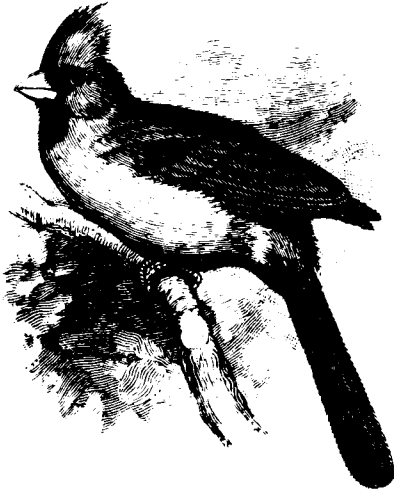


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Bird Sexing A New Approach

One of the most frustrating problems with which an aviculturist must contend is the difficulty in sexing those birds which show no sexual dimorphism. Although distinct differences between male and female may be obvious in many species, there are those groups in which sexual differences are obvious only during the breeding season. When it comes to managing a captive group of birds, whether it be a large or small collection, where one of the major objectives is breeding, it is of the utmost importance to be able to determine males and females. This, by necessity, must be the starting point.

In many cases, one does not wish to wait until the breeding season commences to sort out potential pairs. In addition, if one is acquiring birds from other sources one would like to be reasonably sure that the appropriate sex is obtained. Too often what we consider to be true pairs turn out not to be pairs at all.

There are several common methods by which aviculturists determine the sex of their breeding stock. One of the most reliable, of course, is simple examination of external characteristics which are typical male or female. In many species there are distinct plumage differences, or adornments in the form of combs, wattles, eye colorations and so forth which will indicate the sex. There may be obvious skeletal differences which can be used and measurements taken for comparison with data already available in literature. The narrow or wide separation of pelvic bones on either side of the cloaca is used by some breeders as a means of identifying males and females respectively. In many cases, however, a value judgment must be made with regard to the spatial separation and is thus not totally reliable.

Behavior can be another indicator of sex. It may be highly reliable during the breeding season for monomorphic series when male postures, display patterns, and calls are particularly intense. Females, by the appropriate responses to male displays indicate their sex. But during the nonbreeding season, behavior of both sexes may be so similar as to provide no clues. Thus, if one is trying to pick out potential breeding pairs from a group of

by Arthur C. Risser, Jr., Ph.D. • Curator of Birds • San Diego Zoo

birds during the nonbreeding season, a certain degree of uncertainty is bound to arise in the selection.

The surest way to identify sex is to determine whether the bird possesses testes or ovaries. A laparotomy is an operation in which the abdominal cavity is opened and the reproductive organs examined. As with any surgery, there is a certain amount of trauma involved, but the technique is being used more widely than it has in years past with considerable success. Not only can one determine the presence of testes or ovaries but in many cases it is possible to get a general picture of the reproductive status of the organs as being either quiescent or active. Even though there is some risk involved in performing laparotomies, an aviculturist who is intent on breeding expensive birds may be more than willing to run that risk in order to be assured of establishing true pairs. (See Risser, A.C., 1971, *The Condor*, Volume 73 No. 3, pages 376-379.)

continued on next page



Dusky Lory, a sexually monomorphic species whose sex can be determined by assessing gonadal activity.



Laboratory assistant collects fecal sample from individually caged birds.



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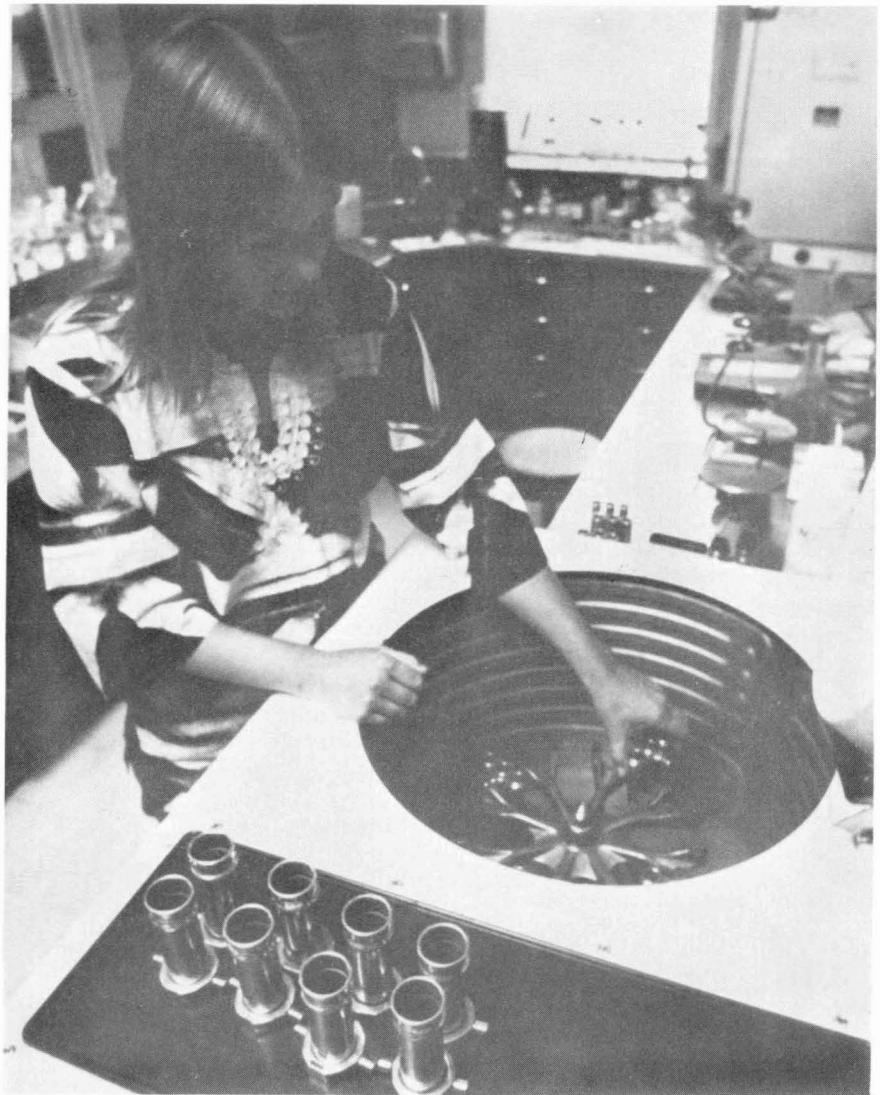
joined A.F.A. in the last two months. A.F.A. appreciates their support and welcomes them to the federation. The address appears on page 3 for members wishing to contact them.

