

Growing with the flow: the aquaponics garden at Basin View Masonic Village

Basin View Masonic Village is a 50-person aged care residence, in a small town 200km outside of Sydney, and it has taken sustainable living, aquaculture, resident engagement and community involvement to an impressive level. In 2011, the Masonic Village designed and built a large aquaponics garden with the help of the Earthan Group, a sustainable environmental design company. The result is a large dementia-friendly garden which can produce 350kg of fish and 150kg of yabbies per year, as well as supporting vegetables, flowers and fruit trees. The garden has transformed village life by involving most of the residents, including the 20 people with dementia, as well as their carers and family members.

Aquaponics

Aquaponics is also referred to as 'integrated aquaculture' – the practice of growing fish and edible aquatic animals together with plants. In its most ancient forms, aquaponics has been practised in China and other parts of East Asia for thousands of years, where farmers cultivate various kinds of fish, shellfish and freshwater eels alongside their crops in rice paddies. The animals have three main benefits: they clear effluence and algae, they produce fertiliser for the plants, and they are able to be harvested and eaten as a secondary food source. Aquaponics has become recognised in the USA, Canada, Bangladesh and Australia for its ability to provide large amounts of food from a small space in a sustainable way.

When an aquaponics system is constructed around renewable energy, as the garden at Basin View is, the energy demands for a successful aquaculture garden are very low. The Basin View garden has a pump which is powered by solar panels. Because of the self-sustaining cycle of the garden, maintenance requirements are extremely low – a definite requirement for the garden to be well-used by people with dementia.

From paper to planting

From the beginning, the residents of the village were involved in the design process. Initially, the idea for an aquaponics garden came about "because it was different", but soon evolved into a massive bottom-up process, spearheaded by people with and without dementia

Fish, yabbies, water, plants and art have come together in an integrated aquaponics garden designed to be accessible for people with dementia – the first of its kind in Australia.

By **James Baldwin**



Above: Six months after completion, the garden is blooming with life

Left: A view of the garden showing one of the mosaics made by the residents and staff

living in the village. Denise LeRoy, the village manager, and Leonie Fleming, project coordinator, ran the project along with the 'garden ambassadors' – a collection of residents of all ages and levels of health who helped design and determine the features of the garden. They ranged from older people without dementia who live in independent cottages, to people with quite advanced

dementia living in the dementia care unit. They were adamant that they were not a committee: "...because committees sit around and talk, but don't ever do any work."

The garden ambassadors, along with Denise and Leonie, decided on what they wanted in their garden and compiled a list of requests. From the beginning, goals were diverse: accessibility for people with

dementia was a major issue, but so was beauty, the ability to grow flowers and food, and the presence of shelter and quiet places to rest.

The man who bought their dream to life was Paul Van der Werd, an experienced aquaculture designer and director of Earthan Works, aquaculture and integrated gardening specialists. Paul received: "...a brief with a very long list of functions and items they would like incorporated in the design."

The garden is based around a three-part structure in the shape of a flower, which was created to allow access for wheelchairs, walkers, and supported exercise. There are three fish tanks, with one aquaculture tank each serving one third of the garden. Each section of the garden has a deep-water culture tank, a media bed to filter the water, and raised horse-shoe shaped soil and gravel beds ('Earthan beds') which are used to grow mature plants.

The water starts its journey from large storage vats, which are buried in the ground to keep the water at a constant temperature. The water is aerated and pumped out from the vats by a solar-powered pump system to the aquaculture tanks, where the fish live. The fish add nutrients to the water, which is circulated to the deep-water culture beds. These beds are where the yabbies live.

The water is used to start seedlings and cultivate leafy green vegetables on floating foam trays. Any detritus – wasted feed and effluence from the fish – sinks to the bottom of the bed, where it is eaten by the yabbies.

From there, the water is filtered through the media beds, which are filled with a mixture of gravel layered with porous clay beads. This filters the water of impurities, as well as providing a base for clay-soil loving plants. From the media beds, water flows to the Earthan beds, which are layered with gravel and soil. This provides the perfect base for any number of plants, as the beds are constantly moist, kept at a warm temperature through being raised off the ground, and are fertilised by the clean, nutrient-rich water from the aquaculture tanks.

The last stage of the cycle sees the water flow from the earth beds, back to the filtration vats. Besides being aerated with a large 'air cross', the vats have plastic beads which encourage the growth of bacteria that feed on ammonia – a common by-product of animal husbandry. The bacteria convert the ammonia to nitrate, one of the best natural fertilisers for plants. This also deters algae growth. The oxygenated water heads to the aquaculture tanks to begin the cycle anew.

At first, Paul and the Masonic Village team figured that they would be able to build the garden in two weeks. However, the project was severely hampered by heavy rainfall and nearly abandoned due to the weather. It was the residents who fuelled the completion of the garden – the garden ambassadors, as well as the other residents of the facility, motivated the centre managers to keep on trying. "We saw this would be something special," Denise said, "and because the residents were so positive, we made it through."

