

Are we tapping too much?



“As dams and rivers dry up, many...are seeking water from deep underground. But are we tapping too much?” asks Darren Gray (*The Age*, 29.09.08)

CONTEXT

News about our main river system the Murray-Darling is very sobering this morning, and implications for Adelaide’s water supply are likewise worrying. Peter Andrews, in his book *Back from the Brink* describes how the Australian landscape got to be so hot, dry and flat.

“The fall in the Darling River system is only 5 centimetres a kilometre, so when the river was in its pristine state, the water probably took twelve months just to get from Longreach to Menindee. Today, the water does the same trip in about eight weeks. Why the difference? Because in olden times water in the Darling River diffused through successive floodplain steps. Today, the Darling is effectively a drain in which water flows unimpeded...

“Australia, Africa, South America and Antarctica were once part of a vast southern land mass we call Gondwanaland. Around 120 million years ago, Gondwanaland began to break up...and Australia began drifting north. The rivers that created Australia’s floodplains flowed from the mountains of Antarctica, rivers that were left behind when Australia with its flood plains broke away...So the floodplains that had always been fed by rivers suddenly had to survive on rain alone. Their response, through evolution, was to develop a water-management system different from any other on earth. The basis of it was that water had to be kept in the earth rather than on the surface.”

Isn’t it time we revisited how our natural landscape works best, instead of trying to manipulate it, motivated by vested interests and human hubris?

Peter Andrews is currently trying to convince the Australian Government of the need for an education program based on his natural sequence farming principles, and for workshops to make this information available to decision makers, farmers, teachers and trainers in the first instance, and then to schools and TAFEs throughout Australia.

Such an educational program is critical at this point in the climate change debate. Decisions are being made at regional and national levels with a sense of urgency, and often without the necessary shift in understanding of how the Australian natural landscape functions. That is a prerequisite for wise decisions about land and water resources management on this continent into the future.

STORY

Do you know that:

- *Water is the key to a deeper understanding of the spiritual component in landscape, in healing and in community well-being?*
- *The Great Artesian Basin in Australia, contrary to the popular view, is a fast diminishing, but little respected, finite resource?*
- *Water has not only a memory, but responds to emotions and is capable of organized thought?*

“Understanding the Role of Water in the Eco-system Water-Table”

(A new paradigm in thinking and understanding the workings of the Natural World)

Presented by Russell Reid Maule, Bathurst, New South Wales, August 29, 2008.

(used with permission)

Russell Maule has had an extensive international business and engineering career; he led a research team in developing a unique water purification system, assembled Australia's first Chinese joint-venture (with its Academy of Forestry in agro-forestry practices) and has been a close associate with Peter Andrews on land-management reform for the past 30 years. This life journey is now being applied to a deeper understanding of the spiritual component in landscape, in healing and in community well-being. He sees water as the key to entry into this deeper understanding.

Prologue

“Master of the Universe grant me the ability to be alone;
May it be my custom to go outdoors each day among the trees and grasses,
Among all growing things, to talk with the one to whom I belong.
May I express there everything in my heart, and
May all the foliage of the field, all grasses, trees and plants,
May they all awake at my coming,
To send the power of their life into the words of my prayer,
So that my prayer and speech are made whole,
Through the life and spirit of all growing things,
Which are made as one by their transcendent source.” (Reb Nachman of Bratslav)

Pope John Paul II insisted that respect for the integrity of creation is a moral issue and in a General Address on 17th January, 2001, the theme of ‘*ecological conversion*’ was introduced. He said:

“If one looks at the regions of the planet, one realizes immediately that humanity has disappointed the divine expectation. Above all in our time, humanity has unhesitatingly devastated wooded plains and valleys, polluted the waters, deformed the earth's habitats, made the air unbreathable, upset the hydro-geological and atmospheric systems, blighted green spaces, implementing uncontrolled forms of industrialization, humiliating – to use an image of Dante Alighieri – the earth, that flower bed that is our dwelling. It is necessary, therefore, to stimulate and sustain the “*ecological conversion*” which over these last decades had made humanity more sensitive when facing the catastrophe toward which it was moving.”

