

MASWA Newsletter

(July 2001)

ATTENTION: This month's MASWA meeting is on Wednesday, **25th May**. Check your calendar, because it could be the day you receive this!!!

This Month's Meeting

By Nathan Cope (President - *David was away all this month, so I'm the Ed one last time*).

The meeting is to be held at **Wayne Mothershaw's** house. Wayne has never had a meeting at his house before, so we currently have no idea what sort of aquarium setup he has. Incidentally, Wayne is MASWA's representative to the Marine Aquarium Society of Australia and will be giving us a rundown on what is happening with the set up of MASA and with hobbyists' conflict with Senator Robert Hill.

Most of us have the luxury of being able to relatively constantly monitor our tanks and make any necessary adjustments immediately if problems pop up. There are a few, though, who must be away from their tanks for lengthy periods of time. Wayne is one of these people, as he works offshore quite a lot. It will be interesting to see what sort of contingencies he has in place for emergencies and daily upkeep of his aquarium. Is it all automated, does he rely on understanding neighbours or do knowledgeable family members keep his aquarium going? To find out, be at **35B Marshwood Retreat, Bibra Lake** for this month's meeting. The meeting will begin at **7.30pm**.

Last Month's Meeting

By David "Speckles" Bloch (Secretary/Newsletter Editor)

Last month's meeting was at the residence of David Bloch (me!) in Noranda. The meeting was highlighted by the fact that we had our first ever election of MASWA committee officials. More about that later in the newsletter.

David's tank was looking really great and his corals had really grown since we had last seen his tank. The meeting was really well attended and it was great to see some faces that have been absent for a while. David had cleaned most of the algae from the glass of the aquarium but small uncleaned patches could still be found!!! A plague species of algae called *Valonia* was also seen in David's aquarium and to his dismay one of the members commented on how beautiful it was and wanted some.

David's tank is a 4ft X 2 ½ft X 2ft glass aquarium and has been set up since January 1999. The aquarium is set up as a "Berlin/Live Sand" system with a sump, downdraft protein skimmer and calcium reactor. Wave motion within the aquarium is simulated by a wavemaker that alternately turns on two pairs of 1500L/hour powerheads. The lighting consists of two 400W 6000 Kelvin Metal Halide lamps and two 4ft blue fluorescent lamps. The metal Halides are on for 10 hours a day and the fluorescent lamps are on for 12 hours a day.

Within the tank there are around 25 species of SPS (small polyped scleractinian) corals comprising of *Acropora*, *Pocillopora*, *Stylophora*, *Seriatopora*, *Montipora* and *Porites*. There are also other species of hard corals in the aquarium including *Fungia*, *Galaxea*, *Euphyllia* and Brain Corals. There are also a few soft corals in the aquariums. The tank contains around 22 fish species and one coral banded shrimp.

Desperate Request for Aiptasia!

By Nathan Cope

A little while ago, I wrote about Tennille Irvine who is doing an Honours Degree in Marine Science at Murdoch University and examining the relationship between temperature and bleaching in Anthozoans (in this case, *Aiptasia* anemones). Well, her experiment crashed due to someone turning off the lab heaters and all her *Aiptasia* dying. Consequently, she needs plenty of *Aiptasia* again. If you have any or know someone (or somewhere) who does, please let Tennille know.

The *Aiptasia* have to be fairly easily removed from their current location. If they are growing on your aquarium's glass, that is the best, because she can collect them with minimal damage to the animals (I was quite happy for her to remove around 200 of them from my overflow box). Tennille is also happy to take *Aiptasia*-covered rocks but only if you are happy to have them removed from your tank for the duration of the experiment. If you think you can help out Tennille, she would be very appreciative of you giving her a call during the day on **0411 55 6362** or at home on **9364 7771**.