Links to the community

One of the most satisfying outcomes for the staff and residents has been the way in which the garden has helped to link the different areas of the Masonic Village – the hostel, the independent living units, and the dementia care unit – as well as expanding connections to other community organisations.

"One of our goals was to bring the community in," Leonie Fleming, the project manager, stated.

Community was a core focus of the project, and was initially achieved by involving residents of all levels of capability, and then by bringing in local school and scout groups to help build the garden alongside Paul and the Earthan team. It was this persistent cooperation between people – young, old, with dementia and without – which saw the garden through to completion.

The garden has been good for the residents. Denise and Leonie both noted that the garden engages the people with dementia and helps them reconnect to the outside world, as well as providing exercise and stimulation.

Many of the residents with dementia are particularly inspired by the flowers, while others simply enjoy the peace of the outdoors.

Leonie recalled visiting the garden with a woman who had advanced dementia, and who rarely spoke to any of the staff or other residents and who had not demonstrated any short-term memory retention.

When she and Leonie returned to the facility, she retained some memories of her visit to the garden, and told her nurse: "Yes, it just made me feel so peaceful." A couple living in the Masonic Village wish to renew their marriage vows in the garden. It also continues to bring people to the grounds of the care home, opening an inter-generational gateway between residents and the community.

Though there are other garden projects around Australia for people with dementia, such as the specially designed 'sensory garden' at a Bupa care facility in Banora Point, NSW, the aquaponics garden at Basin View is the first of its kind in Australia, as it combines an integrated system with accessibility and a variety of features driven by the residents of the facility.

Basin View Masonic Village welcomes visitors and queries about their garden. Contact Denise LeRoy at: dleroy@royfree.org.au

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Display board showing design and details of the aquaponic garden

The spiritual is one of the most intimate characteristics of the person, and has two main aspects: the formally religious and the non-specifically spiritual. They both must be respected.

For some people a certain set of tenets has guided their thoughts all their lives. In Western societies these have been predominantly Christian. For such individuals each new life experience has tended to be referred to the principles and attitudes to life which stem from that particular orthodoxy. Dementia can pose a challenge to even the most strongly-held belief system.

One of the first first-person accounts of dementia to be published was *My journey into Alzheimer's disease*, by American clergyman Robert Davis. He was a man of steadfast convictions, filled with the passion to promote his faith. At first panic and despair set in. Then he experienced a revelation: Christ spoke to him and urged him to cease struggling.

Another reaction sometimes encountered is that of rejection. A person can take the onset of the condition personally and angrily accuse God of having deserted them. This is a position which it is difficult for others to counter except by patiently emphasising positive approaches. This is not made any easier if the carer does not share the beliefs which the person is questioning.

Susan Miller (2003), the American novelist, takes the view that his strongly held beliefs served her father well at the onset of dementia. She wrote: "He thought of this illness without ego, precisely without the sense of self and grief for the loss of self that would afflict me if I found I had Alzheimer's disease."

Many people, while not subscribing to a particular creed, see themselves as having spiritual needs which must be met. The great milestones of birth, love, loss and death give rise to feelings

Seeking the spiritual

John Killick explores the links between the dementia journey and spirituality. The second of a series written exclusively for the AJDC, John's views are based on two decades of working with people with dementia in Australia and the UK



Engagement and rapport – vital parts of the spiritual experience (John Killick is pictured on the right)

in everyone which, whether they choose to recognise it or not, are occasions with strong spiritual implications. Dementia, experienced by the individual and by their family and friends, must surely now be added to the list of significant shared events in the lives of a large number of people.

Christine Bryden (1997), an Australian who has dementia, is speaking to those without the condition but on behalf of those with it when she asks for the whole issue to be widened out in these words: "Spirituality is not simply what religion we might practise; it is important for you to help us re-connect with what has given us meaning as we journey deeper into the centre of our being, into our spirit."

The big question is this: does dementia have the capacity to engender change in the spiritual realm as well as in the physical and mental? I believe it does. It may even be the case that the very decline of

reasoning ability releases in some individuals a new capacity for spiritual development. It certainly forces us to value the person in their essential self rather than for any other values (economic, political, intellectual) which society upholds as paramount, and which have a tendency to obscure qualities such as honesty, truthfulness and transparency. Dare we even admit to ourselves the possibility that people with dementia could show us the way to identify and cherish the fundamental values we all share?

The Australian writer Beth Shirley Brough (1998) seems to claim something like this in relation to Reg and herself: "In communion with Reg, my beloved soulmate, I have grown in stature and spiritual independence. Our cherished inter-dependence has provided the companionship in which we can both increase the depth of our inner knowledge and experience."

And an American carer, Beverly Murphy (2004), puts it this way: "If you believe in the concept of a soul, then you have to believe that the soul doesn't get Alzheimer's any more than it gets cancer. Maybe the soul has an awareness of life around it that transcends the body or the ability to communicate... Maybe, just maybe, our people have the unique experience of being able to live in two worlds, ours and a freer one that allows them access to insights and awareness we can't even begin to fathom."

