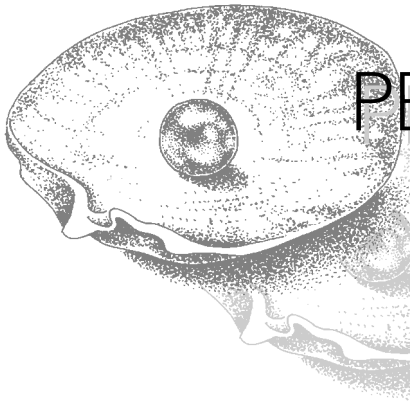

PEOPLE, PRODUCTS AND PROCESSES

Interview with a hatchery guru

Source: *Jewellery News Asia* (October 2002); reproduced in *Pearl World, the International Pearling Journal*

The following article by *Jewellery News Asia*'s Contributing Editor, Jennifer Henricus, appeared in the October 2002 issue and covers what is going on with one of the top marine biologists in the field, an old and dear friend of many in the business named Dr Bob Rose.

Australia-based Pearl Oyster Propagators Pty Ltd (POP) pioneered pearl oyster hatchery and cultivation technology in 1989 in Australia as well as in other pearl producing countries, including Indonesia and Thailand. Owned and managed by marine biologist and aquaculturist, Dr Robert Rose, POP has made numerous innovations in hatchery technology including stock enhancement or selective breeding to produce mantle tissue used to influence the colour and coating of South Sea pearls. Dr Rose and his team have also developed techniques and aquaculture practices that have contributed to successful farming of *Pinctada maxima* and *Pinctada margaritifera* oysters to produce saleable pearls. In this interview, Dr Rose talks about POP's innovations in the husbandry of pearl oysters, throws light on some of the techniques that influence [the] colour and quality of South Sea pearls and shares his vision for the future of pearling.

JNA: In your view, what is the most significant innovation in pearling that POP has made in the past 13 years?

Dr Rose: I feel that our greatest achievement has been to reliably and routinely produce large numbers of oysters for commercial production of South Sea pearls. We were among the first non-Japanese scientists to grow *Pinctada maxima* oysters from larvae and produce saleable South Sea pearls on a commercial scale, demonstrating to non-Japanese pearl farmers that by running a farm with hatchery, nursery and grow-out facilities it is possible to grow oysters that are as good as wild oysters and can produce commercial quantities of high-quality pearls.

Now we are typically able to achieve 97 per cent or more saleable pearls from a harvest of hatchery-produced oysters, with the pearls from the first operation averaging around 0.78 momme per piece. This was done using research results developed by a small team of biologists and myself at the Western Australian Fisheries Department, which was funded by the Australian Commonwealth Fishing and Research Development Corporation (FRDC).

The FRDC project was partly aimed at catching up with Japanese hatchery technology already established and to discover new technology that would propel the Australian pearl industry. In our case as well as with Japanese research, Australia was the starting point. Japanese scientists researched and developed the technology to pilot-scale level in Australia before moving to Southeast Asia and applying it commercially. We, too, had to go overseas first before we could apply the technology in Australia.

At the end of the Western Australian FRDC project, we set up POP and offered to establish a cooperative venture for Western Australian pearl producers, who at the time were producing all of their pearls from wild stock. The proposal was rejected and soon afterwards, Norman Analau of PT Moluccas Mariculture invited me to work with him in Indonesia. Once we demonstrated that it was commercially possible, POP began working back in Australia, as well as in Southeast Asia.

JNA: What is POP's involvement in pearling in Australia, Indonesia and Thailand?

Dr Rose: We have surveyed farm sites throughout Southeast Asia, designed and built six hatcheries

and three farm-based camps, operated them and trained staff. Often we have medium to long-term management contracts.

Our involvement depends on the perceived needs of the farmer. Generally we work with companies expanding or moving to uncharted waters of hatchery production. In 13 years POP has trained over 35 aquaculturists and reared at least 1.1 million oysters used for pearl cultivation.

In Australia we designed and supervised the construction of the Darwin Hatchery in the Northern Territory for Kim Male, a second- generation pearler, and Steve Arrow, a pioneer in Australian pearling. We also designed and supervised the construction of the Cone Bay hatchery for Maxima Pearling with David Jackson.

Overseas we designed and supervised the hatchery for KRI at Bacan, Indonesia, and in Thailand we designed and operated a hatchery for Robert Wan for *Pinctada maxima* oysters.

