

Foreword

This delightful book by scientist, artist, and aviculturist, Peter Karsten, is an “owner’s manual” for anyone keeping small insectivorous and frugivorous birds, the so-called softbills, which are delicate species almost never consistently bred in aviaries. Karsten’s handsome, and astonishingly numerous, drawings and paintings, his meticulous instructions, and fascinating case histories provide a tested methodology for both care and propagation. His book breaks new ground in aviculture — beautifully — for both hobbyists and conservationists.

Humans have kept wild birds as pets for thousands of years and Greek aviaries exhibited a wide variety by the fifth century b.c. The Greeks knew talking parrots seventeen years before Aristotle was born. Outside of zoos, however, most “cage birds” have been seedeaters that can be easily fed, such as parrots and finches. Today, poets and plumbers, financiers, and conservationists are keeping scores of delicate softbills, such as pekin robins and silver-eared mesias. Some aviculturists do so to enjoy their beauty and the closeness to nature they bring, others to resolve scientific puzzles, while still others are trying desperately to breed them to save them from extinction.

Of Earth’s 10,000 species of birds, 1,213 are now considered in danger of extinction and the live-bird trade is among their dangers in some countries. Karsten makes it clear that the only way for aviculturists to sustain their collections is through conscientious attention to conservation concerns, as well as to care and collaborative programs of propagation. They must nourish viable populations and generations, not simply pairs of birds.

Peter Karsten was born in Göttingen, West Germany, immigrated to Canada in 1962 and soon began working at the Calgary Zoo. In 1974, he became director, skillfully modernized the zoo with new habitat exhibits, and produced a cascade of technical papers on zoo animal husbandry. Eventually, he was elected president of the Canadian, American and World Zoo and Aquarium Association. Upon retiring from Calgary Zoo in 1994, he devoted himself to wildlife painting, international zoo consulting work, and to breed birds.

No one else has addressed the care and propagation of small insectivorous and frugivorous birds in such rich and loving detail. Karsten’s efforts will help not only those who keep birds to improve their skills but, more especially, the birds themselves. While reading this unusual work, I could not help but think: If only such a book had been available for the Carolina parakeet and the passenger pigeon.



Carolina parakeet



Passenger pigeon

— **WILLIAM CONWAY**
*Senior Conservationist
 and former President,
 Wildlife Conservation
 Society, New York*



Figure 10.0-1 A bird collection in a public aviary.

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Conservation Breeding

Ex situ conservation breeding entails the preservation of true species and subspecies through coordinated breeding of pure genetic lines, with a high degree of genetic diversity over a long period of time. Inbreeding is avoided as much as possible within the managed population to preserve a broad range of genetic expressions, in order to make successful reintroduction of the species *in situ* possible. In essence the animals must retain their fitness to survive and reproduce in the wild, if they were to be returned.¹

We are concerned about dimensions such as: behavior patterns, survival skills, physical and mental fitness, species-specific song, appearance (true phenotype), food and predator recognition, and others including many tangible and intangible aspects. Genetic diversity gives a population a better chance to adapt to changes by having a greater “tool box” of traits to meet a wider range of environmental conditions.

In domestic animals this is not as critical, since environments are extensively manipulated and controlled. To make the point, some of the prized breeds of canaries could not survive if they were to be released to their place of origin. It is not to belittle the achievement of intense line breeding, but it is a different branch than conservation breeding.

The zoo community uses studbooks for many species, which often includes records of the geographic origin in order to recognize subspecies. This is critical for any re-introduction program to the wild. Studbooks are based on diligent record keeping to track genetic lineage, date of hatching, individual identification, geographic origin of founders, ownership, transfers, medical history, and other data.

In any event a breeder should maintain life history records of

1. William Conway et al., pers. com. 1983.

individual birds to track breeding success, health, and behavioral aspects. The collective data of breeding events within a flock offers a valuable foundation to extrapolate trends and patterns to adjust management regimes.

10.1 Pekin Robins in Zoological Gardens

As noted in the preface, zoological gardens maintain important gene pools for endangered species; however, due to limited space and resources many species cannot be propagated in captivity. This presents an opportunity for collaboration between zoos and private breeders, with divided and important roles of exhibiting birds to the public, and off-exhibit breeding. Pekin robins and other softbills do not breed well in typical zoo environments, primarily because they are exhibited in mixed collections, which diminish the opportunity for the birds to establish an undisturbed breeding territory.

The international zoo community and related organizations work closely with the International Species Information System (ISIS). Animal inventory data are periodically submitted species by species and centrally compiled on a computer system.

For the pekin robin: in April 2003, ISIS listed fifty-five zoological gardens holding eighty-six males, seventy-five females and 240 specimens of undetermined sex (401 total). Eighteen pekin robins were hatched, of which five survived, from January 1 to December 31, 2002.

This demonstrates a low rate of *ex situ* breeding, not because the zoos are not capable, but they are unable to commit space and time to breed them, in light of more urgent species recovery programs. The high number of pekin robins with undetermined sex in some institutions indicates that the establishment of breeding pairs is not a priority.

