

WHAT Talk on Sunday 12th February 2023

The Patient & Emotional Ape

By Andrea Andrews

A Drowning Prevention & Learn-To-Swim Researcher



EXPLORING
THE WATERSIDE APE HYPOTHESES:
WHAT CAN WE GLEAN FROM 'HUMAN AQUATICS'?

1. The psychophysiology of humans engaging safely with water has deep evolutionary roots.
2. There is so much information inside human aquatics we could call this 'opening the door into a parallel world'.
3. Hopefully opening the door will encourage more Curious Aquatic Professionals to start sharing their Aquatic Intelligence.

HUMAN AQUATICS IS: LEARNING ABOUT NATURAL HUMAN BEHAVIOUR IN WATER

1. Exploring natural forms of aquatic support structure & identifying distractions in the human waterscape.
2. Indigenous expertise (Natural progressions from purposeful or survival usage of the environment)
3. Adult L-T-S & Mother & baby learning duopolies (Complex innate attunement processes unfold self-agency)
4. Emotional experiential training to learn how to learn with aquatic wisdom (Physical intelligence & self-regulation)
5. Disabilities rewiring & powerful adaptations (Adaptive inter-animation, Nelms Method & balance in stillness)
6. Autism & learning self-regulation (Lack of Social Engagement System & labelling of interoceptive qualia, Nelms M.)
7. Using the valuable embodiment insight of Curious Aquatic Professionals (Effective information is used & shared)
8. The valuable embodiment insight of elite performance coaches (Key information may be hoarded or gets lost, NM)
9. Critical L-T-S & Lifeguarding expertise (What pre drowning & drowning looks like, research for public water safety)
10. Barriers to safe human learning in water (Inappropriate competition, intellectual distraction, organisational fear)
11. Innate forms of risk management, teens & wisdom (Fast & slow thinking, Fourfold prospect theory & Saliency)
12. Using quiet swims to escape social pressures or doing hard swims for emotional & physical fitness challenges
13. Exploring the waterside ape hypotheses using multiple avenues of research & contributing to discussions about it.

Something intriguing happens to humans and other mammals when they get into the water. How & why do they change?



FIRSTLY AN OVER VIEW OF HUMAN AQUATICS

1. Modern humans are often dangerously disconnected from nature & waterscapes.
2. The human body plan & its maturation pathways do hold innate aquatic potential.
3. Attuned human cultures employ innate aquatic potential to thrive in waterscapes.
4. The Public Water Safety Educators & Science are rightly occupied by a fear of 1.
 5. There is a new interest in understanding 2&3 in order to change 1.
 6. The present holds some hidden keys to the deep past.
 7. All humans need aquatic priming.
 8. Water entrains.

HOW DOES WATER ENTRAIN US?

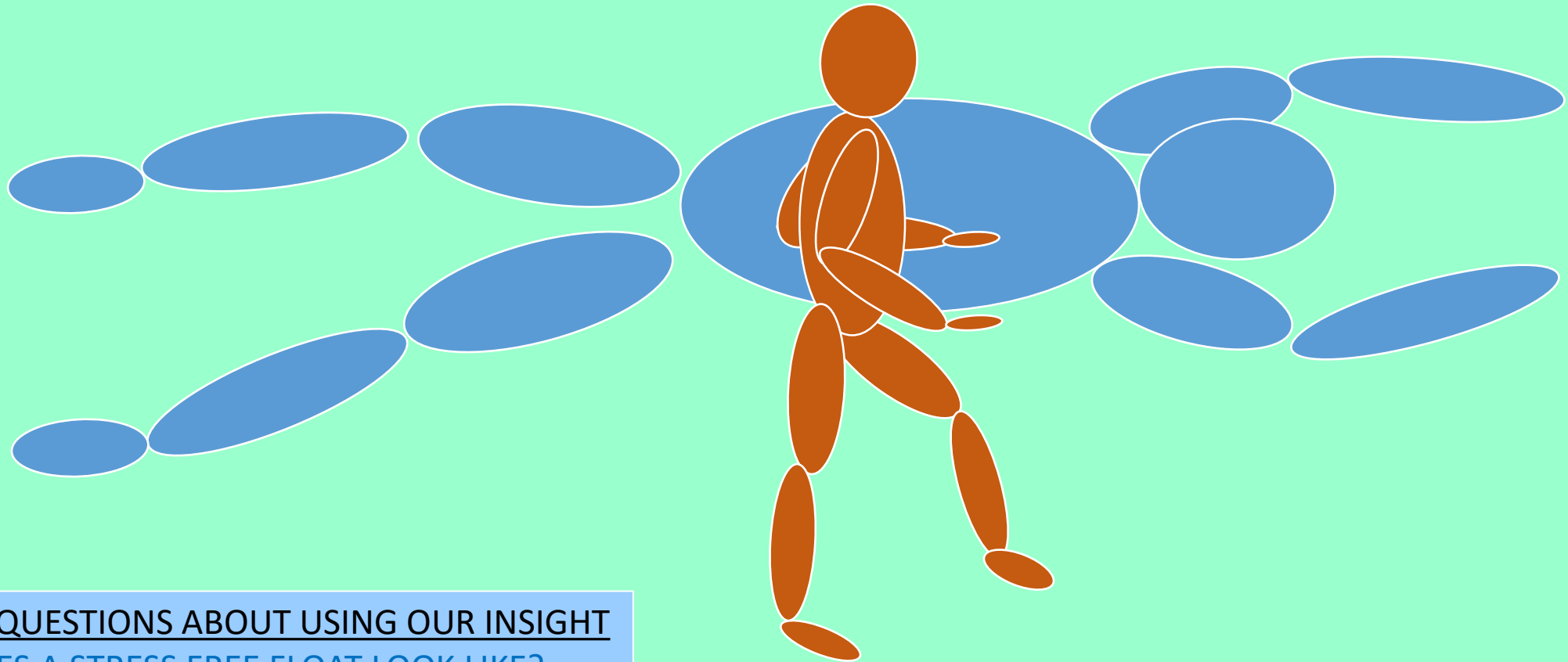
- 1 . Water entrains us within through **INTER ANIMATION**. (A Loop of Wise Aquatic Time Entraining Regulation)
2. Inter animation in water improves the calibration, stability & adaptability (wisdom) of our internal state.
3. By accepting how to learn anew, we clear confusion, use safe mistakes and self-regulate inside the water.
4. Embodied experiences of all the steps towards self-regulation in water allows us to read others closely.
5. Aquatic patience emerges from responding to water at the correct pace in order to survive & thrive.
- 6 & 7. Evolutionary ratchetting occurred by engaging more deeply with the W.A.T.E.R. for long enough?
- 7 & 6. Speech has advanced our technological prowess but can disconnect us from W.A.T.E.R's insight.

INTER ANIMATION DRIVES DEEP EXPERIENTIAL LEARNING ABOUT HOW WATER WORKS

1. Water responds to physical bodies and movements in generally predictable but not specifically predictable ways because one slight change will alter the physical outcome; generating a suite of new possibilities.
2. The learner needs to sense, adapt & adjust constantly which activates deep instinctive processes in the body.
3. Everyone has a 'signature' in which the physics holds them at rest and provides a calm strong feeling of 'home'.
4. Forces alter if the body moves but physics on the body always has a 'home' which still feels the same even when the body is in a new shape or the location of the 'signature' is moved by the water. 'Home signature' has an 'aquatic shadow'.
5. When physics on the body move off the 'home feeling' then there is stimulation, often accompanied by a little anxiety because the water wants the body to go back to 'home'.
6. The water transmits strong feelings of pressure that change with the speed & size of movements. The feelings have rhythm because the changes have a rhythm. A large movement can cue attention on the characteristics of water rhythms.

Ref: The Nelms Metod from Milton Nelms at the World Aquatic Development Conference, in Lund, Sweden, 2023
Based upon work at Gillavatten & The Shayne Gould Swimming Project to prevent drowning in Fiji, South Pacific.

THE ANCIENT & SCIENTIFIC ART OF FLOATING



IMPORTANT QUESTIONS ABOUT USING OUR INSIGHT

Q: WHAT DOES A STRESS FREE FLOAT LOOK LIKE?