Pope Benedict XVI, in his earlier ecclesiastical and academic career, was destined to face many vexing and bitter conflicts arising from secular pressures in our emerging modern Western societies. Formulating the crucial linkage of *aggiornamento* (bringing up to-date) to *ressourcement* (a return to the sources), as a fundamental tenet upon which to address such issues, establish integrity and achieve sound outcomes, built for then Professor Ratzinger, the reputation and well-earned respect afforded by his church community.⁽¹⁾ It is indeed the only sound way to investigate a new issue which may arise within any dynamic organisational hierarchy, in government, business, the church, the arts, or in community. If there remains conflict, then clearly some adjustment is needed in either new observation or accepted source, in order to achieve integrity of the whole.

It is this approach that I have adopted here to respond to the subject heading with which I have been presented. It is an approach that has served me well over many years and many diverse projects. Brevity - and simplicity to the extent possible - helps achieve a necessary broad over-view, thereafter the bibliography will help deepen understanding where it is sought. (Note superscript references.)

“*Veritas visu et mora, falsa festinatione et incertis valescunt.*” (Tacitus. *Annals*, AD98)
(Truth is strengthened by observation and delay, falsehood by haste and uncertainty.)

What is an Eco-system?

An observed landscape is the exquisite end-product of a long evolutionary journey from the very beginnings of the Universe. What we observe around us is the global eco-system, which James Lovelock romantically named for the Goddess ‘*Gaia*’, as he saw it as a single, self-regulating, living entity of which the Human is an indivisible part. It is however, just the thin skin on the surface of a huge core of molten magma, which forms planet ‘Earth’.

Water that formed the oceans and is the origin and life-blood of the global eco-system derived from the cooling and expansion of that molten core, and that which still lies trapped in underground fissures from prior volcanic activity is the source of much of the underground bore-water which feeds global agriculture. This ‘*plutonian*’ water is an over-exploited, non-renewable resource that will shortly burst into global attention as these devastating facts are finally acknowledged. The Great Artesian Basin in Australia, contrary to the popular view, is one such fast diminishing, but little respected, finite resource. “The area of the ocean is increasing by 4.5 square km each year”⁽²⁾ as lava spews out of the great faultlines under the oceans and the continents move apart. Understanding of the role of water within the eco-system however, is largely a study of landscape *biology*, not landscape *geology*; it is a study of the functions and processes of a system governed by the laws of the Natural World.

The laws and disciplines of ‘*science*’ are a wholly human construct. Science has been very successful in advancing man’s skills, tools and exploitation of energy to perform work. Its methodology has achieved remarkable levels of accuracy, predictability, integrity and reproducibility. The laws and processes of science are however not the laws and processes of nature and, when the logic of ‘*scientific method*’ is used to interpret observations of the Natural World, it contradicts deeply-held beliefs of our indigenous past, and huge social conflict is the inevitable outcome.

Here we need to pay homage to Thomas Berry and many contemporary thinkers, whose wisdom and new insight into the workings of the Universe have derived from studies in both monastic and scientific disciplines.⁽³⁾ As David Suzuki might tell us, we appear to have travelled full circle back to the intuitive ‘Wisdom of the Elders’ and, if you wish, to the great readers of the Australian landscape, such as Peter Andrews, and its original indigenous inhabitants.⁽¹²⁾ For it appears that entry into these new frontiers of knowledge and deeper understanding, is best made through the doorway of spirituality and faith, rather than by way of a wholly rational education and the materialistic paradigm of science, which diminishes our perception of reality.

Our senses tell us that the universe is made up of countless bits of solid matter in a vast emptiness, but neither view is correct. Matter is a violent bundle of energy consisting almost wholly of ‘*space*’, which ‘winks in an out’ as a particle, according to what is encountered, and space is an interconnected medium alive with energy, intimacy and potential – it is the ‘*ether*’ of Einstein, ‘*the divine matrix*’ of Max Planck (the father of quantum theory) through which all light and information travels.⁽⁷⁾ Our bodies and all life on Earth is connected to this unseen and little understood life field.

With the discovery of laser light, we now have *the hologram*, a three dimensional image where every piece contains the image of the whole. It is believed the universe is a hologram where the tiniest atom reflects the image of the galaxies and a change in one piece reflects throughout the whole – instantaneously. Mathematicians talk of a four dimensional hologram, where time is the fourth dimension.⁽⁸⁾ These fundamental units of matter, ‘*protons*’ and ‘*electrons*’ (and the *hydrogen* atom), store information, within almost limitless storage capacities, going back to the time of their formation one million years after the ‘*great flaring forth*’, 13.7 billion years ago. Our on-off, *binary* digital computers are being superseded by quantum computers of *entangled particles* or EPR pairs (Einstein, Podolsky & Rosen) with seemingly unlimited capacity.⁽⁸⁾ The brain’s *tubulin proteins* take at least two (binary) shapes.

