ASA Avicultural Bulletin

A JOURNAL FOR BIRD BREEDING, CONSERVATION, RESTORATION AND EDUCATION
NOVEMBER/DECEMBER 2015

NEXT ISSUE

Flamingos!

The purposes of the Society are the study of foreign and native birds to promote their conservation and protection; the dissemination of information on the care, breeding, and feeding of birds in captivity; the education of Society members and the public through publications, meetings, and available media; and the promotion and support of programs and institutions devoted to conservation.
Front Cover: Lady Ross Turaco (Musophaga rossae) Photo: Carol Stanley
Inside Cover: Chilean flamingo (Phoenicopterus chilensis) Photo: Carol Stanley
Feather Paragraph artwork by Susie Christian

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Contents

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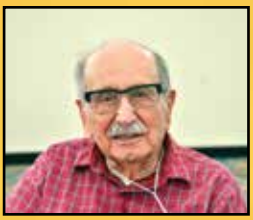

President's Message

Last Call - A Remembrance and Farewell

I must admit that I have enjoyed living through the Golden Age of Aviculture. I officially became a member of ASA in July or August of 1945, while I was still in the Army. With the end of World War II, America enjoyed 50 years of economic prosperity. Through ASA, I was privileged to see great aviaries and great birds in private collections. Monthly meetings at member's homes was a popular feature.

Harold Rudkin's aviaries in Fillmore, CA, was an annual highlight. Ninety aviaries, the first Blue-mask lovebird, the Kea and the Ocellated turkey were memorable sights. Rudkin owned an orange grove and members were treated to the best orange juice you would ever taste.

And Lynn Hall and his great collection and Jerry Jennings, then breeding Parrot finches. And not to forget Jean Delacour, at the time, the Director of the Los Angeles County Museum of Natural History, whose home was in the Wilshire district of Los Angeles. Delacour had a stream running through his back yard and the stream, about 10 feet below ground level, was covered with wire and inhabited by flamingos and turacos.

Delacour did not drive so he turned his garage into a partial shelter, connected to a long narrow aviary along side the garage wall, where numerous finches could be observed.
Remember, in those days there was no limit on bird importation.

Last but not least, I don't remember the name but I believe in Montecito, I saw the unbelievable sight of three Scarlet Macaws flying at liberty. Incredible!

I have had the privilege of twice being president of ASA. This is my last year as president and I will no longer be an officer of ASA. I want to thank all the officers and members alike, who have helped with the conduct of the Society's official and unofficial business. They have all served willingly, without pay, to make ASA the premier avicultural society in America.

My thanks also to the founders ASA back in 1927, in New York, whose foresight has given so much pleasure to so many and have helped many birds become established in private aviculture.

Finally, my great thanks for the friendship of the friends I have made through my Society membership.

Arrivederci!

Ivo Lazzeroni
President, Avicultural Society of America

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ASA Regular Meetings are generally held the first Sunday of the Month in Southern California. Everyone is welcome to attend. Check the website for updates on speakers and their topics as well as to reconfirm dates and times etc. Come as you are and bring a friend!

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Comparative Anatomy of the Musophagidae

Georgann B. Johnson
Sacramento, California

LIVINGSTONE'S TURACO (TAURACO LIVINGSTONII) PHOTO STEVE DUNCAN

INTRODUCTION

The 20 species which comprise the avian order Musophagidae* (commonly called turacos) have a number of physical and anatomical characteristics that set them apart from many other birds. While uniformity among the 20 species is not complete, certain generalizations can be made. One of these is that the sexes are visually indistinguishable in all of the species save C. leucogaster, in which the males have a black beak and the females a green beak. Unfortunately, most of the literature regarding the anatomy of these birds was developed more than 40 years ago, leaving many questions unanswered and many generalizations suspect in light of new information about these species' ecology including behavior and diet.

FEATHERS

Probably the most distinguishing feature of these birds are two unique pigments deposited in their feather keratin. One, turacoverdin, is a green pigment found in the rami in all species of Tauraco and Musophaga, and in Corytheola cristata. The other, turacin, provides the red colored feathers in species of the first two genera.

•currently, authorities believe that turacos should be afforded separate status as their own order (Musophagaformes) instead of being categorized as a family under the order Cuculiformes. Regardless, there are six genera of turacos - Corythaeola (1), Crinifer (2), Corythaixoides (2), Criniferoides (l), Musophaga (4), and Tauraco (10).