Bird sex can also be determined by microscopic examination of the chromosomes — tiny threadlike structures in all animal cells which transmit heredity and sex characteristics. One method requires plucking an emerging feather, extracting the pulp, treating it with a series of chemical solutions and then straining the contents which distinctively marks the sex chromosomes. A similar procedure requires that blood cells drawn from the specimen be cultured on special medium and then examined under a microscope. This method is being used widely by several zoos including Houston and San Diego. Cytogenetics — that branch of science which deals with heredity and variation — can also shed some light on possible hybrids or abnormalities which could arise from potential pairings.

The newest technique being used to a large extent at the San Diego Zoo is the analysis of a fecal sample to assess the gonadal status of healthy birds as an index to their sex. As blood passes through the excretory organs, small quantities of steroids are removed and elimi-

nated as part of the excretory products. Utilizing radioimmunoassay techniques it is possible to analyze levels of estrogen and testosterone in a fecal sample. What is seen is a correlation of sex to the relative activity of the gonads. Thus, an individual with a high estrogen to testosterone ratio would be most likely a female. Where there is no clear-cut determination by this method, even after repeated sampling, one must then rely on one of the more laborious and sometimes stressful methods described above. It is hoped that ultimately the technique can be refined to the point that breeding season, reproductive maturation and even reproductive failures can be described.

This method does have the distinct advantage of not putting the bird through any trauma. It is a procedure, however, that does involve some time and expense. Necessary equipment includes a centrifuge, a total Beta counter, tubes, vials and various reagents. It also requires a trained technician licensed to handle radioactive materials. At the present, the ability to sex birds by means of fecal examination



Extracts from fecal sample are processed through a centrifuge.

is still in its infancy and is not readily available to other zoos and aviculturists. But because of the relative simplicity of steroid level determination, we are considering the establishment of a laboratory which could not only provide gonadal assessment as a service to others with sexing problems but also allow us to engage in endocrine research which would hopefully be beneficial to all aviculturists in the long run. It might, for example, be possible through hormone therapy, to induce multiple ovulations in those captive birds whose population levels in the wild are critically endangered.

There is, at this time, no way of telling what it will cost to run an individual sample or how all the logistic problems which are bound to arise will be handled. It would be nice to know, however, whether there is enough interest in this particular sexing technique to support such a service. And eventually, funds would have to be found to equip and staff such a facility.

We would much appreciate some indication from our readers as to whether there is enough interest to warrant development of such a laboratory. Please send comments to Dr. Arthur C. Risser, P.O. Box 551, San Diego, Calif. 92112. ■

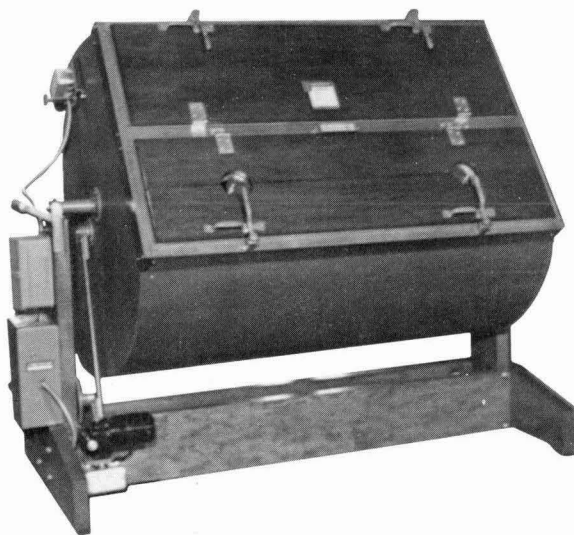


Laboratory technician prepares column apparatus for separation of steroids from fecal sample.

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