A Method of Combined Skin-Fluid Specimen Preparation

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A number of authors have outlined methods of preparing birds as combination skin-skeleton preparations (Johnson et al. 1984, Dickerman 1989, Garrett 1989, Spaw 1989). But we know of no mention of combined skin-fluid specimen preparation. Although the advantages of such specimens may seem obvious, for too many workers a skin-fluid specimen means preparing a conventional study skin and storing the body in spirit.

Whole fluid-preserved specimens have both advantages and disadvantages. Although the entire body is retained, permitting skeletons to be removed later, the preservative may alter plumage color (e.g. Fry 1985). Standard study skins can yield important skeletal elements, but information on soft tissue is essentially lost (Olson et al. 1987). Bodies (trunks) removed during skinning can be stored in fluid to preserve the internal organs, but they may sustain severe damage to the appendicular myology, which renders them virtually worthless for limb dissection. We modified one of the skin-skeleton techniques to allow preservation of a study skin and a nearly complete representation of muscles for fluid preparation.

A method presented by Johnson et al. (1984) retains one wing, a leg, and the skull with the entire trunk for skeletonization, while the other wing and leg re-

Fig. 1. The two parts of a combined skin-fluid specimen of Albert's Lyrebird (*Menura alberti*) prepared by N. W. Longmore. This specimen is the only representative of this species preserved in spirit; none were listed by Wood et al. (1982).

main with the prepared skin. From this general approach, we have been able to obtain a "naked" body suitable for fluid preservation.

An initial incision is made either down the center line of the underside or along the flank from the shoulder to near the cloaca. This and all subsequent cuts must be made carefully and without excessive penetration to avoid soft tissue damage. The skin is worked off the body, and one wing and one leg are left attached to the trunk. In skin-skeletal preparations it is possible to disarticulate the limbs, which facilitates their separation from the trunk without compromising the integrity of either the skin or skeleton. This is not possible for skin-fluid preparations. For this reason, we recommend an initial side incision. Skin and feathers should not be removed from the wing and leg that are attached to the trunk.

Inevitably there is some damage of muscle around the tail when the rectrices are detached. The skull can be removed entirely, or various amounts of the anterior section can be left, if keeping the bill with the skin is deemed important. The latter involves minor soft tissue loss.

Once the skin has been removed, the body is fixed and preserved as for any fluid specimen. This provides a representation of most of the muscles in the body. Care with skinning will minimize myological loss, but some damage to dermal muscles (and those around the tail and possibly the head) cannot be avoided. The method we describe here can also be used with flat skins or pelts. If a skeleton is desired, the bones can be removed from the preserved body as they would from any fluid specimen.

Fluid specimens obtained in this way are not as satisfactory as those prepared with entire bodies, but in certain circumstances they offer advantages. We have found the technique useful with rare taxa, when both skins and fluid specimens are at a premium (Fig. 1). It has been used with specimens needed for fluid preservation, but when the plumage condition also is of particular interest. In taxa where the plumage is important for subsequent confirmation of identification, it can be used, particularly if effects of the preservative compromise salient points.

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Evolution of Short Incubation Periods in the Parasitic Cowbirds, *Molothrus* spp.

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A short incubation period can be advantageous for a brood parasite. By hatching before host young, parasitic nestlings can dominate intrabrood hierarchies and divert parental care away from brood nest mates (Payne 1977). Friedmann (1927) argued that the 10-day incubation period of the Brown-headed Cowbird (*Molothrus ater*) was such an adaptation; however, Nice (1953) later summarized observations on incubation periods of 62 Brown-headed Cowbird eggs in at least 8 host nests and found that none hatched in less than