

# Incubator Disease and Disinfection

by Robert C. Clipsham, D.V.M.  
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As the number of avicultural clients in my practice who are setting eggs for artificial incubation grows, so do the number of eggs per setting. The value of the eggs set also tends to increase, as the aviculturist generally becomes more knowledgeable and breeds more valuable and/or challenging species each new season. The value of the embryos and the quality of the incubators are both sadly underrated as a rule. It is not uncommon for a backyard aviculturist with an average of five or six eggs in a small incubator to have a retail market value of four to ten thousand dollars. Yet it is the rule that these same clients are hesitant to invest the five hundred dollars or more that a reliable incubator will cost. The incidence of annual maintenance is also low.

It is not uncommon for an aviculturist to contact the clinic after several embryos have died during incubation or failed to hatch properly. Histopath and microbiology investigation is helpful at times. Hypervitaminosis D3 and embryonal renal calcification is becoming more common as a diagnosis. Infectious disease is frequently suspect but often difficult to specifically identify due to the organ size, pathophysiology of embryos with poorly documented diseases in psittacines and the frequent incidence of advanced post mortem autopsies when eggs are not candled daily.

Several case histories have included epidemiological die-offs of embryos in the same setting. The causes identified in a majority of cases are management oriented problems due to problems with heat control, humidity levels, egg rotation, egg position, insensitive electronic monitors and faulty mechanics. Enough of these cases have involved infectious disease that it is recommended that all

incubators be disinfected between each setting and thoroughly cleaned. At the present time, I am recommending the use of potassium permanganate and formalin as per poultry industry use. The ingredients are inexpensive and readily available. The fumes produced from a combination of two parts formalin: one part  $KmNo_4$  (vol:wt) are highly toxic. All fumigation procedures should take place outdoors or in well ventilated rooms without human or bird exposure.

A significant number of incubator die-offs have been traced to clients who practice "renting" space to other breeders in their units or buying fertile eggs from other aviculturists to ensure adequate babies are available to fill customers' orders. It is just as dangerous to bring an off-site egg into an incubator as it is to bring a new bird directly into the aviary. Incubators generally have more valuable contents per square inch than any other area of the farm and eggs cannot be held in quarantine. This area of concern needs to be addressed so that clients' efforts are not being undermined at the point of finally realizing a profit, both financially and aviculturally. Many clients will not be aware enough to realize that contagion may be a problem or even know to seek assistance in identifying a differential diagnosis.

From a standpoint of safety and efficiency, any aviculturist hatching any significant number of eggs or any species of value should have a minimum of three incubators, one for incubating, one for hatching (slightly lower temp., slightly higher humidity) and one as a back-up against failure. A generator for power during blackouts has saved several of my clients from suffering a catastrophic loss during a few hours of power failure. ●



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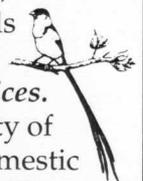
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# If It's Fertile, It Should Hatch!

by Michael Omartian  
Burbank, California

In the past few years, the practice of artificial incubation has increased dramatically. This increase can be directly related to more advanced equipment available, as well as new techniques that are being learned and implemented daily. Combine these factors with increased clutching and more successful hatchings associated with artificial incubation and one's production (success rate) can increase substantially.

The basic tool necessary for artificial incubation is an incubator with automatic turner. There are several incubators suitable for psittacines; however, I have found the simpler the better. I have had the most success with a basic Marsh Farms Turn-X with ten-turn thermostat and automatic turner. It is easy to set and maintains temperature well. When used with a high accuracy thermometer, it is the most reliable parent you could ask for.

My incubators are set at a temperature of 99.4°F dry bulb, with a wet bulb temperature of 84 to 86°F. Other important items to have on hand when artificially incubating are a good quality egg candler, distilled water, corn starch; tweezers, a small hemostat and scissors (all stainless

steel for proper sterilization); cotton swabs and sterile Telfa pads.

Once the eggs are placed in the incubator, candling is possible from the outside of the clear dome. Fertility is clearly visible by the sixth day of incubation. The blood vessels and an embryo with a beating heart can be easily detected. In large psittacines, monitoring of the egg can be limited for the next 20 days or so; however, on the 25th or 26th day the eggs need to be checked for the slanting of the air cell. On the 27th day the air cell should be completely slanted, at which time the egg is placed in a non-turning incubator. Often an internal pip can be detected at this time. Within 24 to 36 hours from this point, an external pip should occur. It is at this point, or transition, that chicks seem to develop problems. Therefore, if external piping does not occur within this time frame, actions need to be taken.