MASWA's Official Committee

By Nathan Cope

Last month, we had our first ever election of the official MASWA committee. We have had a few people such as Paul Groves, Andy Dolphin, David Bloch and myself acting in an unofficial capacity in the past but it was decided by David and myself (incumbent unofficial committee), that this was no longer appropriate. There are several reasons for this but these are two of the more important ones:

- Leaving the entire running of the society to one or two people (David and I have had it fairly easy compared to Paul and Andy who basically ran it by themselves) is very stressful for those people. Due to being Jacks-of-all-trades, we are forced to divide our time amongst all society duties and that usually means that only the essentials (such as writing the newsletter) end up getting done. For example, one of the duties that has really been neglected in the past is developing our society's goals and then steering the society in a direction to help it reach those goals.
- In order to be able to exert some influence on issues directly affecting our hobby, such as the conflict with Senator Hill over his unilateral decision to cease coral collection on the Great Barrier Reef and the recent temporary (potentially permanent) ban in WA of recreational coral and live rock collection, we need to be viewed as an organised and informed society that can be taken seriously... that's made all the more difficult because it seems few organisations who really count even know we exist!

Currently, our society is the only one in WA that specialises in keeping marine organisms, yet it is embarrassingly absent from the "Ornamental Fish Societies and Associations in Australia" listed in the Fisheries WA publication, "Ornamental Fish – An Aquaculture Opportunity". One of our society's goals is to try to reduce any impact our hobby may place on natural stocks by promoting, where possible, the acceptance and breeding of captive raised animals. Consequently, our society should be a primary contact in WA for this topic as, collectively, we have a vast range of applicable knowledge.

That should give you an idea of why we thought we needed a committee, so we took it to a vote at last month's meeting. Voting was by secret ballot and each attending member was given a piece of paper with all the committee positions listed on it. Each person was asked to write next to each position the name of a member that they thought would be best for that job. Once all ballot papers were collected, the votes were counted up. We needed a minimum of eight committee members (according to the Associations Incorporation Act 1987) but there were only six named positions; President (Chairperson), Vice-president (Vice-chairperson), Secretary, Treasurer, Newsletter Editor and Social Coordinator. It was decided that after all the named positions were filled, the two next most frequently voted people would fill the general committee positions.

With over half of our financial members in attendance, we feel the votes gave a very accurate indication of who the general membership felt should be overseeing our society – especially as all positions were won by an overwhelming majority. The results of the voting were:

President –	Nathan Cope
Vice President –	Sid Harrison
Secretary/Newsletter Editor –	David Bloch
Treasurer –	Paul Tayler (the only unanimous vote!)
Social Coordinator –	Tony Fiorentino
General Committee –	Frank Krause, Jan Anderson, and Darren Collins

You may have noticed that David ended up with a combined Secretary/Editor role - despite six different people being voted for each role, all except David only received one vote. Luckily there was a tie for the second general committee member, so both were asked to come on board. So that makes eight! The positions of Secretary and Editor are both quite labour intensive, so it may be necessary for the task of "minute taking" to be rotated each month among the three general committee members.

I know I can speak for all those elected when I say that over the next 12 months, we will endeavour to do our best to fill the required tasks of our respective positions. Having said that, remember that you can only get out of your society what you are willing to put into it. So please, be as helpful as possible if any of your committee members ask you to contribute in any way to the duties that they must perform.

Cycling a Marine Aquarium

By Nathan Cope

Many of you probably feel quite comfortable with the process of cycling a new aquarium, but do you really know which components of the cycle are necessary and which are mythology?

I recently had an email from a beginner in the US who wanted to know if it was okay to do a water change while he was cycling his aquarium. He was cycling his 180 litre tank with four Chromis (on advice of his local fish store) and was concerned because they were looking a bit sick (probably) due to the excess ammonia and nitrite. The staff at his local fish store had told him that a water change was a waste of time and would in fact be detrimental to the health of his aquarium.

Are fish needed to cycle a tank?

First of all, it needs to be firmly implanted in everyone's mind that if you intend to use live rock in your system (as this guy was), there is absolutely no need to submit some poor damselfish to the stress of toxic waste products in order to start and stabilise your biological filter. A couple of chunks of fairly fresh live rock is all you need to well and truly cycle your tank. Even if you are not going to use live rock in your tank, there are other methods you can use to cycle your tank where you don't have to use live fish.

