



Artificial Incubation: food for thought & hatching assistance

by Carine Lavril
Honeydew, South Africa

Having artificially incubated many eggs and over a hundred parrot eggs, it is time for the Parrot Breeding Centre (P.B.C.) to share with our fellow aviculturists some information regarding this delicate subject.

The first and so very important point is the following question: why do baby parrots generally hatch more easily in the nest boxes with their mother than in an incubator, assuming the eggs were artificially incubated all the way? This question is very tricky since no one has yet answered it. In the "Proceedings" of the Association of Avian Veterinarians 1991, one can read these meaningful sentences: "Artificially incubated eggs frequently show lower hatchability than naturally incubated

eggs. In addition, eggs that have been naturally incubated for the first five to seven days may have higher hatchability than eggs that are artificially incubated for the entire developmental period. That these differences exist highlights the need for a wider dissemination of information on proper incubation methods. Identifying causative incubation factors demands a thorough understanding of artificial incubation management for both domestic and exotic avian species."

In the second sentence it is said that the eggs naturally incubated the first five to seven days may have a higher hatchability than the ones entirely incubated artificially, which is true: the longer a natural incubation, the higher the hatchability. This verb "may" means nothing is scientifically proven yet and a deep understanding of the process is still under research.

Inside an incubator the settings are perfect. We know now exactly at what temperature the eggs should incubate, what the percentage of humidity should be as well as the angle for egg turning and the number of times per day the eggs should turn. The Grumbach incubator, as I already wrote, is a very accurate unit and we achieve with pride at the P.B.C. with three of them and soon a fourth one, a very high percentage of hatchability, close to 95%. Thanks to these incubators, I have raised, up to present, about 150 chicks from the eggs.

But as precise as artificial incubation has become, nothing replaces the contact of the mother sitting closely on her eggs. At this point, we have come up with an explanation, but that does not mean it has to be the only one or that it answers every facet of this delicate question.

A living body generates energy. No one can deny that. This energy is transmitted to the embryo through the shell as it develops while the

mother broods. Actually, this energy transmission starts when the egg is being formed as the spark of life enters it with the fertilization. An egg infected with bacteria during its formation and while it traverses the entire length of the oviduct will survive for many days and even until hatching, living thanks to the reserve of energy transmitted by the mother and stored inside the egg nutrients. So the chick will hatch with a lot more energy if it can take advantage of the mother's brooding time. This is probably the only thing an incubator cannot provide.

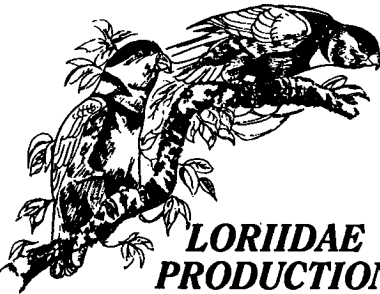
Artificial incubation will always remain a delicate operation and only dedicated aviculturists will achieve good results.

Hatching Assistance

Hygiene is the number one factor. It has been proven that manipulation of eggs with bare hands is very risky. The skin is a vector to bacterial infection and transmits easily and principally *Staphylococcus aureus* to the embryo through the shell and therefore increases embryonic death before hatching. An interesting fact is that gram positive bacteria occur mostly on the surface of the egg and the inside of contaminated eggs contain mostly gram negative bacteria. So the first step is to keep the incubator spotlessly clean and disinfected regularly. We use Virkon solution as it controls fungi, bacteria and viruses. Hands should be sprayed with the disinfectant prior to egg handling or surgery gloves could be worn. When the eggs are dirty, I warm diluted Virkon solution and gently remove the dirt and feces. This is a delicate operation and has to be carried out skillfully and rapidly. Some shells are quite thin and would break easily if roughly handled during the cleaning process. Also, if the liquid is too cold, contractions of the membrane could affect the embryo.

Presently, we work with three incubators, using one for the three last days prior to hatching with settings at 36.8°C (98.25°F) and 75% humidity. The chicks are always assisted carefully since non-assistance can prove fatal to weaker babies or to the ones hatching upside down, head in the small end. This happens once in while and if the chick is not carefully assisted, although in good and healthy condition, it would not make it.

Some cannot find the strength to



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pip through the membrane in order to access the air contained in the air cell at the large end of the egg. Candling is performed twice a day for each egg. Indeed, a dead embryo can infect the other eggs and should be removed as soon as it is discovered. When an embryo is dying or dead, the blood vessels disappear and this area just below the air cell turns white, after the blood vessels faded away.