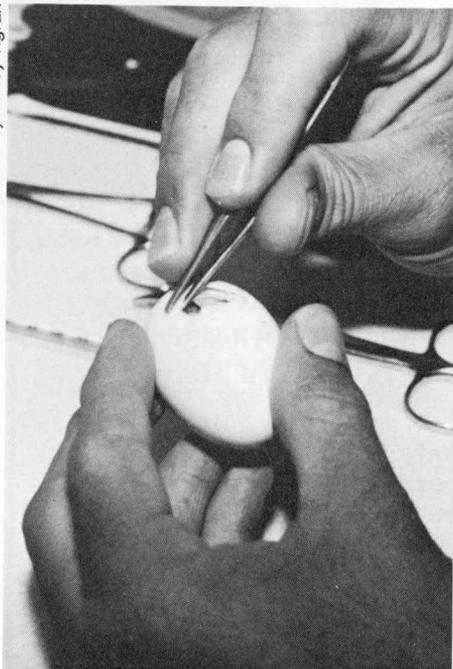
The egg can be opened through the air cell, using tweezers to gently remove pieces of shell, gradually until the top of the egg is removed. The first membrane should be white and paper-like in appearance. By taking a cotton swab dipped in warm distilled water and gently rolling it

across the top of the membrane, the membrane will become transparent. At this point, blood vessels can be detected if present. These blood vessels are an excellent indicator of the closeness to hatching. If they are present, the process of assisting should be postponed until the vessels are pale and have lost their blood supply (anywhere from 20 minutes to 24 hours, depending upon the number of vessels and the activity). If blood vessels are present, you should only get the chick's nose uncovered.

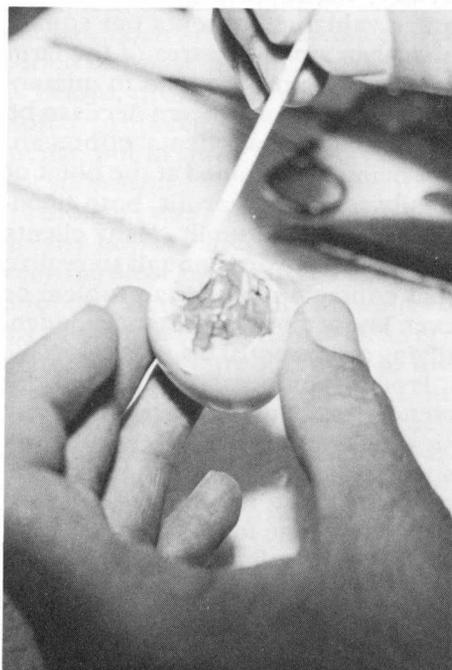
Once the vessels are pale and have lost their blood supply (noticeable by remoistening the membrane with a fresh swab) the membrane can be gently folded or rolled back over the side of the egg. There should be minimal or no bleeding during this process. If bleeding occurs, use corn starch to stop the bleeding, *wait*, and continue the process later. When the membrane has been folded back, without bleeding, the chick's head can be lifted out for a closer look.

If the egg yolk is completely absorbed the chick is ready to come out; if any yolk at all remains the chick must not be assisted out yet! The egg yolk is a yellow substance found at the center of the belly in

Photos by Nancy Vigran



The eggshell can be carefully chipped away with a sterile tweezers, at the air space end of the egg.



When the membrane is moistened with warm, distilled water, you can see whether blood is still flowing through the veins.



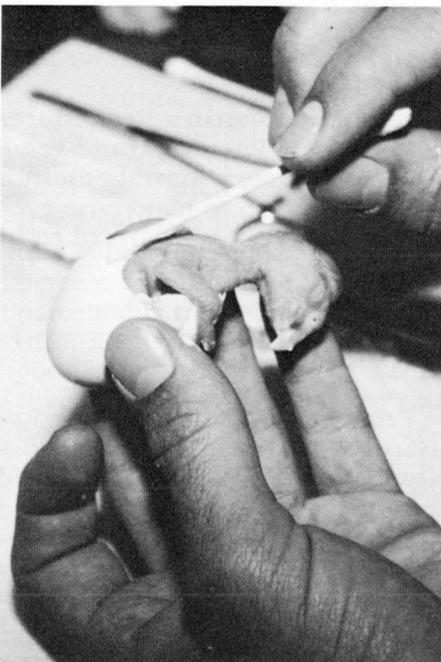
If the egg yolk is not fully absorbed, the chick should remain in the egg.



