

among vertebrates, except perhaps among humans. (Possible parallelisms may be: 1, building of false or play nests in male marsh wrens, weaver birds, etc.; 2, the clearing of display courts in manakins, ruffs, lyre birds, etc.; and 3, some aspects of courtship feeding. In insects the bubble ritual of certain of the Empididae seems to embody a similar dependence on external objects for the primary sexual stimulus.) In my opinion, it is this symbolism, which we may call the transferral effect, that has permitted the evolution of the extraordinary structures built by bower-birds. In essence, the bowers are bundles of secondary sexual characters.

Psychologically but no longer physically linked to the bird, such "secondary sexual characters" are open to a much greater variety of expression. Sticks, paint, insects, fungus, seeds, stones, clay balls, charcoal, animal and plant silk, grasses, flowers, fruits, shells, moss, and all manner of shiny, odd, and colorful objects are incorporated in the patterns of bower-bird behavior. The results are the unique and exaggerated bowers (sexual objects) we know in many bower-birds.

A second and taxonomically important effect appears to be closely linked to the transfer of sex stimuli to objects. Following the substitution, important changes may occur in the no longer important morphological stimuli, and one of these seems to be for the male to revert to the appearance of the female. In short, when the conspicuous plumage of the male is no longer needed and hence a detriment, the forces of selection tend to favor protective coloration, and the male will resemble more and more the protectively colored female. Such changes may occur relatively quickly once the threshold of transfer has been passed, and it may be because of this condition that we find the females of certain closely related species (in *Amblyornis* and *Archboldia*) to be nearly indistinguishable from each other; yet the males may be either highly dimorphic or virtually indistinguishable from the females.—E. THOMAS GILLIARD, *American Museum of Natural History, Central Park West at 79th Street, New York 24.*

**Winter Feeding on Sap by Sapsucker.**—The extent to which the Yellow-bellied Sapsucker (*Sphyrapicus varius*) may feed on sap from leafless trees in mid-winter in the northern part of its winter range depends somewhat on weather conditions as indicated by the following observations made in Seneca, Maryland, on January 31, 1954. After a night of freezing temperatures, the official readings (Washington, D. C.) were 29° F. at 11 A.M., 31° F. at noon, 32° F. at 1 P.M., and 34° F. at 2 P.M. At 11:30 A.M. a sapsucker was drilling holes in a 50-foot Black Walnut (*Juglans nigra*) at the edge of a swamp. The holes were in horizontal rows every few feet up the trunk. For the first half-hour the bird drilled new holes on the sunny side of the tree. After noon, less time was spent on drilling as the sapsucker visited holes in many of which sap sparkled in the sun. On withdrawal, the sapsucker's bill gleamed with moisture. A trip from bottom to top of drilled areas took 5 minutes or less, after which the bird would drop through the air or hitch backwards to begin over again. The volume of excreta indicated considerable fluid intake. Thus in 10 minutes the sapsucker voided 4 times and in a 25-minute period 11 times. Voided matter, as it shot down and backward, sparkled like water. After 1 P.M. trickles of sap ran from many holes. Observations were discontinued at 1:30 P.M. Sapsuckers were not found feeding on this tree on 3 successive week-ends of warm weather.

In summer feeding on nesting grounds, as observed in Tamworth, N. H., in July, 1953, a family of 5 sapsuckers fed almost constantly on a Yellow Birch (*Betula lenta*). Horizontal rows of holes close together formed a band around the tree. Below a limb, holes had coalesced through heavier use to form a well  $\frac{3}{4}$  by one inch, denuded

of bark. New holes and enlargements were made above the topmost row. Observations made within 12 feet with binoculars ( $7 \times 50$  Zeiss) showed that sapsuckers fed on sap which ran down from the leafy branch where it joined the main trunk. A bird might cling  $\frac{1}{2}$  hour before a well, alternately resting and feeding. These findings confirm those of Bolles (Auk, 8: 256-270, 1891). In winter, sap stored in the trunk may be more stationary so that a pattern of rows well separated yields the most. Feeding sapsuckers, however, are forced to move about as there is no heavy flow at any one point. Above observations suggest that freezing nights and thawing days favor movement of sap. The volume and watery nature of the sapsucker's excreta may have resulted from an intake limited to sap. In summer feeding, solid food along with sap is afforded by occasional insects.—LAWRENCE KILHAM, 7815 Aberdeen Road, Bethesda, Md.

**Further Notes on Alcoholic Specimens.**—In a recent issue of 'The Auk' (72: 300-303, 1955), I made suggestions for the preparation of alcoholic specimens and skeletons of birds. I have since received several inquiries regarding the shipment of spirit specimens. Collectors on expedition and foreign correspondents usually do not have large quantities of a preservative available. They also are concerned about the expense involved in shipping specimens in large fluid-filled containers. There is, as a matter of fact, a simple, inexpensive way to mail specimens. They do not need to be immersed in fluid while in transit. After the specimen has been in the fixative for three or more days (depending on the size of the specimen and the method of treatment), it may be wrapped in cotton saturated with the fixative, placed in a double-walled polyethylene-type bag, and mailed in a wooden or heavy cardboard box. Two plastic bags, one placed inside the other, serve this purpose admirably. Or, a tubular section of plastic material can easily be transformed into a double-walled sack by tying a cord around the tube at its midpoint and then doubling one half over the other. When the open ends are tied securely, the fumes from the saturated cotton will maintain the specimen in excellent condition for several months. I have received well-preserved specimens from Africa prepared in this manner. It is important that the bags be sealed to prevent seepage and excessive evaporation of the fixative. In order to prevent punctures of the plastic, sharp beaks and claws should be wrapped with cotton or cloth.

My previous note dealt with the preparation of spirit specimens for gross dissection. For this purpose, preservation in alcohol or embalming fluid is desirable because these fluids are more pleasant to work with than is formalin. Certain constituents of some embalming fluid formulae, however, may interfere seriously with microtechnic staining methods. If one intends to do any microscopic work, therefore, it is best to use another fixing agent. Experience indicates that one of the best fixatives for this sort of work is buffered 10 per cent formalin. For the convenience of ornithologists, I quote here the formula as given by Lillie (1954. *Histopathologic technic and practical histochemistry*. Blakiston Co., p. 34). "Neutral buffered formaldehyde solution (pH 7.0). 37-40 per cent formaldehyde solution, 100 cc.; water, 900 cc.; acid sodium phosphate, monohydrate, 4 grams; anhydrous disodium phosphate, 6.5 grams." After material has been removed for microscopic study, the specimen may be washed in running water to remove excess formalin in order to reduce skin irritation when handling in gross dissection.

Gale and Geary (Anat. Rec., 124: 95-99, 1956) recently presented an embalming fluid formula, which they found gave satisfactory preservation for histologic diagnosis in all tissues, although there was autolysis of the mucosa of the gastro-intestinal tract.—ANDREW J. BERGER, *Department of Anatomy, University of Michigan Medical School, Ann Arbor, Michigan.*