Current remarkable research by Japan's Masaru Emoto⁽⁹⁾ has demonstrated that water has not only a memory, but responds to emotions and is capable of organised thought. Suddenly the testimony of the early mystics and teachers has meaning and deeper understanding and Rhonda Byrne's extraordinary international bestseller, *The Secret*, suggests the human capacity to tune into this unlimited data bank.⁽¹⁰⁾ The importance of the structure and nature of water is fundamental to Rudolf Steiner's *Bio-dynamic Farming* practices, which boast both ecological sustainability and huge health benefit derived from its produce.⁽¹¹⁾

It is the water in our cells that carries the genetic information and organises the construction of cell DNA, and so it is with all life in the global eco-system. It is the water within our cells that responds to the emotion of joy, compassion and gratitude which heals (and so it is that these healthy or damaged cells pass from generation to generation).⁽⁹⁾ It is the stored genetic memory that enables the monarch butterfly to complete its migratory journey through several generations and a great forest oak to grow from a tiny acorn.

As James Lovelock points out (*The Revenge of Gaia*, 2006), it is water that created life with the carbon atom by harnessing energy from the sun (photosynthesis), and it is water that now protects all life that it has created (including the great water climate-cycles that cool the Earth from the ever-increasing temperature of the Sun). Water retained in the landscape feeds plant-transpiration water-systems which cool the forests by day (and evaporation cools the ocean surface); at night condensing dew, and perhaps frost, insulates and warms all forest life. Tiny plant bacteria rising with the water vapour seed the clouds and draw in the storms. Ice at the poles protects all life in the sea. Water has unique properties possessed by no other substance.

Synergistic and symbiotic, interdependent relationships feature in many universal processes, as in the mutual dependence of plants and soil biota.⁽⁵⁾ In a restless drive for balance, partial-pressures power osmotic systems by which water enters plants and cool vapour is whisked off lakes and oceans to form clouds and deliver rain.

Professors Berry and Swimme⁽⁵⁾ liken the process by which nature controls increasing diversity and adaptation to its surrounding environment, to 'homeostasis', a word derived for the same mechanism which controls the protein level in human blood. It is a system that constantly fluctuates between two feed-back systems; any mutation that improves sustainability survives and prospers, that which fails is extinguished. When a molecule or elemental substance meets a changed environment it alters form so as to counteract that change – Le Chatelier's Law. The eco-system is not a steady state, it is part of a restless evolving Universe; water and all life is on the move and that movement is fundamental to its health.⁽⁹⁾

Thomas Berry writes: "*The human venture depends absolutely on this quality of awe and reverence and joy in the Earth and all that lives and grows upon the Earth. As we isolate ourselves from these currents of life... our basic life-expectations are diminished.*"

What is a Watertable?

Here we should defer to Peter Andrews, that quite remarkable Australian farmer and naturalist, who has devoted his life to observing the landscape and to finding practical solutions to its preservation, by adopting sustainable farming practices.⁽¹²⁾ Andrews' colleague, Professor Jan Pokorný (Czech Republic), has published⁽¹⁴⁾ a comprehensive exposé on the pivotal role of retained soil-moisture in determining regional climate.

In his first ABC publication *Back from the Brink*, Andrews tells us that when Australia broke away from Antarctica perhaps 50 million years ago its floodplains became separated from the mountain ranges which fed its rivers, and the landscape and all its plants and animals had to slowly adapt to a new set of climatic conditions. What evolved proved remarkably resourceful - and unique. Rivers had become a series of ponds charging and maintaining underground water-tables. Today, by our intervention they are eroded gullies draining the landscape and parching its life-forms.

"*The key to survival of vegetation in Australia is the storage of water in the ground.*" Water enters the ground in recharge areas [sandy patches in grasslands, free from clay]; it seeps into surrounding layers of clay and is stored there for use by the plants during the dry spells that inevitably follow. Clay stores the minerals that plants need.