Let us go back to a healthy embryo. As soon as the membrane at the large end retracts and shadows can be seen moving along the sides of the air cell, pushing the membrane upward, the egg is transferred to the hatching unit with the above mentioned settings.

After about 12 hours of activity, if no pip has appeared, the shell is delicately removed around the membrane (we do not use the egg capping technique, as we do not believe it to be safe enough. Infection can be transmitted to the chick from an infected piece of shell, and this is certainly not worth taking the chance. The membrane can be wetted with Virkon solution or warm, sterile water and this has proved successful enough to be pursued.

In order to humidify the membrane the use of a syringe comes in very handy and it can be kept inside the incubator as long as the tip of the syringe does not touch the chick or any part of the egg, otherwise the water could become infected. It can be repeated every six hours until the blood vessels are completely resorbed. If the chick has not pierced the membrane at all, it would be wise to use a disinfected needle and pierce a hole just below the beak, in between blood vessels if there is space enough to do so. This will allow the chick to breathe and can save it from drowning. When the beak is pointing out and the blood vessels are nearly resorbed, Lactated Ringer's can be given, one drop at a time every three to four hours until hatching is completed. This will give the chick enough energy through the whole process. Lactated Ringer's solution is highly recommended, especially in cases of dehydration. It is then vital to give Lactated Ringer's very often.

Once the membrane is totally removed, it does not mean the baby is ready to come out yet. It is tempting to pull it out but this is where danger is the greatest. The navel could still be wide open, finishing

the absorption of the yolk or the very last drop of blood from the last blood vessel. It is better to make sure the chick is not stuck to a dry area of the membrane along the sides of the shell. The head should be gently lifted upwards and a quick glance to the navel area will tell you if the navel is properly closed and no blood vessel remains attached to it. If this is the case, the chick is to be replaced at once in its original position inside the shell and Lactated Ringer's must be administered a couple of times before hatching. If the navel is closed, there will be a thin, empty blood vessel attached to it with the remains of waste (albumen and feces). The chick can then be gently pulled out of its shell and it will detach itself alone and in its own time if left resting along side of its shell. This should be completed in a couple of hours. Length of time is approximate since every chick has its own timing due to many different factors.

It is wise then to leave the baby alone until its first droppings, usually green from the digested yolk, to recover from the stressful event of its birth. The second reason is it needs to evacuate part of this yolk before any intake of food, otherwise it could get an impaction inside the digestive system. But there is no advantage whatsoever to wait 12 or 24 hours before its first feeding; this could only weaken it.

There are as many "cases" as there are eggs, i.e., some chicks have resorbed entirely the blood while the yolk remains unabsorbed. Unfortunately, in such a case, not much can be done except:

- avoid manipulation of the chick
- give it a drop of Lactated Ringer's every few hours
- apply Betadine solution to the navel area or onto the yolk sac at the same time Lactated Ringer's is given. The use of an eye dropper is the easiest method of application.

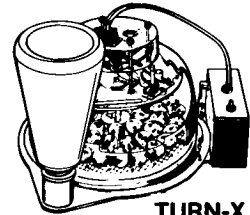
If the unabsorbed yolk is smaller than a pea, the chances of the chick surviving are higher. If it is larger, the baby will soon die.

After that, only time will tell if the chick will be all right unless it is infected with a bacterial infection.

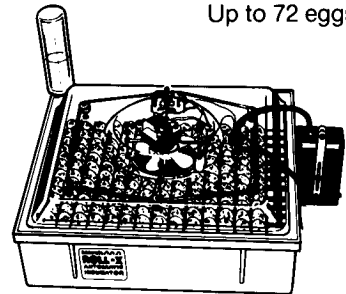
A mistake to avoid is to be too much in a hurry, too impatient to wait for nature to take its own course in its own time. From the first pip, a chick will complete its hatching process in 48 to 72 hours. ●

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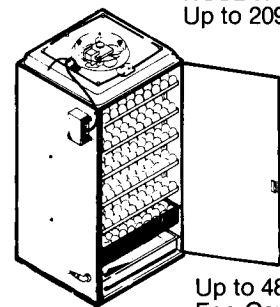
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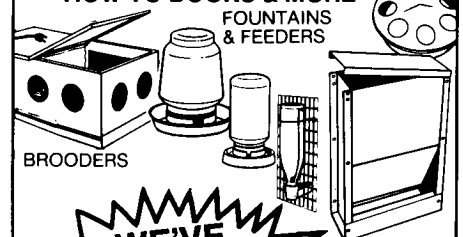
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