More recently, along with Kim Male, we had a vision to establish a pearl farm near the Gulf of Carpentaria. That vision led to the setting-up of two pearl farms belonging to Toomebridge and Arafura Pearls Holdings in Elizabeth Bay in the Northern Territory.

JNA: What are the benefits and disadvantages of pearling in Australia compared to Indonesia, the Philippines or Thailand?

Dr Rose: Australia is one of the last places where pearls can be produced on a commercial basis from wild oysters. The coastal waters of Western Australia are like a huge, natural nursery/grow-out habitat for young oysters. Settlement of juveniles into the area is routine and reliable each year. The natural survival levels are so high that it is economically worthwhile to put expensive divers onto large boats to comb the sea floor for these wild oysters. The farms are located in remote areas which are generally safe from pollution., theft and competing human activities. The disadvantages are the expensive operating costs and more recently the lack of marine areas suitable for pearl cultivation.

Factors affecting colour

JNA: What has your research in mantle tissue selection demonstrated about colors and coatings of pearls?

Dr Rose: Although the Japanese have been trying to manipulate the color of pearls genetically since 1947, our preliminary work has shown that the graft, or saibo tissue, used in the insertion of the nucleus, is very important in determining the white/silver colors of pearls, while the host oyster is not terribly important.

We have noticed that some of the yellow and golden colors are not determined solely by the graft tissue, and that there appears to be an interaction between the donor tissue, host oyster and marine environment.

Our findings supported those of Japanese farmers in Indonesia who had been working on this earlier, and our figures agreed with the work recently published at the World Aquaculture Society's conference in China this year.

JNA: When going for golden pearls, what are the innovations that ensure golden instead of cream or yellow?

Dr Rose: I'm afraid we cannot answer this question at present with any certainty. All we can say is that the production of golden pearls is less predictable than producing silver/white pearls.

The selection of saibo tissue from golden-lipped oysters can lead to the production of silver/white, cream, yellow or golden pearls. What does help to ensure golden pearls is that the mantle tissue is carefully selected from oysters with "strong" golden-lipped characteristics.

Hopefully our investigations into the importance of different shell color in young spat and juveniles, which is still in progress, will shed some light on this topic in the future. Interestingly, we have found that some of the color types seem to have poorer survival rates in different areas.

Environmental fluctuations

JNA: Are there signs of El Niño effects in the waters around Australia? How do you think this will impact on pearl production in the next few years?

Dr Rose: According to the Australian Bureau of Meteorology, there is an 80% to 90% chance that Australia will experience an El Niño weather pattern this year.

Generally El Niño occurs every four to seven years and lasts 12 to 18 months. An El Niño event will elevate seawater temperatures above normal and this will possibly affect food availability.

JNA: There is a theory that pearl oysters can be grown in inland seawater tanks away from all the environmental fluctuations, EI Niño effects, disease and other hardships of growing oysters in oceans. Do you subscribe to this theory?

Dr Rose: The late Michael Kallis of Broome Pearls once said you can grow tomatoes in the Antarctic if necessary, it is just a matter of cost. I have personally worked with *Pinctada maxima* for over 21

years and do not feel that keeping them in a tank is worth the effort.

It is a myth, in my opinion, that this predominantly subtidal, high-turbidity-loving bivalve is going to grow into a 2.7 to 50 kilogram animal and live for 50 years, not get sick, eat nutritious, fatty acid phytoplankton and produce 15mm pearls by living in a tank, unless the tank is the size of a very small bay with excellent water circulation.

JNA: Have you discovered the perfect place for pearling?

Dr Rose: No, everything is a compromise. However, one thing I have noticed is that whenever ventures set up in an area that has a single "bottleneck" opening connecting the farm to the open sea, the farms generally have problems related to water circulation and quality. Farms located in these situations have periodic mortality outbreaks among farm stock, widespread disease, toxic phytoplankton blooms or lengthy periods of extreme physio-chemical conditions, such as high temperatures, low salinities or low oxygen concentrations.

Making findings public

JNA: As a scientist, would you consider it important to make public your research findings for the greater good of the industry?

Dr Rose: As an applied scientist, I feel it is important to make available all of my research findings to the entire industry, providing the institution funding the work agrees to this.

In any case, the research should be relevant to the needs of the industry and should be of a fundamental or generic nature, such as improving our understanding of the oyster's reproduction, physiology, ecology and life cycle. Pearling companies can then use the information practically.

JNA: How has this been viewed by established producers who still continue to operate, often in great secrecy?