GREAT BLUE TURACO (CORYTHAEOLA CRISTATA)
PHOTO CAROL STANLEY

Both pigments contain copper and spectral data demonstrates that the former is likely an oxidized version of the latter. (Dyck, 1992) In fact, the two pigments are intermingled within individual feathers in the breast patches and crests of some species and turacoverdin occurs only in the presence of turacin. Other species outside the Musophagidae order have turacoverdin pigment, including Ithaginis (pheasant) and Rollolus (partridge), both members of the Galliformes. An additional interesting note is that both pigments are soluble in a weak base - which may have led to the myth that wild birds lose feather color when exposed to rain.

Another uncommon feature of these birds is that the feathers of the head and breast of most species are deficient in barbules so that they seem hairy or have a "down-like texture." (Moreau, 1938; Moreau, 1958) These feathers make up the characteristic erectile "crests" found on all but three of the species. In addition, the contour feathers have an aftershaft. (Sibley & Ahlquist, 1990)

The wing to tail ratios are uniform across the species, with the wing length at four-fifths of the tail length. The wings are rounded with the secondaries usually a bit shorter than the primaries. Also, some of the primaries are slotted, probably related to the short, slow flight patterns used by these birds. (Moreau, 1958) None of the species have eyelashes but all of them do have a tufted, bilobed uropygial (preen or oil) gland. (Lowe, 1943)

FEET

These birds are defined as having semi-zygodactyl feet with the fourth toe being reversible and not permanently directed backwards. A typical resting position will find the outer toe at approximate right angles to the main axis of the foot, but it can be moved further back or directed forward, depending upon the bird's perching needs. Additionally, the claws are short and abruptly curved. (Moreau, 1938) Some researchers have reported that nestlings have a short (-1mm) wing-claw but this seems to vary from species to species and even among individuals within a species, and because of this it cannot be said with certainty that it is a defining anatomical feature. (Moreau, 1958; Fry, et al., 1988)

BEAK&HEAD

All turacos have a short strong beak with a curved culmen. In some species the culmen is ridged (T. bannermani, leucolophus, and macrorhynchus) and in others curves back into a frontal plate (M. rossae and violacea). The nostrils are located on the beak but vary in shape and position. Some species have slit shaped nares while others have circles; in many species the nostrils are covered with feathers. (Moreau, 1958)

Internally, a single unifying factor is that all species lack a vomer. (Sibley & Ahlquist, 1990) Additionally, the palatine processes arise from the more proximal end of the maxillary bone and the distal ends of the uncinate bone end in a sharp curve where they meet the outer rim of the palatine. (Lowe, 1943) Moreover,

LIVINGSTONE'S TURACO (TAURACO LIVINGSTONII)
PHOTO STEVE DUNCAN

GUINEA TURACO (TAURACO PERSA) PHOTO GEORGANN B. JOHNSON

VIOLACEOUS TURACO (MUSOPHAGA VIOLACEA) PHOTO STEVE DUNCAN

the quadrate bone in turacos is pneumatized, one of the facts that earlier taxonomists relied upon to distinguish these birds from cuckoos that have a solid quadrate. Finally, the tongue is short and thick and of a triangular shape, consistent with the tongue shape found in other frugivorous birds.

DIGESTIVE SYSTEM

Turacos have no crop but do have an exceptionally large and well developed proventriculus, with walls twice as thick as those of the gizzard. The gizzard, in tum, has only a thin muscular structure with no horny cuticle or koilin lining its interior. Additionally, turacos lack a caeca. These anatomical features are consistent with the fact that turacos are primarily frugivores, though they have been known to eat insects and snails, particularly when they are feeding young in the nest. (Fry, et al., 1988) The major exception to this diet is seen in the Great Blue Turaco (C. cristata) which ingests a significant number of leaves, algae, and rootless floating plants as part of its diet. (Sun, et al., 1997)

Since so little has been published regarding the digestive systems of the turacos it is difficult to make accurate generalizations regarding this portion of their anatomy. Two studies regarding intestinal parasites have been undertaken, primarily for the purpose of determining the phylogenetic relationship of these birds to other species, but these studies do not describe the anatomy in any detail. (Clay, 1947; Bennett, 1993)