*Military Macaw and Umbrella Cockatoo chicks, each successfully helped out of their eggs.*

between the legs as you look at a chick while still in the shell. Fold the membrane partially back over the chick, with the nose still exposed and place back in the incubator until the yolk is totally absorbed. The membrane will dry out and thus prevent the chick from pushing its way out too soon. Once the yolk is totally absorbed the chick can be assisted out or allowed to work its way out on its own.

If the umbilicus does not break away, you may need to cut it. This can be done by using the sterile hemostat and clamping off the cord, then using the sterile scissors on the egg side of the clamp (*not the chick side, because this may cause bleeding to occur*) snip the cord. The



*The membrane should be moistened with warm, distilled water using a fresh, clean Q-tip.*

chick should then be placed on a sterile Telfa pad and kept on clean pads for approximately 48 hours until the umbilicus is totally closed. The first feeding of the chick should be held off until he has excreted once.

Following these techniques, numerous chicks have been saved which probably would have died in the shell had they been left unattended. ●

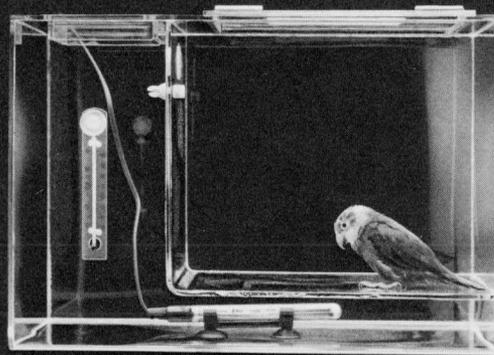
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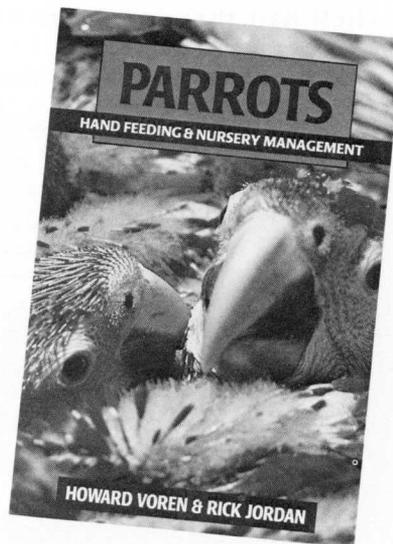
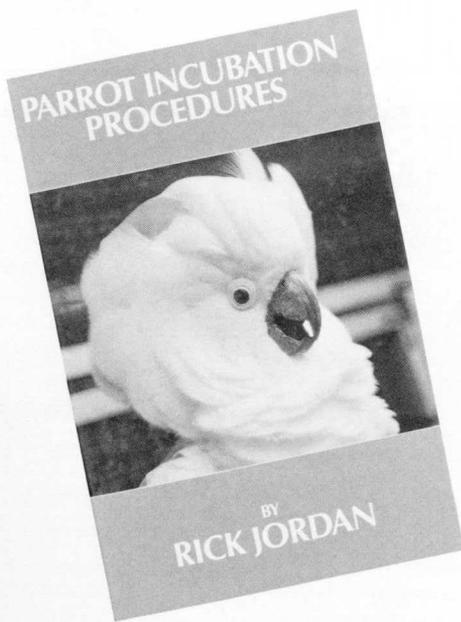
# EX LIBRIS



by Sheldon Dingle  
Los Angeles, California

This issue of *Watchbird* focuses on the incubation of exotic birds' eggs and the hand rearing of the babies if you incubated correctly. We all need help if we are to engage in these productive but complicated skills. Indeed, even some avian parents have a tough time figuring out how to get incubation and feeding right. The birds learn by trial and error but

there are some shortcuts for dedicated aviculturists. By studying a few good books on the subject, a great deal of the trial and error can be avoided. There are no one hundred percent sure things – nothing can guarantee every egg – but the following books can be an immeasurable help as you prepare to incubate the eggs and hand feed the babies.