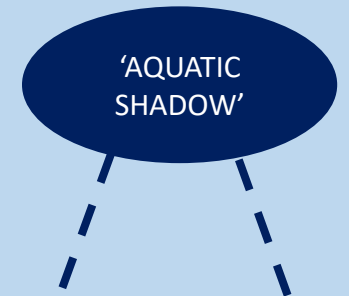
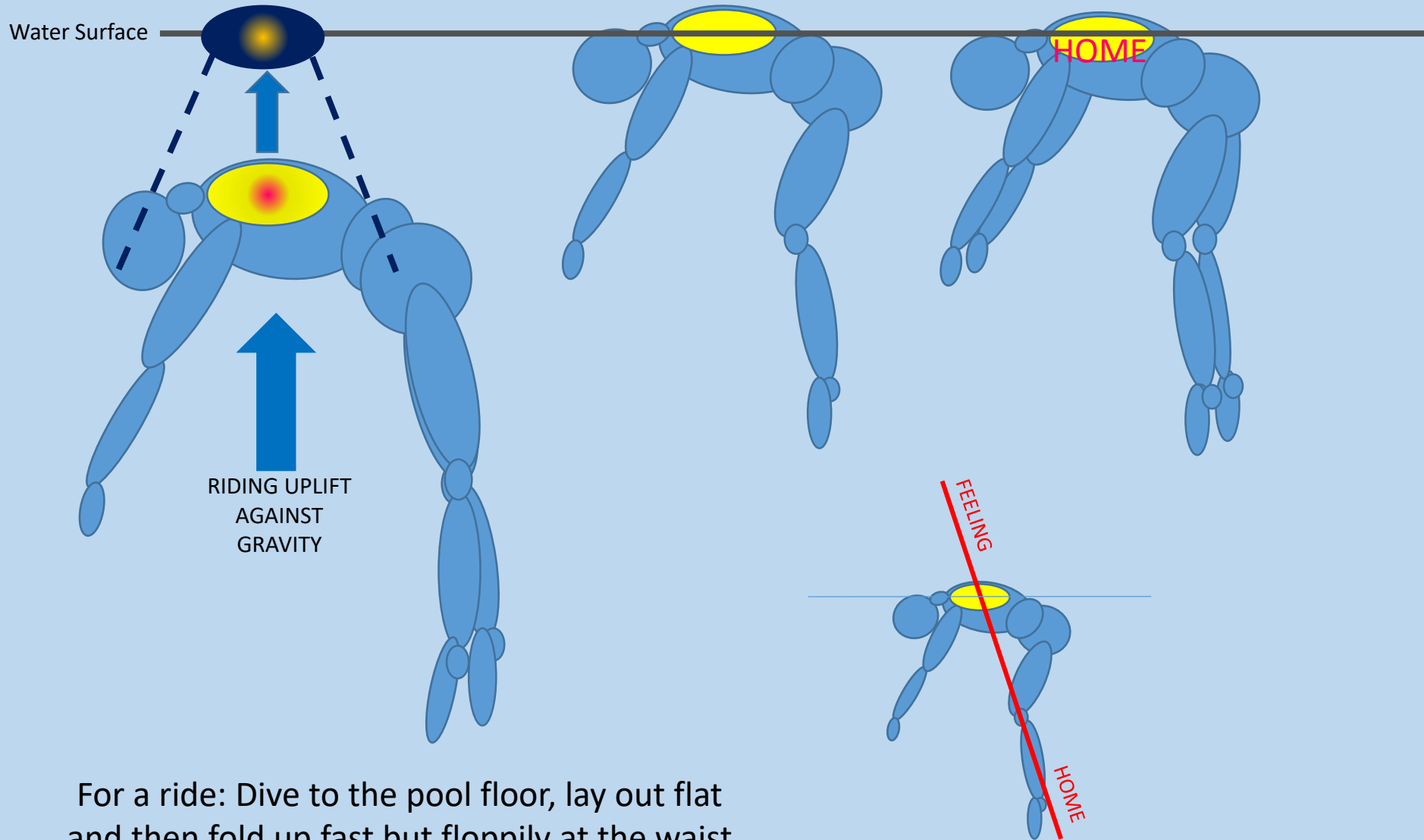
Q: **OR A SURPRISE STEP OFF INTO DEEP WATER?**

Q: HOW DO WE KNOW?

Q: WHAT DOES THIS TELL US?

HOME SIGNATURE FLOATING

NB: This work is based upon seeing the NELMS METHOD At WADC 2023.

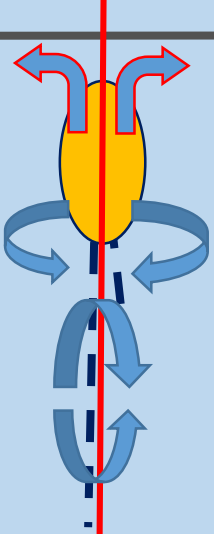


The 'Aquatic Shadow' helps people understand why their feelings change in the water, especially when they move away from their home signature.

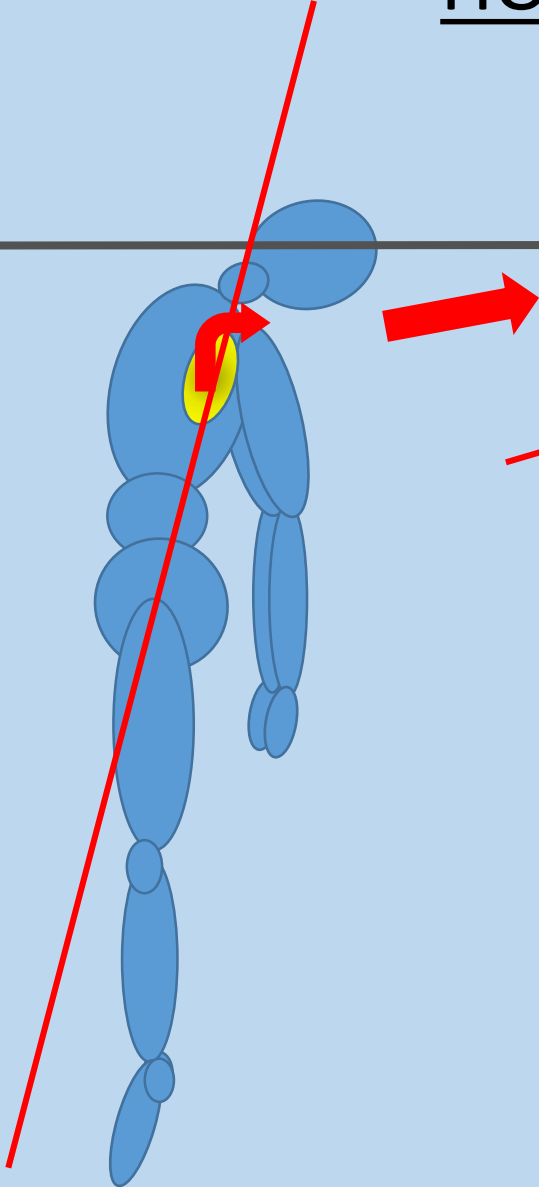
For a ride: Dive to the pool floor, lay out flat and then fold up fast but floppily at the waist to offer the water more surface area to push on.

HOME SIGNATURE FLOATING

IN VERTICAL FLOATING THE BODY'S CENTRE OF BUOYANCY IS USUALLY BELOW THE SURFACE & IS UNSTABLE

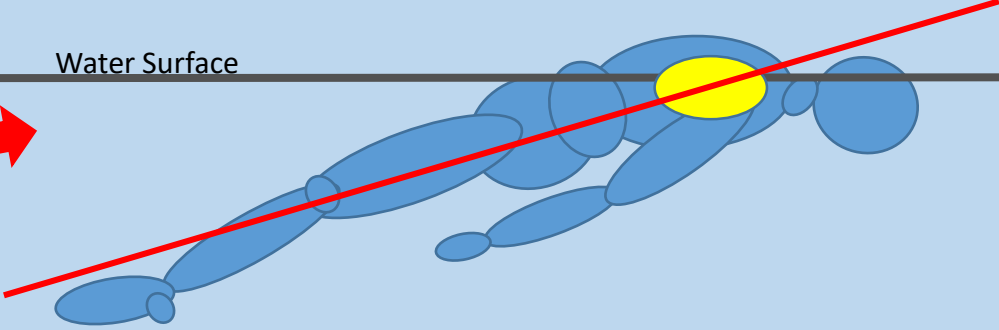


POSTURALLY BALANCING on the top of a small point



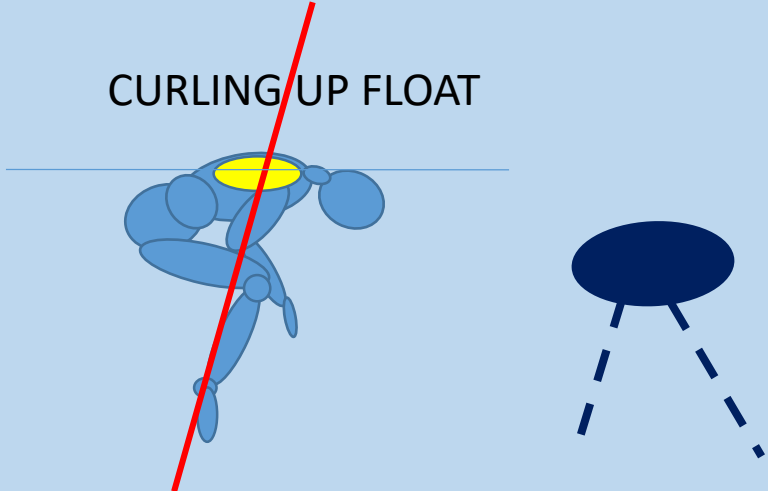
Water Surface

HOME BACK FLOAT



'SUPINE AQUATIC SHADOW'

