Artificial Insemination

*A lecture as given by Nigel Tonkin to the South East Branch of the Avicultural Society of South Australia.*

I was approached some 12 months ago to see if I would be interested in participating in this, your special night. The subject suggested was AI. I almost had to give an apology as I was also booked to travel at this time to Europe to judge in Switzerland, and Judge and talk on the Budgerigar scene in Australia in Sweden, and to enjoy the European hospitality. Unfortunately an illness prevented me from travelling so I guess you are stuck with me.

There has been considerable discussion of late on the subject of Artificial Insemination in Avian species and in the main budgerigars. I am no expert on the subject but I do follow AI happenings with interest.

I will be showing a few slides on the preparation of the bird through to collecting the semen, administering the semen to eventual chicks. I will also prepare a bird or two as a practical demonstration and hope like blazes that I have some luck in the collecting of some semen.

In the United Kingdom, budgerigar fanciers are not permitted to use AI for reproduction in their hobby, this is the only country that I know with these restrictions - how they would enforce the rule is beyond me.

I do not use AI but would if the need arose - the need may come around due to the damage of a Cock or Hen with 1 leg, thus making mating difficult. In endangered species, I would have no hesitation in using the AI process and I would encourage incubating the eggs and hand rearing of the chicks to re-establish numbers of that species.

The Macquarie Encyclopaedic Dictionary gives the following meaning for Artificial Insemination, a method of inducing pregnancy by artificial introduction of viable sperm into the canal of the cervix, widely practised on cattle and horses for the purpose of selective breeding. If one was to re word this to suit our purposes, the following could be said a method of inducing fertility by the assisting with the introduction of viable sperm into the vent of an avian species for the purpose of selective breeding.

Graham MeGuire, a budgerigar fancier from a Melbourne, Victoria suburb, has written articles and lectured on this subject over the last 2 years. I certainly do not wish to steal his thunder. He obtained a video from the USA on the subject and was very quick to perfect the art of extracting sperm from the cock and inserting into the hen with many positive results. I have visited Graham's establishment for the purpose of learning more on the subject. I also had a copy of the video sent to me from the USA, it is not very clear.

A Dr John Pilkington of the United Kingdom has also put pen to paper on the subject, I will no doubt throughout the evening pass on some of the information these fine gentlemen have put into print.

Reproduction   
The typical male reproductive cell, which is known as a sperm, is a motile (moving, or capable of moving spontaneously) cell with a head containing the nucleus and a whip - like tail with which it swims. The typical female reproductive cell, which is known as an egg or ovum, is a rounded cell many times larger than the sperm, and containing large amounts of cytoplasm surrounding the nucleus (Funk & Wagnell). The natural process among animals and plants by which new individuals are generated and the species perpetrated (The Macquarie Encyclopaedic Dictionary).

**Sperm Production Enhanced**  
The ovoid testicles of avian males are situated deep in the back of the species and are located close to the kidneys. In the cooler months the testicles of a Budgerigar are about the size of a pinhead after the shortest day. As daylight hours increase, the size of the testicles increase gradually to the size of a pea, giving a better chance of producing quality sperm in quantity. I have read that it has been recorded in some species that a 350 fold plus increase in the testes size has occurred during the breeding season.

**AI - Assisted Insemination**   
My view is that the system you are seeing tonight and the system that most fanciers talk on or write about could be called Assisted Insemination and not Artificial Insemination, although I guess one could not argue that the collection of semen is not artificial. We the fancier are not inserting tubes into the bird as in cows, horses, sheep and even turkeys and other species of poultry. We are just assisting the sperm via a tube to the cloaca of the female and from here nature takes over. The normal mating procedure is, after courting the male mounts the female, the cloaca of each join and actually turn inside out, semen is released and the sperm travel up to the ovary area. This sperm can remain 'active' for a long period of time. I have had a Cock bird die when egg one was laid by his mate and after the 7th egg was laid all were fertile, that is another 12 days later.   
In most Artificial Insemination procedures, the semen is collected, packed in mini or medium straws and stored in liquid nitrogen at a temperature of 196deg C. and then used on the selected 'client' at a later date. At this temperature, semen will last for years. Successful inseminations have been performed with semen stored for over 20 years. Semen could be relocated from area to area within a country or to another country, with the budgerigar it is all over in 5 minutes or it is too late, thus I continue to suggest the procedure, we are talking about tonight is Assisted Insemination.