## I.

**Parrot Incubation Procedures** by Rick Jordan and **Parrots, Hand Feeding and Nursery Management** by Howard Voren and Rick Jordan are two books that should always go together. They are published by and available from Silvio Mattacchione and Co., 1793 Rosebank Rd. N., Pickering, Ontario, Canada, L1V 1P5. Telephone (800) 779-4163.

This pair of books is far and away my first choice for books on this subject. They tell in great detail all the

things you need to know about incubating and hand feeding parrots. Because I personally have an extensive background incubating eggs and feeding baby parrots, I can testify that these authors *know* what they're talking about. For a detailed review of *Parrot Incubation Procedures*, please refer to the Oct/Nov 1990 issue of the *Watchbird*. Please don't start the '93 season without reading Jordan's book. It contains the most accurate and useable body of data ever assembled on incubating parrot eggs.

But what must you do when the eggs actually hatch? If you wait until that point before you make preparations, you and especially the baby bird could be in deep trouble. The thing to do is to get the second book of this pair, *Parrots, Hand Feeding and Nursery Management* (hereinafter called **Parrots**). *Now*, before your problems begin!

**Parrots** covers in great detail the full range of hand raising subjects from managing the nursery to weaning the bird. You'll learn how to set up a nursery specifically to fit your particular circumstances. You'll learn about temperature, humidity, bedding, sanitation, formulas and recipes, instruments and techniques for hand feeding, and weight monitoring.

The longest and, to my mind, the most important chapter is "Potential Health Problems in the Nursery." Believe me, gentle reader, it is a toss up between horses and birds as to which critter is the most stupid. I've raised lots of both and nearly all of them were programmed to self destruct. This chapter gives you a fighting chance to head off the thousands of situations that are designed to destroy your baby bird. Forewarned is forearmed. To have just this *chapter* in your nursery (let alone the whole book) will improve your birds' chances and possibly help you avoid a total nervous breakdown.

I especially like the last chapter, "Weaning." I can't believe how much I learned from it. It caused me to abandon my old formula of "Eat or die, you little S.O.B.," and we're all happier now.

**Parrot Incubation Procedures** costs \$35 and **Parrots, Hand Feeding and Nursery Management** is \$45. If you plan to hand raise even one parrot, you can't afford to be without these two books.

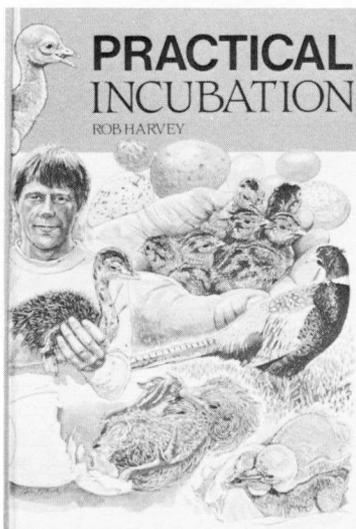
## II.

**Practical Incubation**, by Rob Harvey, is available in England at Owl's Nest Bookshop, Birdworld, Farnham, Surrey GU10 4LD and in the U.S. and Canada from Silvio Mattacchione and Co., 1793 Rosebank Road N., Pickering, Ontario, Canada, L1V 1P5. The price is \$40 U.S.

This book, from an English aviculturist, is an easy to read text designed for the beginner. It is based on

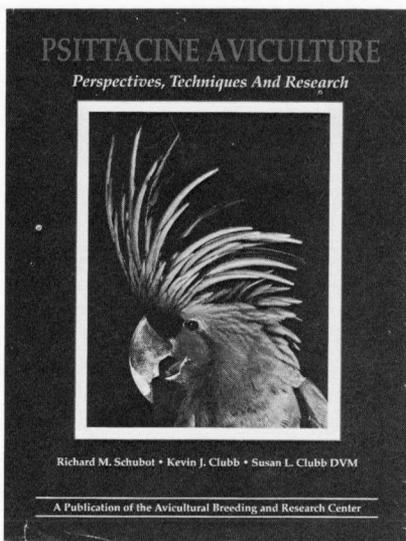
Harvey's own extensive experience incubating exotic eggs of all sorts. Indeed, he notes the incubation periods for several hundred species ranging from albatross to yellowleg including such oddities as Tawny Frogmouth, Atlantic Puffin and the Northern Three-toed Woodpecker.