CURLING UP FLOAT

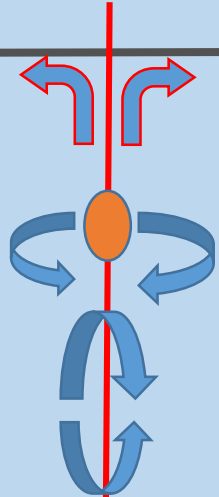
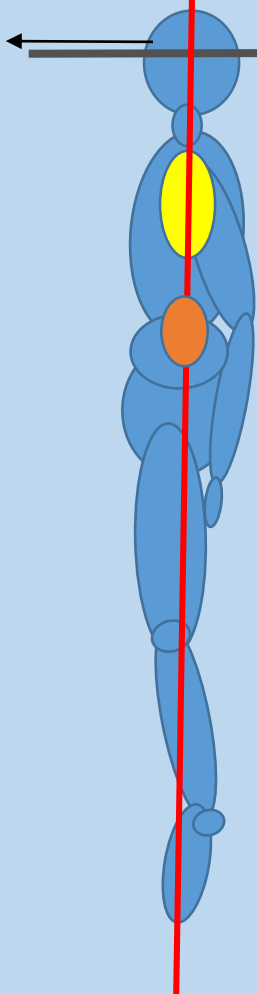


The red line of comfort & the 'Aquatic Shadow' change location in the water with stationary inhales and exhales and in response to whether the body is vertically or horizontally aligned with gravity

NB: This work has been deeply inspired by physical embodiment & trainings with M. Dash & the NELMS METOD WADC 2023

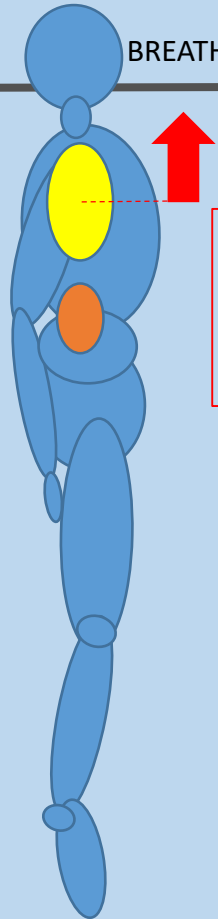
VERTICAL SIGNATURE FLOATING

STATIONARY
VERTICAL
FLOAT



IN VERTICAL FLOATING
THE BODY'S AQUATIC
HOME SHADOW IS OFTEN BELOW
THE SURFACE & REQUIRES
AN ACTIVE SENSE OF POSTURAL
BALANCE TO BE MAINTAINED
IN AN UPRIGHT POSITION.
IT ALSO RISES & FALLS
WITH BREATH VOLUME

BREATH IN



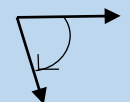
Facial Features
Often Go IN
& OUT
of The Water

BREATH OUT



WHERE THE EYES ARE
LOOKING DETERMINES
WHETHER THE FLOAT REMAINS
BALANCED UPRIGHT
OR NOT

LOOKING DOWN
LEADS TO ROTATION INTO A
HOME FRONT FLOAT



LOOKING UPWARDS
LEADS TO A
BACKWARD
HEAD TILT
WHICH
LIFTS
THE BODY INTO A
HOME BACK FLOAT

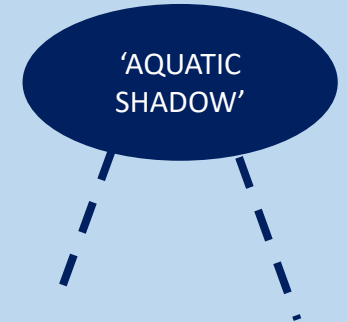


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METHOD WADC 2023

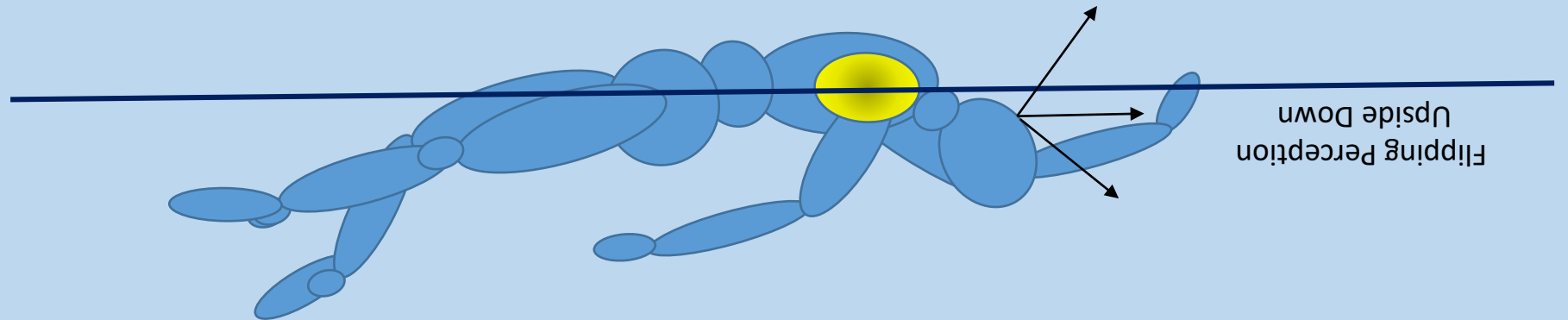
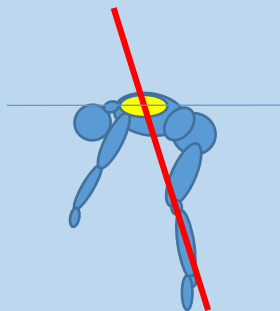
HOME SIGNATURE FLOATING

Milton Nelms worked with Bill Boomer Researching & coaching elite swimmers

1. Bill Boomer had to adapt on land after a childhood accident & he became an expert basketball player which gave him great **INSIGHT** for elite aquatic coaching. His legacy is the powerful concept of inter animation & the current surge in interest in Aquatics using experiential learning.
2. Milton Nelms first **ILLUSTRATED** Bill's insights with rapidly sketched figures similar to these.
3. The body parts are represented with shapes. Physical forces, **feelings** or movement tracks are represented with lines, arrows and a symbol of the centre of buoyancy (**HOME**)
4. When we have experienced these sensations in the water we can intrinsically read these images. My illustrations were more basic & developed from seeing an art installation & asking my daughter to illustrate what floating felt like to her. Next I illustrated someone accidentally stepping off into deep water & another in a fully relaxed back float. All along I was trying to share a visual sense of what was constantly being overlooked in Human Aquatics; the powerful hidden phenomena of inter animation.

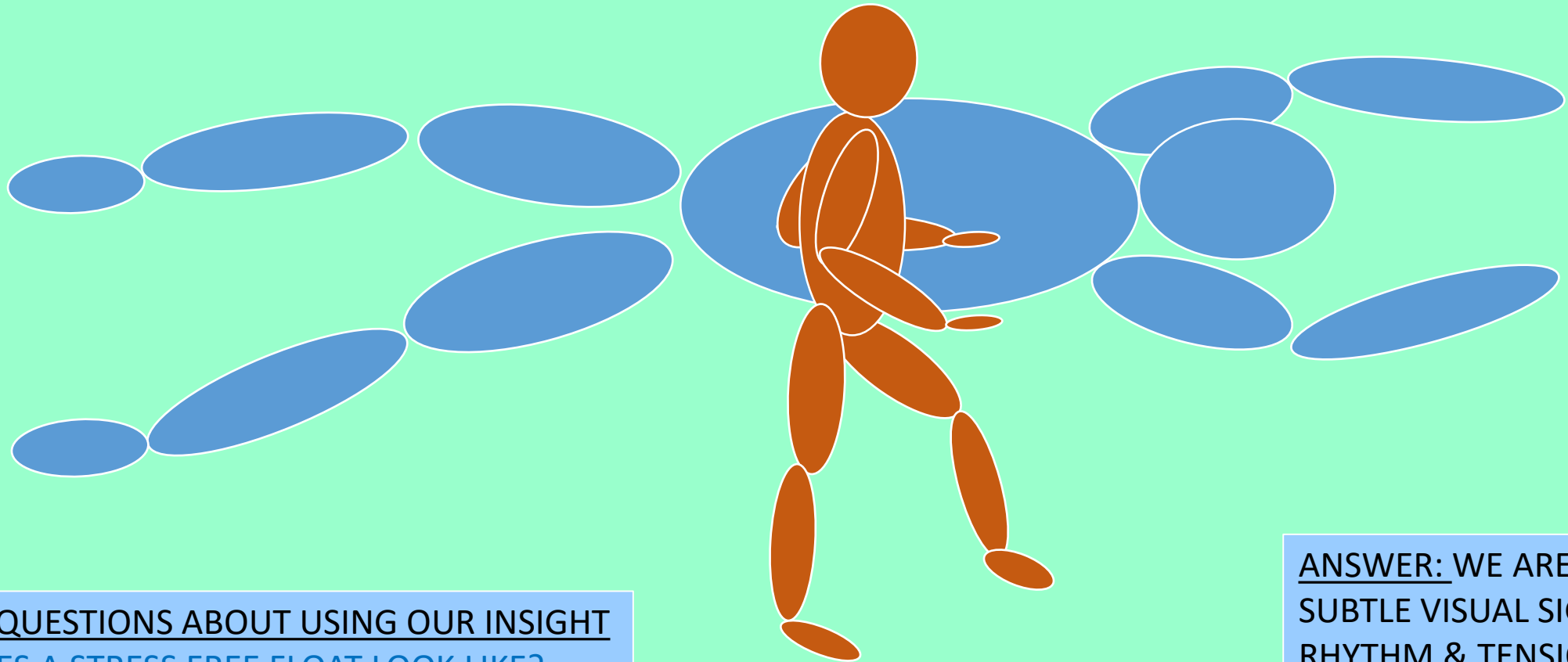


The 'Aquatic Shadow' helps people understand why their feelings change in the water, especially when they move away from their home signature.