A lady with dementia said to me one day:

There's beauty in everything if you look for it: the sky through the skylight, in colours or not.

It depends on your mood.

Oh I went to look up in the sky and saw it shining there and said "That is Life."

Are you going to take me to see the sun?

There are just too many accounts of being put in touch with special experiences through people with dementia for us to ignore this phenomenon. Here are two other family carers describing what it meant to them. First of all, Pat Grimshaw (1999): "My mother introduced me to an unseen world, one that she saw quite clearly and sometimes heard quite distinctly, that I knew nothing about."

And now Deborah Shouse (2006), not attributing this to premonitions of another world but fixing it in the here-and-now of intensified relationship: "I sink into my mother's face like she is a

meditation. We smile at each other for a half-hour, something we have never done before, something that would be too intense, too personal in our earlier, rational life together. Then her eyes gently flutter shut. I feel like I've been on a mystical retreat. I feel a rich sense of renewal and hope."

It seems that my examination of the phenomenon of spirituality and dementia is leading me to the same conclusion as with many other aspects of the condition: that we are confronting a great mystery. The more we think we know the less we actually know about the subject. But one thing I will assert. The spiritual should not be neglected in our great rush to solve the physical dilemmas posed by dementia.

I leave the last word to Christine Bryden (1997), the remarkable Australian spokesperson on this subject: "This unique essence of me is at my core, and this is what will remain with me to the end. I will be perhaps even more truly 'me' than I have ever been."

For more on the topic of dementia and spirituality, the books written and edited by Elizabeth MacKinlay of the Centre for Ageing and Pastoral Studies in Canberra and published by Jessica Kingsley, London come highly recommended by the author.

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Transforming health care for residents with dementia

Churches of Christ Care Queensland have embarked on a self-funded project to develop a Centre for Excellence in Dementia Care at the Churches of Christ, Queensland Campus, in Mitchelton. The site consists of three 'cottages' adjacent to the main nursing home. Each cottage is home for 12 residents who have a primary diagnosis of dementia.

Historically, access to timely and appropriate health care for residents with dementia has been problematic. There has been difficulty accessing general practitioners (GPs) quickly, and as a result, acute illnesses are often not treated in a timely manner. This results in many unnecessary transfers to emergency departments. Current research literature tells us that persons with dementia do not fare well in busy hospital emergency departments or during hospital admissions, so it is best to reduce this whenever possible.

One solution to this problem has been the introduction of an aged care Nurse Practitioner (NP) role to the team at Mitchelton. Although the NP also works across the general high and low care areas, she provides significant support to the dementia cottages. A Nurse Practitioner (NP) is a Registered Nurse who has undergone higher education and training which allows them to function in an advanced clinical role. According to the International Council of Nurses, an NP, or 'Advanced Practice Nurse', is: "...a registered nurse who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which would be determined by the context in which s/he is credentialled to practice" (International Council of Nurses 2011).

Rosanne Fleming writes about the Centre for Excellence in Dementia Care in Queensland: a cluster of cottages for people with dementia, and a Nurse Practitioner in attendance too

The NP is contracted by Churches of Christ Care and paid an hourly rate, and is able to charge Medicare rebates for those services which meet the requirements of the Medicare schedule for reimbursement. Currently, the NP has access to four items on the schedule which range from \$8 to \$48.85 at the bulk billing rate. These items are for time-dependant interventions with the resident.

The NP is a familiar figure around the cottages and is able to identify individual changes in residents' health status, as well as being able to medically assess residents, order necessary diagnostic tests and prescribe medication. Follow-up is easy and residents who do not respond to initial management and treatment are forwarded on to a GP with a referral from the NP and a request for urgent attention. When appropriate, the resident is referred to the emergency department, via the Hospital in the Nursing Home Team. Transfer usually occurs only if the issue is considered serious or life threatening. However, while the transfer option is available, to date there have been very few transfers to emergency departments since the project commenced in mid-2011. Generally, transfers are related to a diagnosis of a suspected fracture which might require specialist intervention, or for a very significant and unexpected change in the health status of a resident.

Another benefit of the NP role has been the ability to provide palliative symptom management and support for four residents who had a primary diagnosis of dementia, but who died recently in the

cottages from other causes, such as cancer or cardiac arrest. Having an advanced care nurse on site meant that these people were able to remain in their familiar place of residence until they passed away, rather than having to be transferred to another facility.

Residents are supported to remain healthy and comfortable through the advanced skills and interventions of the NP. The NP also assists residents and staff to minimise behavioural and psychological symptoms of dementia, so most days residents experience a calm, comfortable and happy life in the cottages.

The Centre for Excellence in Dementia Care project is undergoing a comprehensive evaluation and one aspect will involve a review of the effectiveness of the NP role. An interim report was expected in June 2012.



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