PURPLE-CRESTED TURACO (TAURACO PORPHYREOLOPHUS) PHOTO CAROL STANLEY

As an aside, with the recent confirmation by Sun and his associates that a significant portion of the diet of C. cristata is leaves and related plant matter, it would be interesting to pursue the comparative anatomy of the digestive system of the turacos generally and the Great Blue in particular. As stated below, recent research points to a possible evolutionary relationship between turacos and the hoatzin. The hoatzin is noted for being an herbivore that has a crop, which acts as a glandular muscular stomach used to grind up tough leaves. Thus, a re-examination of the digestive anatomy of the Great Blue might be in order, to see if its foregut differs from other turacos in conformity with its variant diet. Likewise, the dietary research raises the additional question of whether the Great Blue actually lacks a caeca- since that organ is often involved in the fermentation digestion of plant material.

SKELETON

The lack of a furcula* is probably the most significant skeletal feature of these birds. (Sibley & Ahlquist, 1990) This is consistent with the fact that they are "strictly arboreal, but poor fliers, moving from canopy to canopy with bursts of flapping and unstable-looking gliding." (Fry, et al., 1988) With slight variation, all species have 15 cervical vertebrae, 19 presacral vertebrae and 5 dorsal vertebrae.

*Wishbone or 'merrythought' The Cambridge Encyclopedia of Ornithology. - Ed.

With respect to the skull, characteristics of note include relatively huge lacrymals that connect with the frontal bones and a large horizontal and backwardly projecting process of bone that is deeply grooved for the passage of the nasal ducts. (Lowe, 1943) Turacos are classified as desmognathous birds as stated above, there is not a complete "shelf" between the nasal and oral cavities.

It is interesting to note that studies of the fossil record demonstrates certain similarities between the "basal land bird assemblage" and turacos, tinnamous, galliformes, cuckoos and hoatzins. (Olson, 1985; Houde, 1988) This conclusion is based, primarily, on the well-defined terminal iliac process of the modem birds resembling the lithomithid pelvis. An observation based on ecology alone seems to have been proved correct: all of these birds inhabit an area surrounding the "equatorial rain belt" which has been "remarkably stable in shape and extension from early Tertiary times - that is, for as long as Musophagida are likely to have been a distinct family." (Moreau, 1958)

MUSCLES

The muscles of the wings and breast are "relative to most other birds, feebly developed, and are long, thin and narrow slips" (Lowe, 1943) The pelvic muscles include the caudofemoralis, iliofemoralis, semi-tendinosus, accessory semi-tendinosus, iliofemoralis extemus, iliacus plantaris and the popliteus. (Sibley & Ahlquist, 1990; Lowe, 1943) Turacos have very well developed M. fibularis longus, which end in strong, rounded, cord-like tendons

above the tibiotarsal joint. (Lowe, 1943) It is likely that the exaggerated development of this muscle is in keeping with the mode of locomotion utilized by these birds - short hops from branch to branch.

DNA & PHYLOGENY

Initially, taxonomists classified turacos with cuckoos as two families in the order Cuculiforrnes, based primarily on external appearance. Beginning in the early part of the 20th century, however, detailed examinations of the skeletal structure, feather tracts and digestive systems of both types of birds led to the conclusion that they were not as closely related as had been believed. (Lowe, 1943) Even as recently as twenty years ago, some researchers continued to press the association based on an analysis of egg white proteins. (Sibley & Ahlquist, 1972) However, in the mid-1980s, a comparative chromosome banding study was undertaken which revealed a lack of phylogenetic relatedness between turacos and cuckoos, justifying their assignment to a family of their own. (Tuinen & Valentine, 1984) Even more important, however, is the fact that based on this chromosome study, it appears that turacos as a group are more closely related to the gallinaceous birds from an evolutionary standpoint. (Houde, 1988)

CONCLUSION

While a brief flurry of investigation into the anatomy of the Musophagidae was undertaken nearly fifty years ago, nothing significant in the realm of comparative anatomy or physiology has been published since. The broad generalizations regarding certain physical characteristics of the members of this order need to be refined and more accurately delineated, particularly in light of recent discoveries with respect to ecology, diet, and DNA structure. With many of the turaco species listed as endangered or threatened by CITES, new information about their anatomy and physiology, which could contribute to successful captive breeding programs, is critical before the populations are lost entirely.