Flipping Perception
Upside Down

THE ANCIENT & SCIENTIFIC ART OF FLOATING



IMPORTANT QUESTIONS ABOUT USING OUR INSIGHT

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Q: **OR A SURPRISE STEP OFF INTO DEEP WATER?**

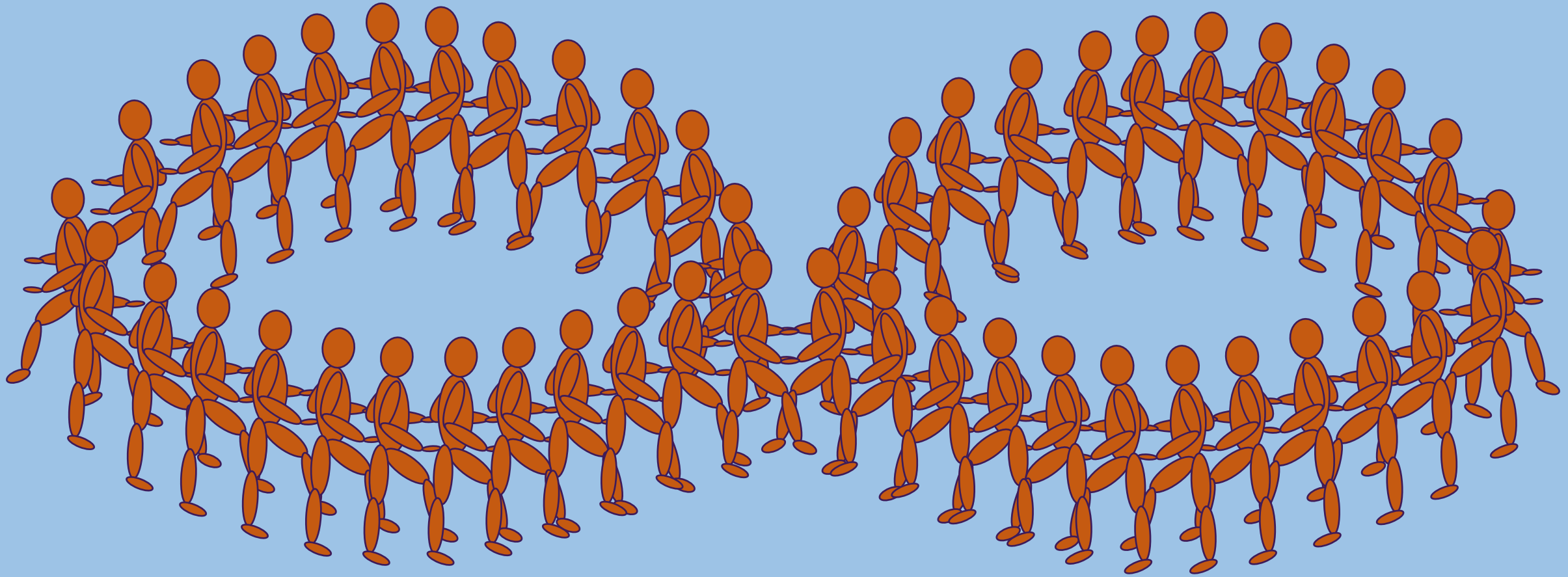
Q: HOW DO WE KNOW?

Q: WHAT DOES THIS TELL US?

ANSWER: WE ARE READING
SUBTLE VISUAL SIGNS OF
RHYTHM & TENSION BOTH
IN THE BODY & HAPPENING
IN THE WATER AROUND IT.
I N T U I T I V E L Y

THE AQUATIC LEARNING LOOP

Water is a perpetual playmate



A Loop of WATER: W_{ise} A_{quatic} T_{ime} E_{ntraining} R_{egulation}

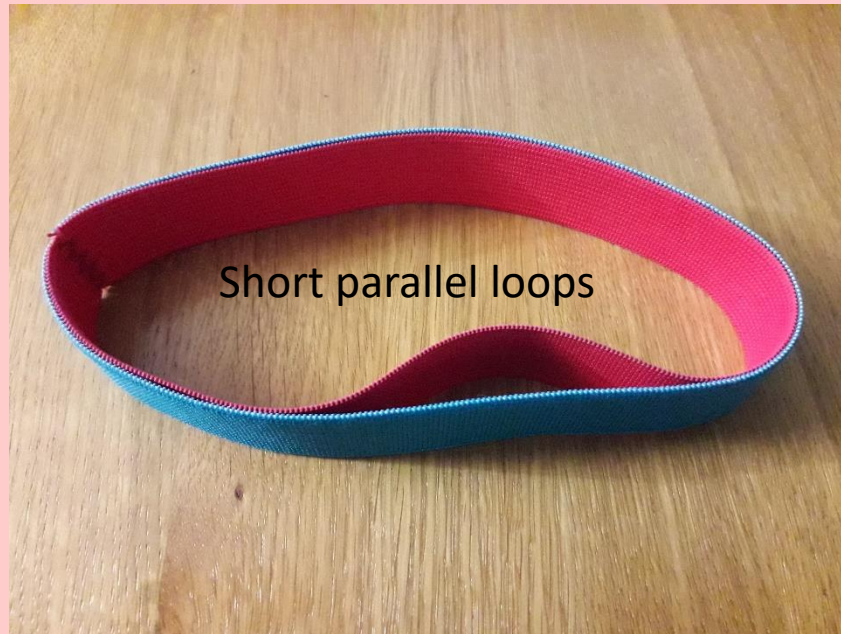
HARNESSING OUR AQUATIC LEARNING MACHINERY

The Dorsal Vagus Nerve drives Freeze, Fight & Flight in vertebrates & the Ventral Vagus Nerve is critical to social mammals.

When our emotions are well regulated the DVN & VVN start working in tandem like the single surface of a Mobius strip.

We start to gain more reflective access to the subconscious parts of the peripheral & central nervous system when we have been comfortable in water for long enough to build trust in our SELF inside the environment. Intuitive insights start to drift into our consciousness and we become more resilient because we are accessing most of our visceral nervous system.