"The stream beds were sealed by clay so very little water got through there. On the other side of the streams however, there was a network of secondary flow paths extending right across the floodplain

along which water would travel at times of flood. The sand in the floodplains filled up with water and trickle-fed the country lower down the system; the further down the floodplain, the more continuous the supply of water. If it rained when the ground was already full of water, surplus water would run over the surface.”

Andrews reproduces *Water Dreaming* by artist Tim Leura Tjapaltjarri and comments upon the accuracy of aboriginal art in representing “an ancient floodplain system, complete with separate steps, ponds, wetlands and watercourses.”

In his second publication, *Beyond the Brink*,⁽¹³⁾ for release in November this year, Andrews continues his observations about the key role played by these water-tables.

“The absolute fundamentals of landscape function are, one, the green surface area...two, the movement of water in the ground...and three, the extent to which the water vapour that plants transpire during the day is recovered at night as dew.”

“We need forest strips, wildlife corridors, wide hedgerows...they must be established relative to the landscape hydrology...plantations of trees and other kinds of course vegetation must be established on the higher points of the landscape, so that the ground water can distribute the fertility generated there throughout the land below. Take out the trees on the high ground and you will loose fertility whatever else you do.” (See the 2,400 years old, Chinese ‘*Guoyu*’.)

Clay moves with water and settles where it pauses, it holds huge volumes of water, then, swelling by up to a third of its volume, it folds and moulds the land-form. Andrews introduces ‘allelopathy’ (chemicals released by a plant to inhibit similar species growing nearby), also the nature of water-pressure which determines which plants will grow where, all controlled by the movement of underground water.

“A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it does otherwise.” Aldo Leopold.

Understanding the Role of Water

If we see water as *H₂O*, as science teaches us, we miss the point. The original Greek meaning of ‘sin’ is to miss the point. If we see water as ‘*living water*’, the source of all life within the global eco-system, the bearer of its genetic history and the code by which it will continue and flourish, the very essence of life itself, we come close to understanding the role of water and its magical hydrogen atom in all that is, all that has ever been since the beginning of time, and all that is yet to come.

Without water there is chemistry, add water and there is life.

Thomas Berry sees planet earth entering the next geological period, the *Ecozoic Age*, when if we are not to see the next mass extinction period in its history, the human species (which has now overcome all natural constraints imposed by nature) must harness its emerging self-awareness to impose self-restraint and discipline to work in harmony with the laws of nature and to protect and enhance all life within the global eco-system. Clearly the only place to start this process is with a proper understanding of the role and nature of water and its relationship with all life.

An appreciation of the fundamental role of water in all decision-making must extend beyond the management of the forest estates and agriculture, to the placement of our settlements and infrastructure, to the design of engineering structures, to collection, distribution and disposal of water and food, and to how we choose to live with each other and with all living creatures in a healthy and vibrant landscape.

Regional climate is influenced by disturbance of the great water-cycles dominating weather. Cities become heat-islands and barren agricultural fields, virtual deserts. All planning must start with a detailed knowledge of the underground watertable and the patterns of water movement. Landscape plans can precede proposals as to how we might live harmoniously within the landform and enhance its function. The built environment can then rise from the landscape, relate to it, and have inbuilt, the green structures and energy efficiencies, which reduce its environmental impact.

Water, water sources, and places where water flowed underground, were known to our ancient ancestors and were held sacred.⁽⁹⁾ *Water is sacred*, and its role in nature has deep spiritual significance. To believe that by

purifying sewerage and making it chemically sterile, is making it fit for life support is to ignore our deep spiritual morés and be ignorant of our evolving awareness of the truth in these old indigenous values. A new community value base must confront politicians and their misguided advisors.

Abuse of water is a blasphemy against all life and creation; ignorance is a sin.

Epilogue

The Christian Church speaks of God, the Creator, in all things as the Holy Ghost. Adelaide theologian, Denis Edwards tells us: ⁽¹⁶⁾ “The Greek word *perichoresis* is something like that of an encircling embrace. It suggests being present in one another in radical intimacy – a mutual presence in love. Perichoresis points to unity in diversity; it refers to a communion in which diversity and unity are not opposed, but enable each other to exist. Our interrelated universe, with all its diverse creatures, emerges from the embrace of the divine communion in love. This gives unthinkable depth to the importance of ecological interrelationships.” Elizabeth Johnson writes ⁽¹⁷⁾

“The Trinity is a pure relationality, which epitomizes the connectedness of all that exists in the universe”.