Are water changes okay?

The short answer is, "Yes". If you wish to do a partial water change, of whatever percentage, to dilute ammonia and nitrite whilst cycling your tank, then by all means, do it. You have to remember that the biological filter is for the benefit of your animals, not the other way around. Live rock (hopefully) has invertebrates living on and in it, and the less waste compounds that they are exposed to whilst they are contributing to the cycling of the tank, the more likely they are to survive. The biological filter may take a little longer to fully stabilise (this will be discussed later) but your inverts and/or fish will be less stressed and therefore more healthy, "happy" and less likely to bully each other (of course, if the animals are incompatible with each other, it won't matter how you cycle your tank, bullying will still occur).

So what is going on when you cycle a tank?

Well, you are establishing a fully functioning, established and stabilised nitrogen cycle in order to process your aquarium's toxic waste compounds into less harmful compounds. This process is performed by different species of bacteria. One species of bacteria breaks protein down to ammonia (this process is called mineralisation), a second species then converts the ammonia to nitrite and a third species converts nitrite to nitrate.

There is one more phase to the nitrogen cycle where nitrate is converted to nitrogen gas by a fourth species which may or may not be one of the three species from the previous three phases. This phase only occurs in low oxygen environments such as in deep sand beds and inside live rock and is not really relevant to cycling a tank, so it won't be discussed any further in this article.

The real workers

Incidentally, older books will tell you that it is bacteria from the genera *Nitrosomonas* and *Nitrobacter* that convert ammonia to nitrite and nitrite to nitrate in your marine aquarium. This is old and outdated information probably based on scientific data from soil and sewerage samples. It is now known that neither of these species exist in salt water and in fact only one of them exists in freshwater. The only nitrogen consuming bacteria confirmed to be found in any number in saltwater so far are from the genus *Nitrospira*.

Prior to this discovery, you could find bottles with names like "Bacterial Booster" on the shelves of your local fish store and the label said that the bottle was jam-packed with *Nitrosomonas* and *Nitrobacter* bacteria. These additives touted themselves as being essential to a quick and safe cycle of a marine aquarium. Of course, now we know that these bacteria don't even exist in marine aquaria, so these additives obviously did nothing. That wasn't a problem to the manufacturers of these additives, they just changed the labelling on the bottles so that they now say the bottle contains *Nitrospira* bacteria (I'm assuming they also changed the contents of the bottle too, but it doesn't really matter, does it?).

Working 24/7

Most people talk about the nitrogen cycle as though it is something that occurs once a day - almost as if the bacteria wake up in the morning and go to work for the day to do their conversions and then go home at night and sleep. In fact the conversion of protein to ammonia to nitrite to nitrate is constantly happening in an aquarium and the conversion from one compound to the next is an extremely rapid process (taking less than a second). What is needed for a stable biological filter, though, is enough of the relevant bacteria to be able to convert all of these compounds at the same rate the compounds are being produced by the constant decay of food, decay of faeces and direct ammonia excretion from live animals. It's easy to tell when there are enough of each species of bacteria, because your ammonia and nitrite levels will have dropped to zero after going through the spikes that people typically see.

Why are there spikes?

The problem with a new tank is that there are not enough of these bacteria to do the conversion at the rate that the compounds are being produced. Consequently, the toxic compounds build up and up. When the bacteria finally multiply to a large enough population to be able to convert all of these accumulated compounds, the accumulation of toxic compounds suddenly ceases and now begins to rapidly fall. This is what causes the spike to occur.

Of course, at the peak of the ammonia and nitrite accumulation, there is far more ammonia and nitrite than would normally be produced at the fairly constant, day-to-day rate of waste production. So there are now *too many* bacteria for the rate at which the waste compounds are being produced and now the bacteria start dying off due to starvation. Consequently, the bacterial population now dies back to a level that is only large enough to be able to convert the compounds at the same rate as they are being produced.

Why does the nitrite spike occur after the ammonia spike?