STATIC FEAR



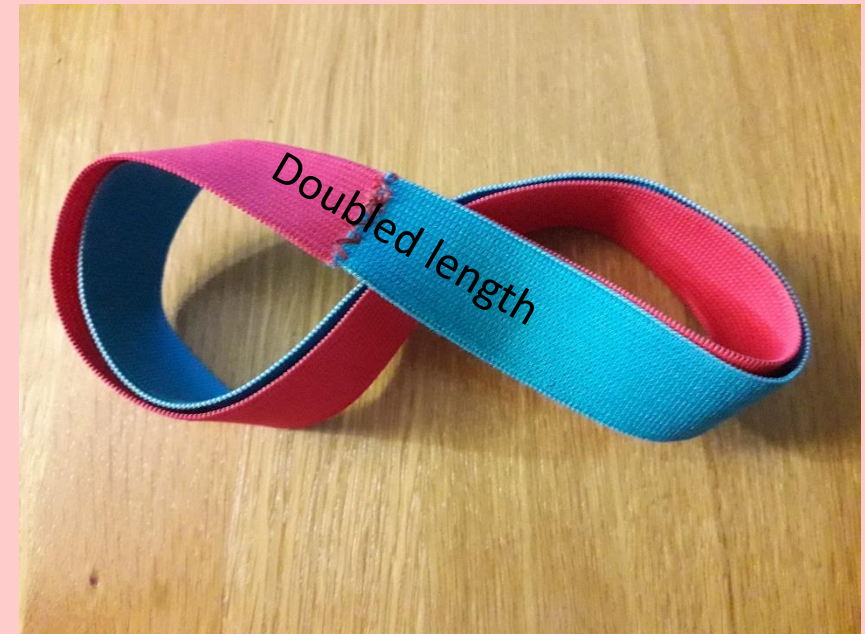
UNABLE TO GAIN INTUITIVE INPUT

Lateral Nerve Stimulation

Increased
Usage of
SENSORY
FLOW
X
OWN
INTUITIVE
INNERVATION
Pathway

Lateral Nerve Inhibition

DYNAMIC RESPECT



ABLE TO GAIN INTUITIVE INPUT

THE HYPOTHETICAL IMPACTS OF OUR ANCESTORS ENGAGING WITH WATER

STEP 1a **TERRESTRIAL MODE**

STEP 1b **AQUATIC MODE**

STEP 2 **LOOKING INSIDE**

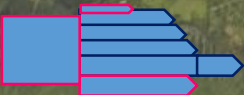
STEP 3 **SHARING AQUATIC EMBODIMENT**

STEP 4 **GROWING AQUATIC INSIGHT**

STEP 5 **SELF-AGENCY & DEEP AQUATIC PATIENCE**

STEP 6 **RATCHETTING**

STEP 7 **VISIO-CULTURAL VULNERABILITY & INNATE AQUATIC POTENTIAL**



1. TWO RESPONSES TO WATER'S APPEAL – DRIVEN BY DIFFERENT SENSING MODES & UNDERLYING MOTIVES

1a. Water invites vulnerable novices to use **land habituated gaits** to rapidly cross, & nervously dip into its stimulating environment. During this **superficial engagement** with the water environment they remain strongly attached to external places of safety & the water surface for constant air. Unfortunately **panic** can lead to the **Instinctive Drowning Response (I.D.R.)** taking over if the depth of the water reaches over their mouth height. Panic can occur in any depth of water and a person can drown in just inches of water if they freeze with fear.

(USING **THE TERRESTRIAL MODE** OF LAND HABITUATED MOVEMENT PATTERNS)

1b. Water's **entrainment properties** encourages some opportunistic novices to start **priming themselves** with some **deeper engagement** by testing sensations **through inter animation** in shallow or supportive water spaces so that they gradually begin to feel more prepared for exploring water more deeply. They will still be vulnerable until they have dispensed with the affect of **thigmotaxis**, learned how to get air & become fully independent in over head depths.

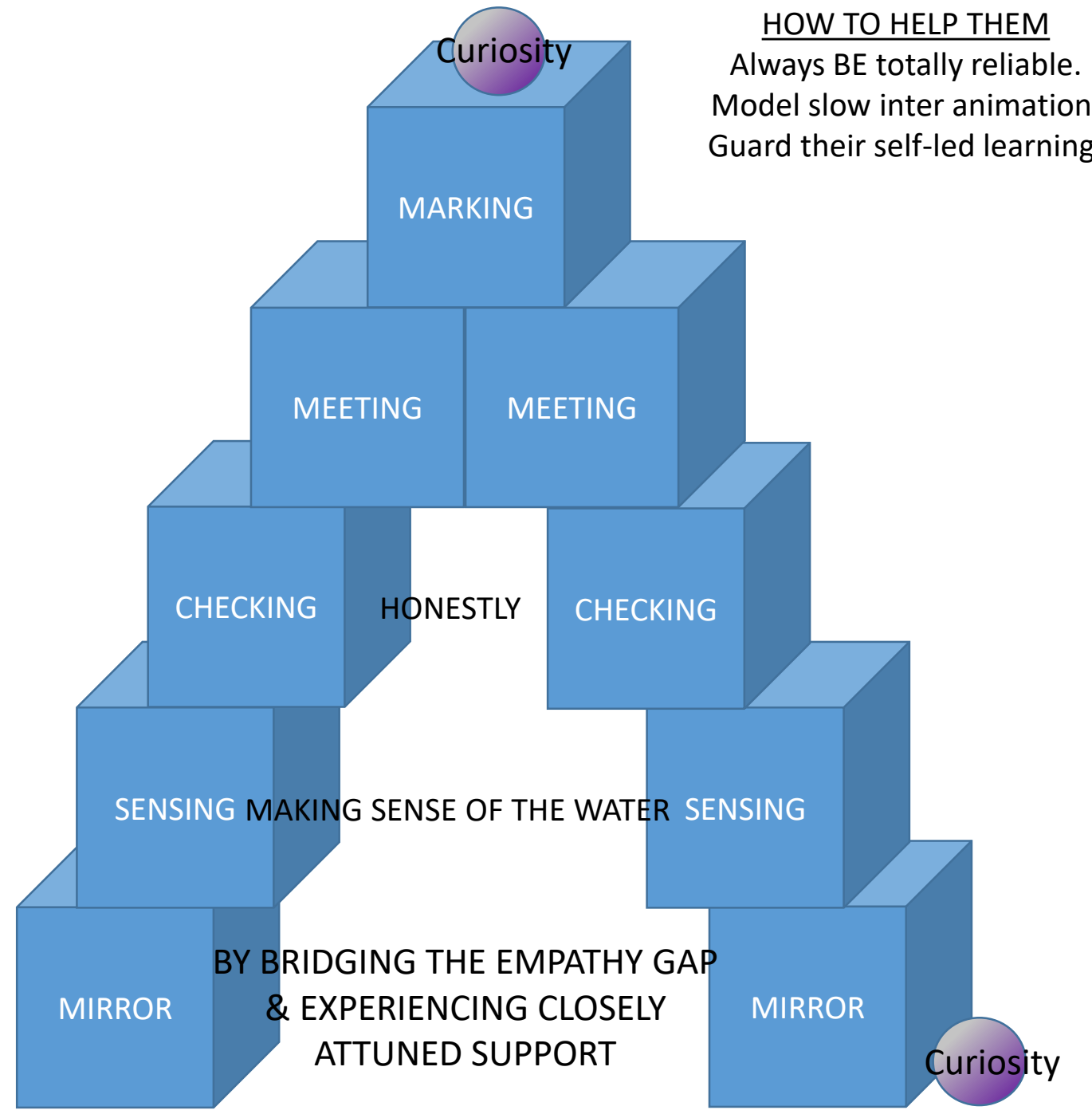
(USING **THE DEEPER AQUATIC MODE** TO START ENGAGING WITH THE WATER)

1a

HOW SOME PEOPLE CAN FEEL IN TERRESTRIAL MODE



HOW TO HELP THEM
 Always BE totally reliable.
 Model slow inter animation.
 Guard their self-led learning.



What does pre-drowning & drowning look like?

1. Frank Pia coined the term and described the common characteristics of the Instinctive Drowning Response. [Pia, F. \(1974\), Observations on the drowning of non-swimmers. Journal of Physical Education. 164-167, 181](#)
2. Mario Vittone on his website mariovittone.com illustrates with a typical story how “Drowning doesn’t look like drowning”. The instinctive drowning response is what people do to avoid actual or perceived suffocation in the water. Focused on trying to keep the mouth above water to the exclusion of useful effort to attract help or self-rescue and it is often not recognised by onlookers. Lateral arm movements, a vertical posture, tilting back the head, inability to keep the mouth above water to breathe, shout or talk. Panic drives irrational behaviour if someone comes near to help and explains why multiple people can drown when trying to rescue the first person in trouble. Drowning is often silent and swift (they’re at the surface for 20-60 secs) Lacking air the person cannot raise their arms, wave, grab a rescue aid or kick their feet. Sometimes the person looks as though they are trying to climb out using an invisible ladder, they may sink to the floor or they may roll head over heels in the water if they have engaged their stomach muscles and become confused about which way is up. They can be within arms reach of safety, near people who are unaware. Toddlers can drown whilst laying face down in a few inches of water, having frozen in panic. mariovittone.com/2010/05/154/
3. Luis Miguel Pascual-Gomez is a colleague from the Lifesaving Foundation CLG & he published a study on years of videotaped pool activity in 2011 for the early detection of those at risk of drowning and the implications on training and performance of professional lifeguards.
[Researchgate.net/publication/319178308_Early_Detection_of_a_person_at_risk_of_drowning_Implications](https://www.researchgate.net/publication/319178308_Early_Detection_of_a_person_at_risk_of_drowning_Implications)

A SUBCONSCIOUS DEMAND FOR HOMEOSTATIC STABILITY (From 'How to help people float')

“Identifying the body’s underlying demand for stability we humans, like all living creatures, are continually making subconscious homeostatic calculations from a cellular level in order to maintain a stable internal environment for our organismal survival”.

“These subconscious homeostatic calculations form the dynamic basis of heuristic decisions that we make and determine how we generate our experiences of time”.

“When our faces are immersed in cooler-than-core-body-temperature-water our brain-body system has evolved to determine via sensory chemoreceptors that it must switch to more stringent rules for oxygen usage and energy expenditure sharply re-evaluating budgetary timescales and ‘feeling’ the degree of appropriateness (the likely safety) of our current emotional state”.

“Forced floating practices by well-meaning individuals can be damaging because they ignore how human proprioception forms. Without proprioception the body lacks the necessary kinaesthetic models used to balance, orient, and move”.