ISIS reported in November 2004: 103 males, 89 females and 195 of undetermined sex, a total of 387 birds. This population produced eleven surviving offspring for the preceding six months, the core breeding season. The reproduction rate has been 2 to 3 percent. The annual reproduction rate of birds held at my aviaries has been significantly greater in a seven-year span (chapter 6.17). Nearly all specimens were paired for breeding and given their own territory, something a zoo simply cannot commit to.

The inherent weakness of a private breeding program operated by one or two individuals is the uncertainty for continuity over the long term. Partnership with a zoological institution would be wise in the interests of preserving a valuable gene pool of endangered species.

A network of private breeders can dovetail with the exhibition

of softbills by transferring birds that have contributed a high number of genetically identical offspring, and other birds not suited for breeding, to zoological gardens in exchange for birds of under-represented bloodlines.

10.2 International Studbooks

The first official register of a breeding population of animals was set up for thoroughbred horses in England in 1791. The first studbook for wild animals was proposed for the extirpated European bison (wisent) in 1923 and published in 1932.

A studbook establishes parentage and lineage of individuals, which allows for genetic management of future offspring to ensure a high degree of genetic diversity. Demographic aspects, such as geographic origin of the founders to identify subspecies status, balance of founder representation, and necessary numbers of individuals to be managed to maintain a self-sustaining population, are other benefits of studbooks.

International studbooks are established for endangered species to embrace as many specimens as possible on a global scale. The rules and procedures for the establishment and upkeep of international studbooks were first published in the International Zoo Yearbook (London Zoological Society) in 1969, and its editor was appointed international studbook keeper.

The key data includes:

- A unique number assigned to the individual
- Its house name or local record number
- Permanent ID (closed leg bands in birds, tattoo, microchip etc.)
- Sex
- Date hatched/born
- Date of death/loss
- Parentage
- History and geographic origin where possible

The World Association of Zoos and Aquariums (WAZA), the Species Survival Commission (SSC) of the World Conservation Union (IUCN), and national and regional zoo associations oversee the program.

There were over 160 international studbooks established by the year 2000 and more are added annually; beyond this there are also regional studbooks.

The International Species Information System (ISIS) developed computer software for the operation of studbooks, called Single Population Analysis Record Keeping System (SPARKS). A new

program, which will replace SPARKS, called Zoological Information Management System (ZIMS), is currently under development. The American Zoo and Aquarium Association (AZA) was instrumental in creating ISIS and is its primary user.

Studbooks establish the history of a species/subspecies under human care as far back as possible, usually to the first wild-caught specimens. Data is at times verified by DNA analysis (DNA “finger printing”) to confirm the genetic characteristics.

The studbook keeper and species coordinator assist in the relocation of breeding stock and progeny and thus manage endangered species on a regional to worldwide basis.

Studbooks are the foundation for cooperative breeding programs and conservation breeding.

10.3 Studbooks for Pekin Robins

Studbook keepers are sustaining a network to assist in the dispersal and acquisition of birds within the breeding consortium. The author currently maintains a regional Canadian studbook. It was established in 2000 and tracks, at the writing of this book, 187 specimens currently or formerly held in twenty-eight private facilities. Thirty-four birds are deceased birds and twenty in potentially non-breeding situations or condition.

The database assigns a unique studbook number for each bird.

Recorded are:

- Studbook number
- Left and right leg band numbers and color
- Physical, permanent features
- House name
- Sex
- Year of hatching or acquisition
- Year lost
- Reason of loss by code
- Sire and dam
- Previous and current owners
- Comments

Any development of a studbook system, be it by the zoo community or a group of private breeders, is of great value. The establishment of these data banks is urgent and meaningful in the context of species conservation.

10.4 Breeding Loans

Breeding loans are effective ways to combine potential breeding

birds, which are held by different owners and by loaning birds to those who have available space. It is a well-known fact that world wide species survival plans are mostly concerned with spaces for these animals to reproduce in either their natural range (*in situ*) or in *ex situ* environments. Any available breeding space with the potential to reproduce rare animals is a precious conservation resource. Effectively, wildlife spaces are really what has become rare and what is threatened with extinction.

The matter of sharing offspring is generally handled by giving the aviary operation or institution, which is keeping and breeding the birds, half of the successfully raised, weaned offspring. The other half is divided between the owner of the male and female. If the pair has different owners, they each receive one quarter. If the breeder owns one bird he/she gains three quarters of the offspring.¹

The ownership of offspring, if not divisible by four, lines up as follows: first the breeder, then the owner of the hen, followed by the owner of the male. The owner of the hen gets the second or third bird; the owner of the male gets every fourth bird. If the pair is breeding successfully in one season it will likely breed again in the next to even out the sharing arrangements. Breeding loan agreements and sharing of offspring should be made for multiple years.

It is understood that the breeder is making his/her best effort to maintain and breed the birds; hence possible losses are accepted as part of the course.

Shipping costs are generally born by the recipient of the birds.