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45 DAY OLD VIOLACEOUS TURACO (MUSOPHAGA VIOLACEA) PHOTO CAROL STANLEY

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Procedure For Hand Feeding Turaco Chicks From Hatch

Mick Regas
Florida Avian Conservancy

2 DAY OLD VIOLACEOUS TURACO (MUSOPHAGA VIOLACEA) PHOTO CAROL STANLEY

I leave the baby in the hatcher for about 12 hours, move it to a brooder at about 97 degrees Fahrenheit with enough humidity to keep the baby hydrated.

Weigh the chick and give first feed, just a few drops of pedialyte given with a 1cc syringe. (Expect first weight to be 16 to 24 grams depending on species) I find that it is best to only load the syringe with the amount of feed to be administered, to prevent an over-push of the syringe.

Food is always fed between 95 and 100 degrees Fahrenheit.

Then, a two hour schedule begins. I begin at 7:00 am and end at 11:00 pm. Should be OK to end at 9:00 just monitor growth.

I use a 10% rule….. if the baby weighs 40 grams, it would get 4cc of food at each feeding. I always go light for the first several feedings. These chicks have no crop but you can watch the food travel down the throat and disappear between the shoulder blades.

The baby should readily ask for the food with open mouth and little grunts. It should go in very easy. Do Not Force. The baby will settle right into the process after just a few times. Make every effort that the people feeding are all doing it the same way.

Pay close attention to the smell of the poop. It should have virtually no smell at all. If the poop begins to smell then get the baby on prophylactic medications for a few days. I use a product referred to as BDF it stands for Baytril, Diflucan, and Fluconazole. I use a compound pharmacy and can provide more info upon request.

Also, I have discovered that if you pay attention to the inside of the mouth of the baby has turned bright red and looks inflamed, using a Q-tip swab the baby's mouth and throat with nystatin liquid. It usually only takes about 4 applications twice per day and the mouth is back to normal.

6 DAY OLD VIOLACEOUS TURACO (MUSOPHAGA VIOLACEA) PHOTO CAROL STANLEY

TURACO HAND FEEDING FORMULA

Always between 95 and 100 Deg F and no more than .2cc at a time, until they weigh over 30g, then you can increase to .3 cc at a time.

- ¼ tsp Exact baby bird formula
- ½ tsp baby food (I use apples or apples with blueberries only 2nd year)
- ½ tsp Purified water (we have well water and to avoid potential problems I always use Purified Water

Days 1 and 2:	use the formula above, but make it a little more liquid for the baby, should be consistency of the baby food
Days 3 thru 6:	use the formula above, but add 4 pieces of crushed Zupreem Low Iron Soft Bill Diet, should be the consistency of the baby food
Days 7 thru 14:	use the formula above, but add 4 pieces of crushed Zupreem Low Iron Soft Bill Diet, and some crushed banana, should

JUVENILE LADY ROSS'S TURACO (MUSOPHAGA ROSSAE) PHOTO GEORGANN B. JOHNSON

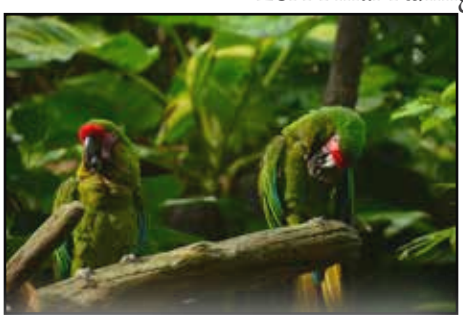
Turaco parents will stimulate the cloaca of the baby in the nest. They take the feces in their mouth and expel it outside the nest to keep the nest clean. We are now the Turaco's parents and it is up to us to stimulate the cloaca to get the baby to poop. I hold the baby with its butt hanging out and stimulate until it poops. Most of the babies poop before they eat, but some prefer after the meal, so just be aware and flexible. The baby should poop at every 2 hour feeding. The nest should remain fairly clean.

Wiping the Violaceos turaco baby's cloaca stimulates the baby to defacate.

Violaceos turaco baby defacates in a neat package for easy removal from the nest or tub.