(Andrews 2019)

WHAT HUMANS USE INSTINCTIVELY TO MAKE INTER ANIMATION EASIER

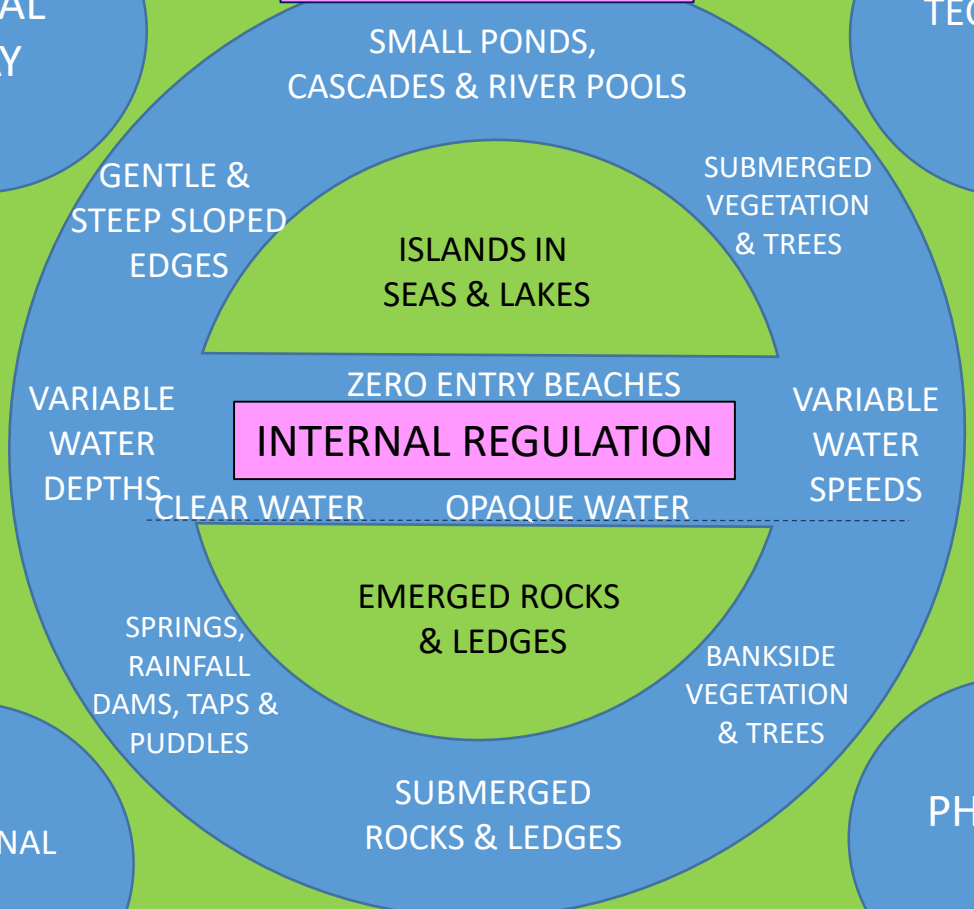
- ATTUNED SUPPORT**
- Light touch
 - One hand or no hands
 - Two hands or two feet
 - One foot or no feet
 - Chin resting or tucking in
 - Rotating body
 - Balancing
 - Sitting
 - Loose limbs, gut & neck
 - Kneeling
 - Standing
 - Laying flat
 - Feet first
 - Bending at the waist
 - Arms up or down
 - Arms out or in
 - Arms crossed
 - Legs folded up or crossed
 - Walking & running
 - Floating vertically & rotating
 - Floating at the surface
 - Resting on the floor
 - Resting in the water

SOCIAL PLAY

WATCHING & COPYING

TECHNICAL PLAY

FACIAL & BREATHING PLAY



FEELING & STARTING

EMOTIONAL PLAY

FEELING & STOPPING

PHYSICAL PLAY

INDEPENDENT BODY MAPPING

- NATURAL STRUCTURES**
- Edges
 - Ledges
 - Slopes
 - Steps
 - Ladders
 - Poles
 - Handrails
 - Troughs
 - Platforms
 - Frames
 - Ropes & Vines
 - Tethers
 - Hoops
 - Slides
 - Chutes
 - Bowls
 - Tubes
 - Floors
 - Physical Gaps

BODY MAPPING

ANYTHING THAT REMOVES DISTRACTIONS FROM FEELING SAFE IN THE WATER

REDUCING THIGMOTAXIS

2. FROM EXTERNAL CURIOSITY TO INTERNAL EXPLORATION

2. INTER ANIMATION POINTS THE WISE NOVICE'S ATTENTION INSIDE:

Immersion amplifies interoception (felt signals from the viscera), magnifies fleeting or persistent feelings and all past emotional experiences are scrutinised for their accuracy and value in establishing the ground rules of the new environment. Beliefs are felt and the nervous system is tasked with building & using a new form of **subconscious perception** from a more relevant internal source for becoming calmly self-reliant in water. The retraining is done by calmly playing with beliefs, **rhythms & predictions** from causes & effects. The body aims to generate powerful new memories of pivotal outcomes in order to prime itself & the brain properly with **fundamental aquatic insights**.

3. FROM EMOTIONAL TURMOIL TO SELF-TRUST

3. PRACTICING EMOTIONAL CALM LEADS TO SELF REGULATION & EFFECTIVE AQUATIC MOVEMENTS:

Inter animation in water requires & helps calm the untangling & regulation of felt emotional states. The result of being able to let go of past errors and remaining open to new information from the senses in water is **a strong and independent self-control mechanism** inside the nervous system. When the nervous system becomes physiologically open, efficient and flexible it becomes the go-to-place to rely upon when future challenges arise in the water.

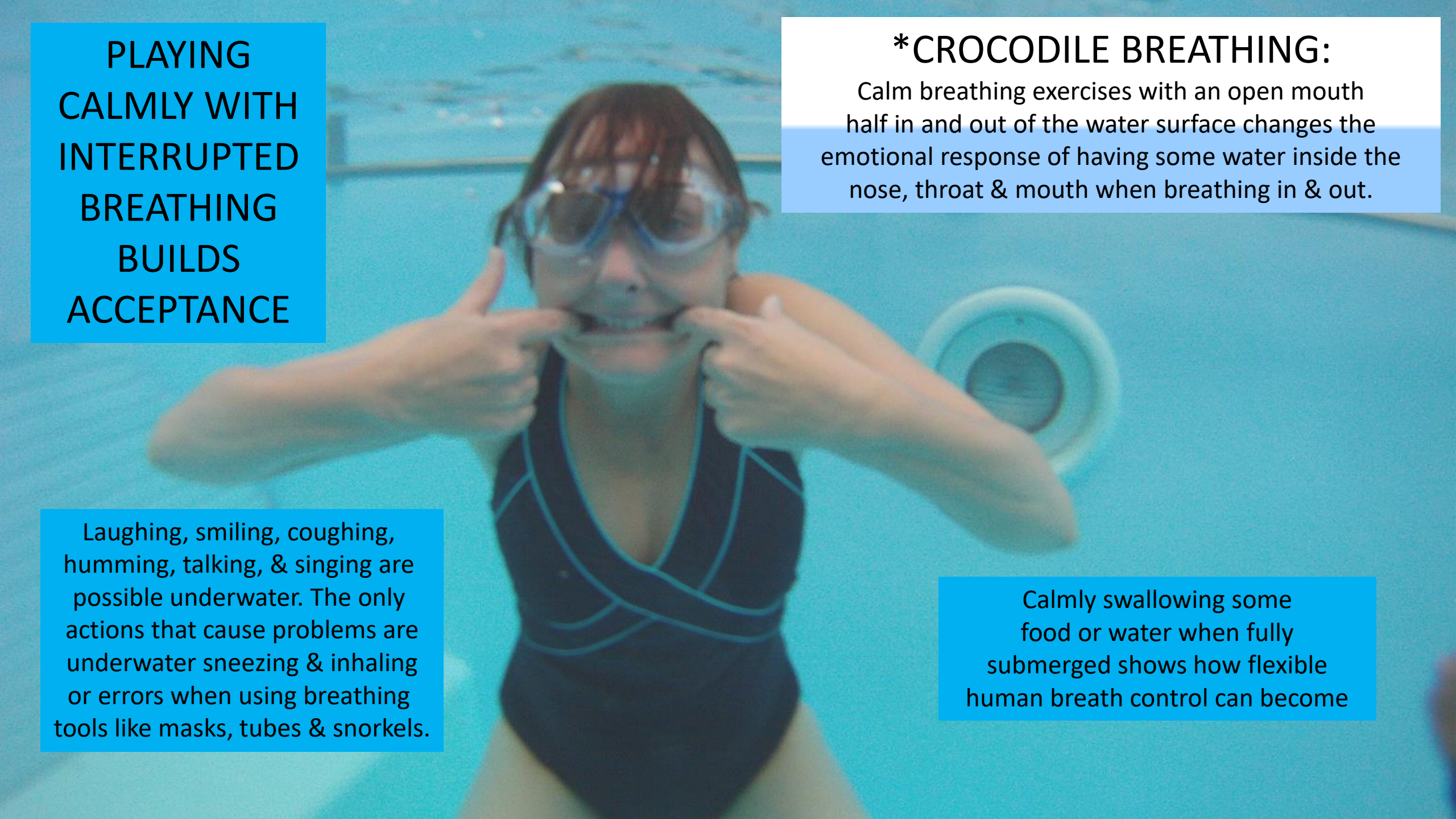
PLAYING
CALMLY WITH
INTERRUPTED
BREATHING
BUILDS
ACCEPTANCE

Laughing, smiling, coughing, humming, talking, & singing are possible underwater. The only actions that cause problems are underwater sneezing & inhaling or errors when using breathing tools like masks, tubes & snorkels.

