in the zoology research collections and substituted an integrated pest management program consisting of specimen monitoring and localized fumigation of infested cabinets. A bird conservation survey provided baseline information on the physical condition of specimens in the collection, evidence of dermestid beetles, and targeted specimens in need of conservation. The museum also expanded protection of exhibited zoological specimens by instituting
systematic conservation audits, basic cleaning, and pest management, involving regular monitoring and use of low-toxicity insecticides and insect traps in dioramas.

**COLLECTION AUTOMATION: TAILORING DATABASE AND COLLECTION MANAGEMENT TO SUIT A NATURAL HISTORY COLLECTION**  
SUSAN M. WOODWARD  
Department of Mammalogy, Royal Ontario Museum, 100 Queen's Park Crescent, Toronto, Ontario M5S 2C6, Canada

Abstract - Automating natural history collection data can have far-reaching effects on collection management. It is vital that the planning of a system include appraisal of present and possible future uses of the data (on-line and as output). The software's limitations also need to be considered. A number of important issues to consider include database management requirements such as: (1) standardization of terminology, (2) updating data, (3) use of catch-all fields and unique fields, (4) conventions and use of term characteristics to produce desirable hardcopy products, and (5) data quality requirements (including precision, accuracy, use, and coding of data). Collection management issues involve organization of the collection and how it can be improved by implementing user-based hierarchies. Finally, documentation, along with gathering of data, and training of personnel are briefly discussed.

**A CODING SYSTEM FOR NATURE OF SPECIMEN FOR RECENT MAMMAL COLLECTIONS: MIXING DOCUMENTATION NEEDS, TRADITION, AND COMPUTERS**  
SUSAN M. WOODWARD  
Department of Mammalogy, Royal Ontario Museum, 100 Queen's Park Crescent, Toronto, Ontario M5S 2C6, Canada

Abstract - A coding system to describe the nature of Recent mammalian specimens is presented. It addresses human and computer restrictions while remaining flexible and expandable. A single term is comprised of two parts, a primary descriptor and a secondary descriptor, that are separated by a hyphen. The primary descriptor of this code indicates the parts of a specimen that have been prepared. The secondary descriptor of the code indicates the preparation methods used. Several terms may be required to adequately describe a specimen. Standardized terminology used to describe the condition of a specimen for collection management purposes is also presented. Useful, unique, and consistent strings are the optimal goal from a perspective of computer compatibility.

**Reviews**

- Materials for conservation, by C. V. Horie  
- Conservation of natural history specimens: Spirit collections, by C. V. Horie, ed  