11 DAY OLD VIOLACEOUS TURACO (MUSOPHAGA VIOLACEA) PHOTO CAROL STANLEY

ESA Final Ruling - Breaking News!



GREAT GREEN MACAW (ARA AMBIGUUS) PHOTO CAROL STANLEY

MILITARY MACAW JUVENILE (ARA MILITARIS) PHOTO CAROL STANLEY

October 2, 2015 Genevieve Wall - A Final Rule from the US Fish and Wildlife Service has been issued. The Military and Great Green Macaws are now listed under the ESA as Endangered. Effective 11/2/15 they cannot be moved across state lines in commerce without a permit. No "special rule" is available for Endangered listed species.

AFA opposed this listing for many reasons, including because it does nothing to help the birds in the wild, and will only serve to decrease genetic diversity of these birds in the US.

This rule will serve to help these birds move toward extinction.

This is another sad day for the birds and for those who love them.

KING EIDER (SOMATERIA SPECTABILIS) PHOTO JOHN DEL RIO

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KING EIDER (SOMATERIA SPECTABILIS) PHOTO JOHN DEL RIO

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Texas A&M Develops New Vaccine To Combat Lethal Disease Affecting Captive Parrots

GREAT GREEN MACAW (ARA AMBIGUUS) PHOTO CAROL STANLEY

COLLEGE STATION, Texas – Researchers at the Texas A&M College of Veterinary Medicine & Biomedical Sciences (CVM) have developed a highly effective vaccine against a lethal virus disease of captive parrots. The disease, called Proventricular Dilatation Disease (PDD), results in blindness, heart failure, or intestinal blockage. It is caused by a virus called Avian Bornavirus. Use of the vaccine against this virus prevented the development of disease in captive birds with no obvious adverse effects.

The investigators—Drs. Ian Tizard, Jianhua Guo, Susan Payne, and Samer Hameed—work at the Schubot Exotic Bird Health Center at the CVM. The research was supported by the Schubot Center and the college. The center is dedicated to conducting research that will improve the health and quality of life of both captive and wild birds. While currently focusing on diseases of parrots, investigators at the center are also studying diseases of water birds, quail, and cranes.

"Proventricular Dilatation disease is an especially nasty infection that kills large numbers of captive birds each year," said Dr. Ian Tizard, the project leader. "Parrot owners are naturally very distressed when their beloved pet dies in such a manner. The new vaccine is expected to stop the development of this disease and prevent much suffering."

The next step in the development of this vaccine will be to seek USDA licensure and then to manufacture the vaccine commercially. This will require extensive field-testing to ensure that the vaccine is safe and that it is effective in many species of pet birds. Thus it will take some time before the vaccine becomes available to parrot owners. Current plans are to market the vaccine through avian veterinarians.

The pace of the additional studies will naturally depend upon the resources available. Current resources are limited, so it is difficult to state when this vaccine will be available to parrot owners.

Rodent-borne Diseases in Aviary Birds

Dr. Jeanne Smith

Fall/winter is the season when I am more likely to see rodent-borne diseases affecting aviary birds. I suppose it is due to other foods becoming scarce and rodents seeking the relative ease of browsing on your bird's food.

The two diseases I associate with rodents in aviary birds are Yersinia pseudotuberculosis and Salmonella spp. Infections. Of the two, Yersinia is much more common. I've probably only seen a handful of cases of salmonellosis in aviary birds whereas I see one or two cases of Yersinia every year. Rodents can also spread diseases as fomites, meaning they can contaminate an area by picking up bacteria or viruses on their feet and tracking it around from flight to flight.

The clinical signs of either Yersinia or salmonellosis would be signs of a bacterial septicemia, especially affecting the liver. Usually in breeder or aviary birds this isn't detected until the bird is very weak or dead. If the bird is identified before it dies it may be very thin, fluffed, depressed, it may have diarrhea and it may have yellow or green urine and urates. Multiple birds may be affected or just one may be due to different feeding habits of that bird. Either disease is diagnosed by culture of a live or dead bird. Necropsy lesions in a dead bird are highly suggestive of either disease. Usually I tentatively diagnose Yersinia versus salmonellosis because of the higher incidence of Yersinia. Once the organism is grown and identified an antibiotic sensitivity should be run. Although Yersinia is usually sensitive to both penicillin and tetracyclines, I have found varying responses and sensitivities between isolates. Salmonellas are most likely going to be sensitive to Baytril, but again I've seen exceptions.