**Preparation for AI**   
1/. Pair required birds or an infertile Cock to a required Hen.   
2/. Wait 8 - 10 days (Budgerigars) then remove all feathers from the vent area on both the Cock and Hen, including feeler feathers.   
3/. Either wait for egg 1 to be laid or, 'guess' that an egg is due to be laid in a day or two and start the AI process.  
A good guide to readiness, is the Hens droppings become large and loose in appearance.   
Have at the ready a plain glass capillary tube (the tube must not be Heparin coated as Heparin is toxic to sperm), the tube is to be used only the once and then disposed of.   
4/. Catch the Cock bird and hold in a way that exposes the vent area. Use a soft stroking motion drawing up from just under the vent. The tail is positioned dorsally, and with continued stroking, pressure is placed laterally on the cloaca to encourage ejaculation. If semen is not present after 6 -7 strokes, the Cock does not have semen readily available. This could mean 'not in season' or perhaps 'already ejaculated' prior to your attempted intervention. If there is semen present, let the capillary tube draw it in. If only one person present, the capillary tube needs to be held in the mouth for this process, either retain the tube in the teeth or put it down on a clean dry area. A modified massage technique is to simply apply pressure on both sides of the cloaca to empty the contents.   
5/. Catch the Hen and hold her, exposing the vent, stroke under the vent area to encourage the release of all faecal material. It is suggested that a tissue be used to 'mop' the vent area to ensure no faeces remains and in particular urates, which are even more toxic than the faeces to sperm.   
6/. Add further pressure to the vent area to expose the moist pink fleshy internal of the exposed cloaca.   
7/. Release the pressure and the 'suction action' of the vent will start and draw the sperm in.   
\* With larger avian species, it is essential that 2 or 3 people are involved in the collection and dispersion process to give a chance of a successful result.

**Note:**   
(a) From removal of the sperm from the cock bird to the insertion to the hen should not go any longer than 5 minutes as the sperm will harden and become glue like after this period and be of no value.   
(b) If all the faeces has not been removed from the hen prior to insertion of the semen, the hen may go to the perch after release and defecate, thus wasting the exercise.  
(c)If the cock defecates whilst semen collection is taking place, the exercise should be aborted at that point.

AI: Advantages = (A) / Disadvantages = (D)   
\* If a Cock or Hen has been injured AI and permanently disabled thus unable to mate, the procedure would be beneficial. (A)   
\* If a Cock or Hen is deformed from infancy and this procedure is used, the possibility is that a 'deformed gene' could be spread through an aviary with mass production of that deformity. (D)   
\* A quality Cock bird can be used to fertilise numbers of hens. (A)   
\* The potential is there to 'spread' unwanted genes, inherited bad traits. (D)   
\* If a family trait is low fertility then this system will over time increase the infertility problem either naturally or by using AI. (D)   
\* If used as a tool for saving endangered avian species. (A)

Research - Not the Available Dollars

In larger animals with commercial value, millions of dollars are spent on research into AI and, potential stud animals are tested for libido and perhaps milk production (cows) perhaps wool production (sheep) perhaps twin production (sheep) perhaps speed or staying power (horses). If there are failings in a particular family then the 'sire' may be culled and his close relatives further assessed for that failing. There is no such money available in the Avian Research bucket for such a programme (nor is there for any amount of other desirable/ required Avian research, mores the pity) nor will there ever be unless there is deemed by Government, a Commercial return at the end of the exercise.