The bulk of the work is on good, solid advice on all aspects of incubation beginning with how to decide whether or not certain eggs *should* be artificially incubated. For example, don't incubate Bleeding Heart Dove eggs because the chicks are nearly impossible to hand feed. Instead, Harvey pulls the viable eggs for incubation but replaces them with dummy eggs. When the chicks hatch in the incubator, he pulls the dummy eggs and gives the babies to the parents who feed well but don't incubate well. Good trick.



Incubators, thermometers, scales and even the ideal incubation center occupy much of the book. Harvey goes into much helpful detail on these subjects but still reminds us that successful incubation is ninety percent due to human effort and ten percent due to equipment. With this in mind, Harvey presents a lot of good, easy to understand advice and tips aimed at improving your performance.

If you are considering incubation for the first time, **Practical Incubation** is a good book to read. This is especially true if you have a general collection and may have occasion to incubate eggs of pheasants, ducks, quail, ostrich, passerines or parrots. The abundance of good advice is well illustrated with tables, charts and photographs. This is an excellent volume to have on hand.



### III.

#### **Psittacine Aviculture, Perspectives, Techniques and Research**

by Richard Schubot, Kevin Clubb and Susan Clubb, D.V.M. was published in 1992 by Schubot's Avicultural Breeding and Research Center. This is not your ordinary book. It is not a monograph. It is more a collection of papers and essays touching on a number of aspects of caring for and raising parrots. Not all of the subjects will be pertinent to the average aviculturist but in their own words the authors state that the book was written to serve as a reference for the advanced aviculturist, veterinarian or biologist.

Keeping to our subject, I'll focus on the sections of the book that deal with incubation and hand feeding. Perhaps I'll have a chance to do a more extensive review at a later date as the volume contains many very interesting subjects.

The "Common Sense Incubation" section gives good, simplified information on how incubation is handled at the Avicultural Breeding and Research Center. At the ABRC, they have the blessings of being well funded, well staffed, and well motivated. These researchers are not beholden to other groups or limited by circumstances so they are able to freely follow where their experience and research leads.

One of their techniques that seems to be very helpful is that of letting the parent birds incubate their own eggs for about two weeks. In these early and crucial stages of a fertile egg, the parents do a better job. In their experience, the ABRC workers found the hatch rate was significantly higher for these eggs as opposed to eggs pulled at day one. Indeed, in a study

of 88 dead-in-shell eggs, 46 of them were eggs pulled from poor sitters the first day.

There is also some very good, and well illustrated, discussion on how eggs develop — what to look for when you candle an egg. And connected to this are several charts showing the incubation period, range and standard deviation for 31 selected species of the larger parrots. At ABRC, they tend not to handle and weigh their eggs each day as many other places do. They feel that daily weighing is likely to result in trauma contributing to mortality.

Humidair incubators with automatic tilting trays are used. From personal experience, I can vouch for the quality of these machines. There is some discussion on temperature, humidity and candling. There is also good advice on using a hatcher when the egg is about to pip. Once hatched, of course, the little guy is hauled to the nursery.

The chapter on neonatal care and hand feeding goes through nursery management, temperature control and hand feeding formulas and utensils. These subjects are all dealt with in an easy to read dialogue that is basic, simple and very informative. There is a list of commercially available hand feeding formulas for parrots and an excellent home recipe made with primate diet (I had very good success using a similar but earlier formula also developed by Dr. Susan Clubb).

There are numerous drawings, graphs and charts that illustrate or list everything you need to know about hand feeding from day one through weaning. A lot of information is packed in the several chapters that deal with incubation and hand feeding. Even if the volume contains chapters that are too complex for you or otherwise irrelevant to your operation (Sarcocystosis in Psittacine Birds, Reintroduction of Military Macaw in Guatemala, for instance), the sections dealing with incubation and hand rearing are very worthwhile and should be studied. Actually, most true aviculturists will read the entire book, odd subjects and all, with great interest.

You can get the book from Avicultural Breeding and Research Center, 1471 Folsom Road, Loxahatchee, FL 33470-4942. Telephone (407) 793-5135. The price in the contiguous United States is \$53.95. Add three dollars sales tax in Florida. ●