Bacteria only multiply in response to excess nutrients. The bacteria that convert ammonia to nitrite and nitrite to nitrate are initially present only in small numbers. To begin with, the ammonia-converting bacteria start producing only small quantities of nitrite due to their limited population. As the ammonia-converting bacteria multiply and start to produce more and more nitrite, the nitrite-converting bacteria now have excess nutrients, so can now start increasing in number, too. Of course, because the nitrite-converting bacteria have to wait for the ammonia-converting bacteria to provide them with nutrients, they will always lag behind in reaching their peak population levels and consequently the nitrite spike will always follow the ammonia spike.

Would 100% water changes cause a tank to stop cycling?

Because we only need enough bacteria to be able to convert the compounds at the same rate as they are being produced and because these compounds are constantly produced (ie, the bacteria don't stop work and go home at night to sleep), theoretically you could set up a tank and from day one, do a 100% water change every day for a month and at the end of that month, your biological filter would have stabilised.

Why does this work? Well, despite our 100% water change, the nutrients are still being constantly produced during the 24 hours prior to each water change and during that time, the bacteria will begin multiplying in order to reach a high enough population level to be able to convert the compounds at the same rate as they are being produced. But, because we are doing a 100% water change, we won't get a rapidly increasing accumulation of toxic compounds, so when we do eventually see the spikes of ammonia and nitrite, they will be at very low levels compared to the "no water change" scenario and therefore the animals in the aquarium won't have been very stressed during this period.

Will big water changes slow down the cycling?

Almost constant 100% water changes may mean that the cycle takes longer to stabilise but this is not a definite. Although bacteria do multiply faster when nutrient levels are higher than the needs of the current bacterial population level, the rate of multiplication plateaus quite quickly once the nutrient level reaches a certain point above the population's needs.

Hopefully this article has helped shed a little light on what is going on when an aquarium is first put together. Because misunderstanding of aquarium setup is so prevalent in the marine hobby, MASWA's Secretary/Editor has suggested that a version of this article (edited for use in aquarium stores) be produced and distributed to WA stores selling marine animals. If you feel strongly for or against this idea or have constructive suggestions, please contact David Bloch and let him know of your thoughts.

Upcoming Meetings

July 25 th :	Wayne Mothershaw 35B Marshwood Retreat Bibra Lake
August 29 th :	Darren Collins
September 26 th :	Sid Harrison
October 31 st :	Tom Devilee
November 28 th :	AQWA
December 19 th :	Nathan Cope

MASWA's World Wide Web address

The website is temporarily offline.

Newsletter and General Inquiries

to Nathan Cope on (08) 9367 9251 a/h
or 0416 09 2000 b/h

Membership and Treasury Inquiries

to David Bloch E-mail address:

aguatech@opera.iinet.net.au

or phone on (08) 9375 2438 a/h

MASWA Membership

Currently MASWA requests an annual \$22 donation from adult members, \$11 from Junior members. This covers the cost of newsletters, drinks, nibbles and other costs associated with the society. Members will receive information sheets and discounts on some products.

Friends in Common

Jan Anderson, Lissa Beaufond, David Bloch, Darren & Raqual Collins, Nathan Cope, Tom Devilee, Andy Dolphin, Tony Fiorentino, Paul Groves, Sid Harrison, Robert Harwood, Simon Hawke, Frank & Ben Krause, David Lee, Grant Magill, Phil & Caron Melvin, Wayne Mothershaw, John Ryan, Phil Searle, Ronald Tan, Paul Tayler, Greg Weryk.

If you've paid your money and your name is not on this list, tell David! Members on the web should check they are on the web site members list.

If there is anything you would like to know more about or anything you would like to add to the newsletter, call or send comments to the current editor, Nathan Cope. Remember, this is your newsletter.

DISCLAIMER

The Marine Aquarists Society of WA is a name that we, as a group of friends with like interests have applied to ourselves for the purpose of information exchange. No one person, nor the group as a whole, can be held responsible for liabilities, injuries or other that may result either directly or indirectly as a result of our gatherings or the information exchange therein. The same applies to the information contained in this newsletter.