Once a diagnosis has been made and the birds have begun antibiotic treatment the following control measures should be instituted as well.

To control rodent-borne diseases you need to combine the following strategies:

1. Eliminate habitat for rodents.
2. Eliminate things that attract rodents such as spilled food.
3. Eliminate access of rodents to nest boxes, feeders, and waterers.
4. Reduce the rodent population via baits and traps. Don't use baits if you have aviary birds that are likely to eat mice that they find in their flight.

Diseases occur when your birds have access to rodent droppings and urine or things contaminated by rodent droppings and urine. I recommend having wire floors in aviaries, elevated off the ground to allow you to clean up spilled food from under the wire floor. The wire floor will allow spilled food to pass out of reach of the birds. You still

IN ADDITION TO DISEASE, MOUSE INVASIONS CAN BE VERY DESTRUCTIVE AND CARRY AN OFFENSIVE ODOR - PHOTO CAROL STANLEY

need to clean up spilled food under the flights to decrease attraction to rodents. If you have solid floors or planted aviaries, you'll need to do your best to control the rodent population and exclude them from the flight. To exclude rodents, you generally have to use ½ x ½ wire.

Position feeders and waterers so that rodents can't get in them or over them. Have solid roofs/covers over feeder and waterer stations. Mount feeders and waterers where rodents can't get to them, such as hanging away from the wire with a guard on the suspending rope or wire to prevent rodents from climbing down or on a stand with a guard preventing rodents from climbing up.

In cool weather waterers are not much of an attractant for rodents, but in warm dry weather they are. You could go to an automatic waterer system with a small cup or nozzle and eliminate pans of water or mount waterers on the wire to reduce the chances of mice urinating and defecating in the waterer. Clear out weeds and debris around the flights which serve as hiding places and habitat for rodents. Trim tree branches so there is a few feet between the tree and the flight to reduce rat access and habitat. Put out bait and traps to bring the rodent population down.

Store shavings (or other bedding) and feed in tightly covered metal or plastic containers to exclude rodents.

Test Your Avicultural Knowledge

All photos courtesy Steve Duncan

1. I am native to Australia and, for some reason, people like to name me "Miss Piggy." What am I?

2. As a native of several countries in Northern Africa, I am outrageously plumed in bright colors, spots and stripes. All this will distract you from looking into my bright red eyes. What am I?

3. My feathers are irridescent and I am listed as Near Threatened on IUCN 3.

Answers on page 34

2015 Table of Contents Index

Test Your Avicultural Knowledge - answers

All photos by Steve Duncan

1. Cape barren goose
Cereopsis novaehollandiae

2. Vulturine Guinea
Acryllium vulturinum

3. Nicobar Pigeon *Caloenas nicobarica*

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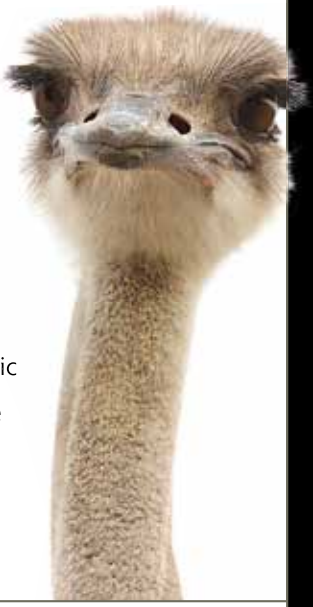

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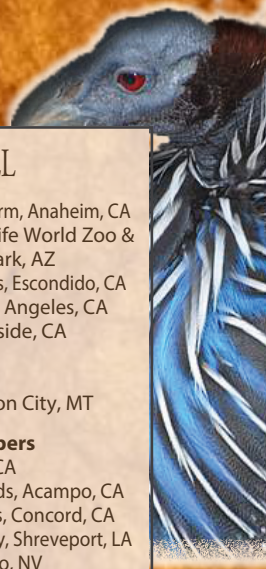

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2016 EVENTS

April 27-30, 2016 **AVICULTURAL SOCIETY OF AMERICA CONFERENCE**, Port Angles, WA. www.asabirds.org/conference/

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October 2, 2016 - Auction at Frank Miser's - www.asabirds.org

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