The breeder bands the offspring with his/her closed leg bands and keeps accurate records of breeding success and bloodlines. The birds are registered in a studbook, where these exist.

Collaborative breeding program opportunities between public institutions and private breeders could be pursued to a greater extent for conservation breeding. Public relations and liability issues with potentially dangerous animals have understandably caused some hesitation in pursuing loan agreements. This should be further examined for softbill bird conservation breeding initiatives in the future.

1. David L. Bender, pers. com. 2004.

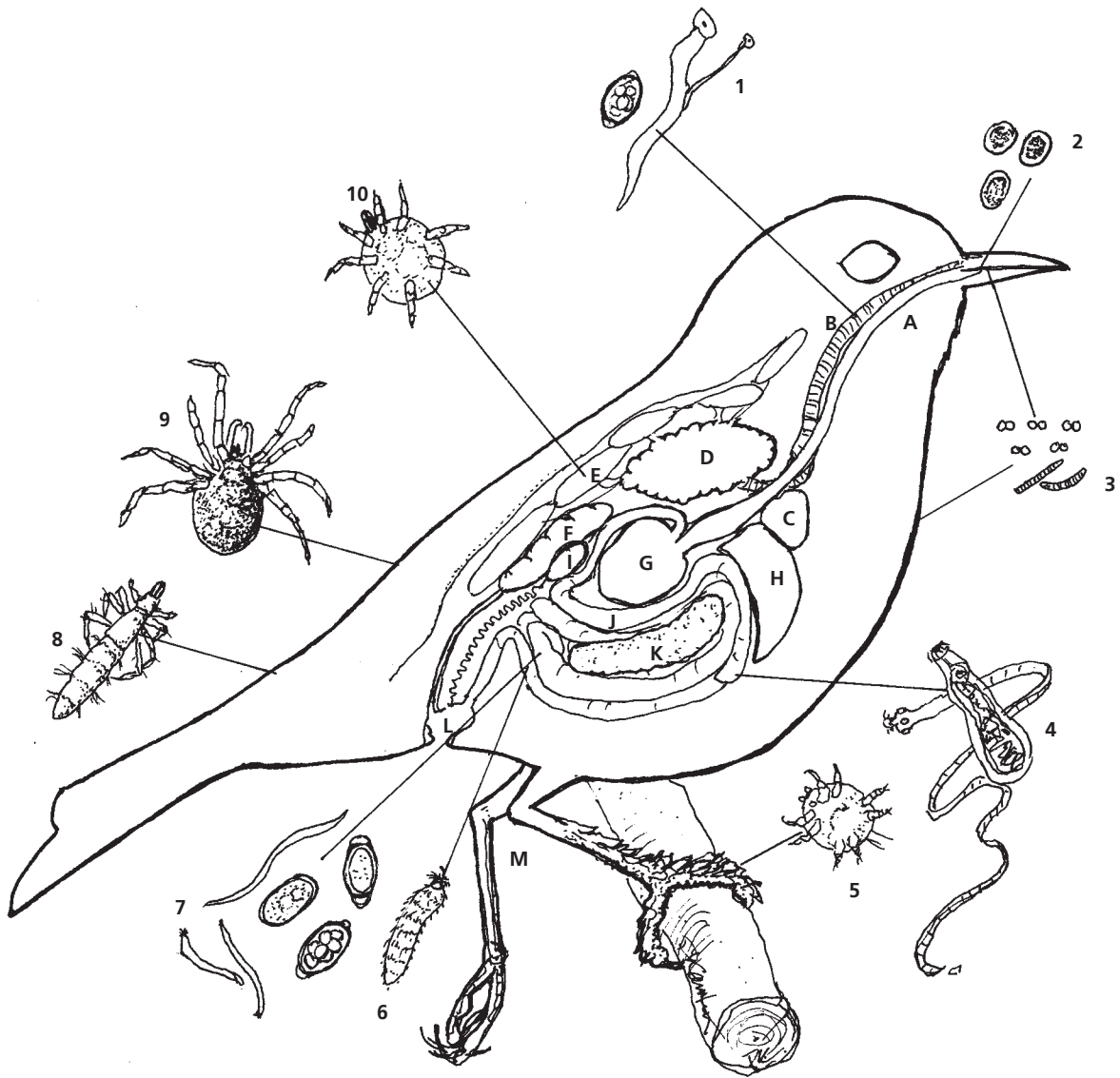


Figure 11.0-1 Sites of pathogen infections and ailments.

Pathogens

1. gapeworm plus egg
2. coccidia (oocysts, entry site)
3. bacteria and fungi (entry sites)
4. fluke and tapeworm
5. scaly leg mite
6. thorny headed worm
7. round worm and eggs
8. biting louse
9. red roost mite
10. air sac mite

Body Parts

- A. esophagus
- B. trachea
- C. heart
- D. lung
- E. air sacs
- F. kidney
- G. stomach
- H. liver
- I. testis
- J. intestine
- K. pancreas
- L. cloaca
- M. leg (left leg injured)