Dr Rose: POP became a service company because the Western Australian pearling industry rejected the cooperative idea back in the 1980s. Many of the big companies probably felt that moving from research into development would disrupt the status quo. These companies claimed that secrecy was a vital aspect to their business and simply did not wish to do business with us.

Not surprisingly, we were more valuable to smaller pearling companies as they were hungry to acquire a commercial edge. POP has trained many aquaculturists who now work throughout Australia and in Southeast Asia both in the private sector pearling and non-pearling industry and in public service.

The future

JNA: What are POP's plans for the future?

Dr Rose: To work with farmers striving to produce the "merino" pearl oyster, the perfect oyster that will produce the perfect pearl as did animal husbandry with the merino wool sheep.

Our motto is to bridge the gap between old and new with research and development; but most importantly, we will continue to embrace pearl specialist Andy Müller's most appropriate business rule: KISS- keep it simple, stupid!

Request for help with *Pteria* identification

Editor's note: We received the request below from Dr Pramod. *Pteria* taxonomy not being my strong suit (well, OK, *taxonomy* not being my strong suit), I took the liberty of offering him the most capable and eager assistance of the POIB readership, to help him in his quest. So, all you underutilised and under-appreciated taxonomists out there, here's a chance to strut your stuff. Please keep us informed of how it goes.

Dr Pramod writes:

Respected Sir,

It gives me immense pleasure to introduce myself as G. Pramod. I am a researcher in the Department of Marine Living Resources, Andhra University, India, and I have been working on fringing and patch coral reef pearl oysters along Visakhapatnam, northeast coast of India (eastern Indian Ocean) for the past three years. We have been analysing seasonal and annual trends in population structure, ecology, and use of different substrates by pearl oysters up to 10 km from the coast, over a stretch of 42 km, as part of the "Pearl Oysters Assessment Program of the northeast coast of India". We are facing a shortage of literature on identification of winged pearl oysters in tropical environments, as very little work has been done in India on these aspects and very few sources from international journals are available. I came to know about you through the

Internet, and discovered that you are engaged in studies on pearl oysters.

I request your help with the identification of *Pteria* pearl oysters. I sincerely hope you will understand our situation and will accede to my request and help me with this identification. I will be glad to furnish any further information regarding our work.

Thanking you. Yours truly,
G. Pramod

Dear Sir,

Thank you very much for considering my request. Your honour, in India we have very few bulletins for identification of pearl oysters and corals. I would be grateful if you could present my request in the forthcoming POIB issue. I have been studying benthic invertebrates along the rocky intertidal areas of the northeast coast of India, and especially pearl oysters found attached to sea fans. I have encountered two species of *Pteria* sp., which are yet to be identified. I would be grateful to any scientist who could help me with this identification. I can send them pictures of these two species. I have encountered *Pteria* sp. attached to six species of colourful sea fans (Gorgonids). I am currently searching for sources of identification for sea fans, and *Pteria* spp. I am studying their associations with other hard structures: associated fauna like sponges, polychaetes, fouling organisms, and the depth to which they are encountered, etc. The bulk of my collection comes from drift nets, bottom set trammel nets (three layered net), fishing hooks, and from divers in shallow water areas searching for ornamentals. Other avenues including scuba diving are also being explored.

Thanking you. With warm regards,

G. Pramod
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MOP nuclei for seeding pearl oysters

From: Dr Stefan Maser (14 October 2002)

Dear Neil,

I guess you still remember that we are a manufacturer of perfect, round white MOP nuclei from *Pinctada maxima*. Besides our very competitive prices I would like to emphasise that our nuclei are polished without any chemicals.

Besides unglued MOP nuclei, we produce also glued MOP nuclei up to 20 mm diameter. In this context, I want to point out that our used glue is developed and applied for medical human purposes and is therefore absolutely not toxic. I can say with our seven years experience that:

- the glue has not caused any undue deaths, and
- there is no conspicuous fracturing during gestation period.

That means the expense for larger white mussel shell nuclei is no more necessary due to the cheaper and absolute comparable covering of pearl nacre on our MOP nuclei. In other words; pearl farmers will save time and a lot of costs, they are in a position to increase their profits significantly!

We are able to supply unglued MOP nuclei up to 12.7 mm diameter and glued MOP nuclei up to 20 mm diameter.

Now we are seeking pearl farmers contacts. Can you publish this request in the next issue of Pearl Oyster Information Bulletin? Your support is greatly appreciated.

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