*CROCODILE BREATHING:

Calm breathing exercises with an open mouth half in and out of the water surface changes the emotional response of having some water inside the nose, throat & mouth when breathing in & out.

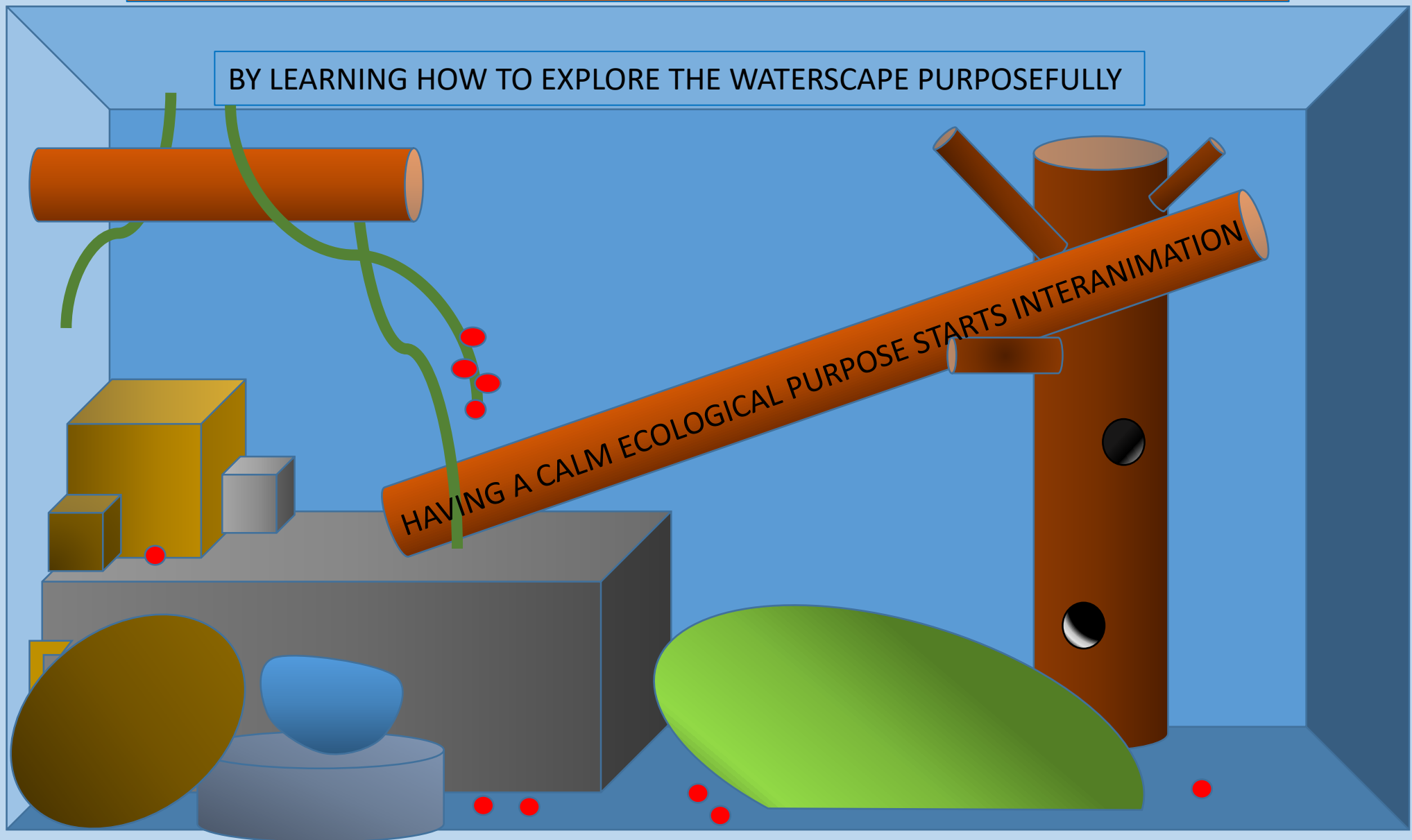
Calmly swallowing some food or water when fully submerged shows how flexible human breath control can become



1b

REMOVING THE NEGATIVE IMPACTS OF THIGMATAXIS

BY LEARNING HOW TO EXPLORE THE WATERSCAPE PURPOSEFULLY



Ref: Kallai, J. et al (2007), Cognitive & Affective Aspects of Thigmotaxis Strategy in Humans, *Behavioural Neuroscience*, 121; (1), 21-30, Research Collection.

FINDING A SAFE PLACE OR CONTROLLABLE SPACE



MY HOME POOL

A scenic view of Man O War Bay in Lulworth, Dorset. The image shows a rocky coastline on the right with a sandy beach. The water is clear and blue, with some rocks visible in the shallow areas. The sky is a clear, bright blue. The overall scene is peaceful and beautiful.

Man O War Bay, Lulworth, Dorset

AQUATIC RESILIENCE GROWS BY RAISING THE TONE OF THE VENTRAL VAGAL NERVE (VT).

1. Warmer water is much better for learning in but cold water stimulation also increases Vagal Tone.
2. Low resonant humming underwater (nitric oxide is produced in the paranasal sinuses)
3. Slowing breathing to half the normal pace (5 or 6 breaths /min) triggers rest responses.*
4. Breath holding slows the heart by reducing chest volume & triggering blood pressure changes.*
5. Longer exhales into water increase Vagal Tone and occur because water is thicker than air.
6. Breathing pace & intervals similar to 'Ocean breathing' or 'Triangle breathing' cause stimulation.
7. Putting the chin down towards the chest stimulates the vagus nerve through light compression.
8. Social engagement flows aided by; sound, heart & brain wave entrainment, skin touch & oxytocin.
9. Meditative like flow learning states during inter animation increases Heart Rate Variability.
10. 'A change is as good as a rest'. The process of switching to an aquatic mode is pleasurable release.
11. Misophonia (hypersensitivity to sounds) is dampened under water.
12. Inter animation provides a calming sense of inner purposeful cause & effect to begin.

*Erika Schagatay discusses the Mammalian Diving Responses in her excellent WHAT talk on freediving.

*Crocodile Breathing of the Nelms Metod enables calm breaths to be taken with some water in the mouth.