Johnson also wrote: ⁽¹⁸⁾

“Woven into our lives is the very fire from the stars and the genes from the sea creatures, and everyone, utterly everyone, is kin in the radiant tapestry of being.”

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Epilogue

'*Ecological Conversion*'. (The teachings of Pope John Paul II).

'The Crucial Linkage of *aggiornamento* to *ressourcement*'. (Pope Benedict XVI)

'*Perichoresis*', the 'Trinity', the 'Holy Ghost' and the Confluence of East & West.

(Denis Edwards -*Ecology at the Heart of Faith*)

Protecting the Role of Water in the Ecosystem Water-table.

Community leading change, a major mind-shift, a new paradigm, a 'New Earth'.(Eckhart Tölle)

REFLECTION

Setting the Space: In the sacred space a large jug of fresh water, a glass bowl is placed with a lit candle. Gather in a circle. Each person present has a glass.

Leader: We are gathered on holy ground, where we are sitting is holy, this is holy ground and we are holy. We bless this jug of water, as we remember the wonderful story of long ago, when Your Spirit hovered on the waters and gave meaning to the chaos, and life to all creatures of this earth. May this water nourish our appreciation of life flowing within us and call us to deep stillness and peace.

All: May this water nourish our appreciation of life flowing within us and call us to deep stillness and peace.

The leader then pours some water into the glass of the person sitting next to her and then invites each one to pour water into the glasses for each other until all are filled.

Each person in turn reads three phrases, pauses and everyone savours a sip of water.

Water is the raw material of creation, the source of life...

When the waters break, the child is born from them...

Water is at the heart of human ritual... *savour a sip*

Baptism often welcomes the child into the human family...

The powerful symbolism of water as transformation, purification, sharing permeates our lives...

Water flows through our memories... *savour a sip*

Pulled three ways, by earth, the moon and the sun, the tides wax and wane day by day, month by month, season by season, beating out the dance of the planet, satellite and star...

Our lives are made possible by the hydrologic cycle...

The miraculous process whereby salty water is transformed into fresh water by evaporation and is redistributed around the planet... *savour a sip*

After millions of years, fresh water covered most of the earth...

Like air, water is essential to our survival...

The average human being is roughly 60% water by weight, nearly 40 litres of it carried in trillions of cells... *savour a sip*

Water seeps through our skin, escapes from our lungs as vapour and exits every opening of the body...

Human beings have an absolute need for fresh water...

Water defies human boundaries and human ownership... *savour a sip*

Together with the sun, the oceans drive the planet's climate...

Water is the tide of life itself, the sacred source...

As air is a sacred gas, so is water a sacred liquid that links us to all the oceans of the world and ties us back in time to the very birthplace of life... *savour a sip*

Woven into our lives is the very fire from the stars and the genes from the sea creatures, and everyone, utterly everyone, is kin in the radiant tapestry of being.

Elizabeth Johnson

I am Living Water...John 4

Everyone who thirsts come...Isaiah 55...*savour a sip*

Readings

- When the poor and needy seek water, I will open rivers on the bare heights, and fountains in the midst of the valleys; I will make the wilderness a pool of water, and the dry land springs of water. Isaiah 41:17-18
- ***By the Murray River, we cry for the dying lakes***
We lament.
- ***By the deserts and dry lands, we cry for those thirsty and suffering***
We lament.
- ***By the polluted water streams choking for life, we cry.***
We lament.

Sing together: By the waters of Babylon there we sat when we remembered Zion...

The water left over from the meditation is ceremonially poured into a glass bowl. Each person comes forward and dips hands into the bowl and then rubs the water into the skin.

The candle is blown out and the ritual concludes.

ACTION

- Take steps to become informed of the issues around water, both locally and globally.
- Read Peter Andrew's book *Back from the Brink* (2006) and *Beyond the Brink* (forthcoming, November 2008). You may find avenues to support his proposal for an education program based on his natural sequence farming principles.
- Explore ways to honour the significance of water for all forms of life. Handle it with care and invite others to do likewise.
- In the light of the process above, what response might you make to those who exploit diminishing underground resources?
- Draw on this resource, especially the reflection, during International Water Week (beginning October 13).

From: Specific Issues Committee, Eco-Justice (Sisters Margaret Abbott, Mary Dennett, Kate McGrath and Patricia Powell)
The Committee warmly invites your response to the article or the issue.

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