4. EMBODIMENT SHARED IS SOCIAL LEARNING SQUARED

4. A POWERFUL STATE OF DEEPER SOCIAL COMMUNICATION HAPPENS IN WATER:

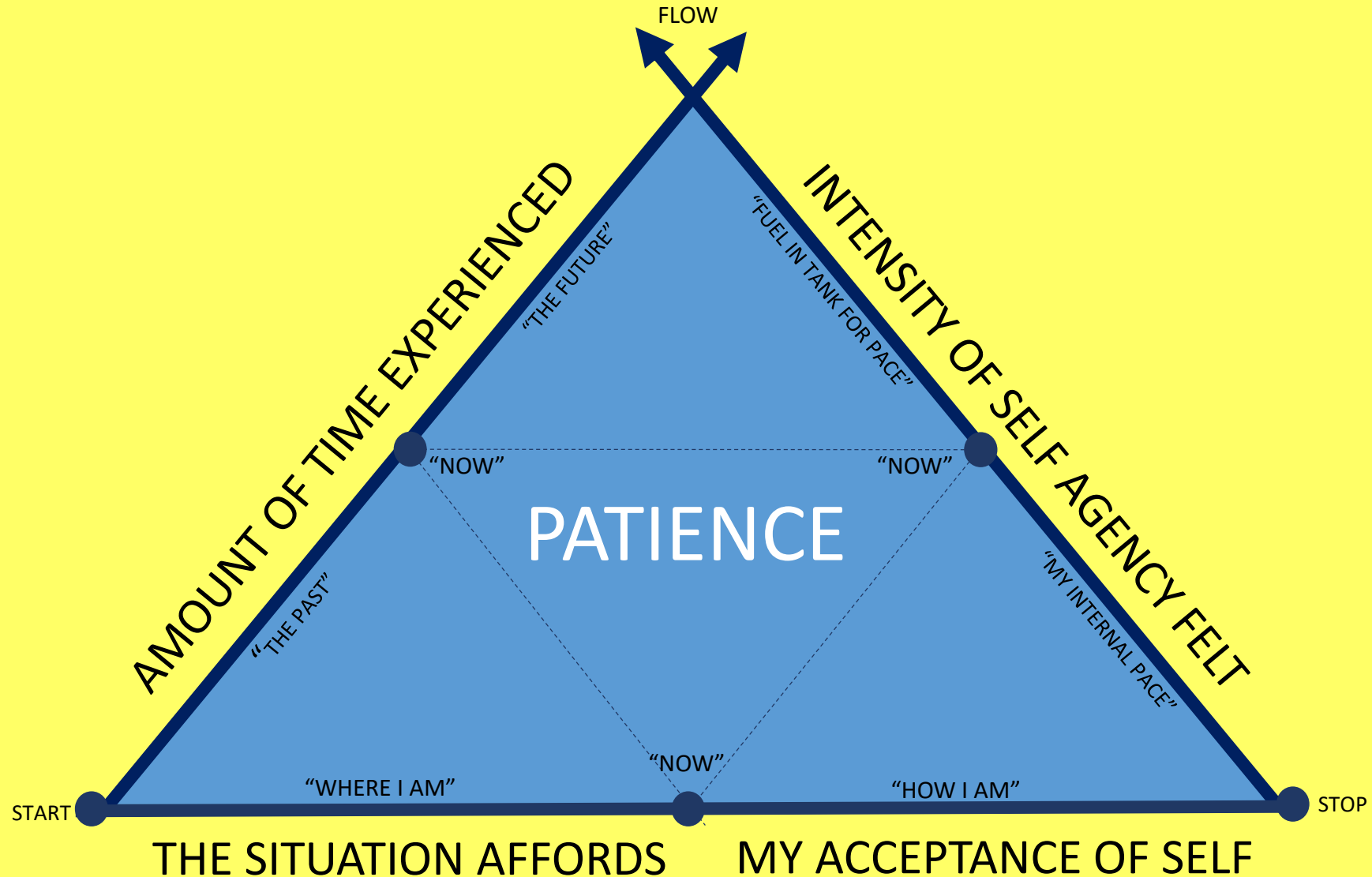
Embodied memories of removing dysregulation, making mistakes, playing with risk & using self-regulation in water enables aquatic learners to **instinctively read** what is being used in **the nervous systems of other's bodies**. This happens much faster by entrainment in water between close individuals via matched internal states during safe and enjoyable spells of unspoken and physical dialogue. Babies cannot regulate their emotions without the support and modelling of close elders but are still wired to inter-animate strongly with water. Their developmental steps are sped up by starting to watch, mirror, mark, match, copy, give, take, float, hold their breath, feel rhythms, move & more.

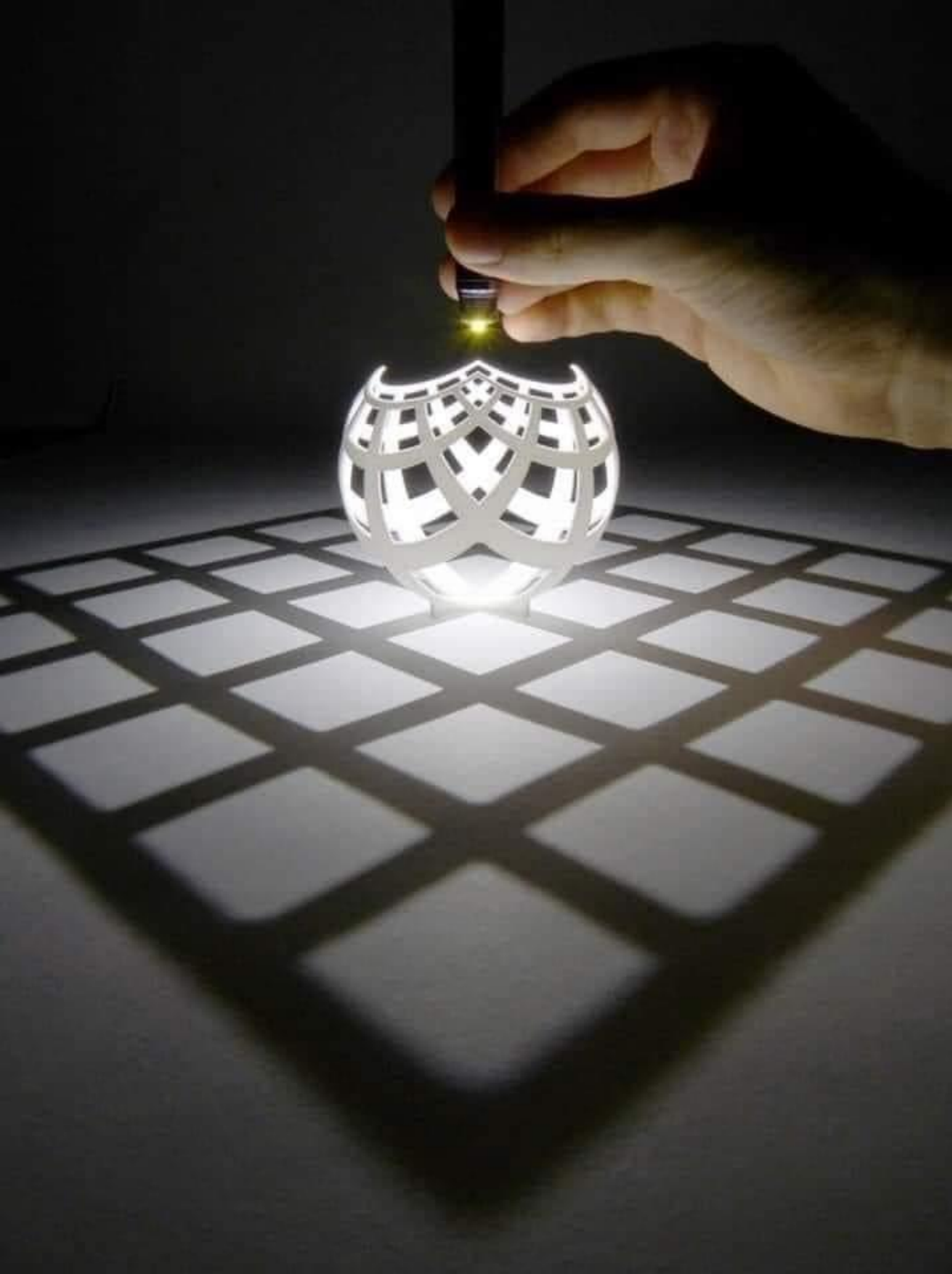
5. USING AQUATIC PATIENCE

5. THE RATCHET OF RESISTING PANIC:

Aquatic patience is critical to survival in water because the powerful hidden machinery and learning output of inter-animation close off without it. In cultures closely attuned with water it is an intrinsic part of engaging safely with the environment from the outset. Similar to elite movement connoisseurs, yoga experts or experienced meditators, aquatic patience in resilient swimmers is most likely to be measurable as increased white matter in the brain, high heart rate variability & high vagal tone, helping them cope well under duress in dynamic environments. **A powerful intuitive flow state for effective survival and thriving in water becomes readily available to aquatic individuals.**

THE DEEP WATER RATCHET





Changing Our Perception from 2D to 3D (&4D)

**“Have you witnessed yourself or someone else
becoming joyful and free in the water;
when their inner relationship with
the surrounding environment
switches on a light and
illuminates new
dimensions
inside
it?”**



No longer so attached to external safety structures & keen to go beyond the 2D interface with the air.

No longer feeling trapped inside the water like an empty negative crystal.

“Able to rest calmly in the water,

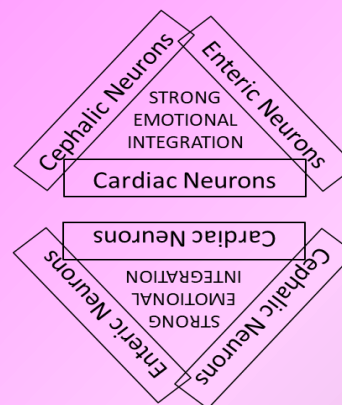
choosing where to go next,

when to breathe air

and how much

energy to

use”



WATER
LEARNING
LORE

WHAT DID INTER ANIMATION IN WATER BRING OUR ANCESTORS?
(THE BIRTH OF GEOEXPLORATORY LEADERSHIP?)

WATER
SAFETY
LORE

A bird's eye
view of the
aquatic floor
to inspire new
PERCEPTION

BATTLE wisdom using
a SENSE of unknowns

1. TIME

Use of many SLOWER
affordances

Geo-adaptive
FREEDOM to
IMAGINE distant
habitats

2. More access to FOOD

3. Absorbing RHYTHMS & AMBIGUITY

4. SUPPORT against gravity for REPAIR & REST

5. ENTRAINMENT for regenerating nervous systems

6. Negotiation of SPACE in an environment WITHOUT THIGMOTAXIS

7. Physical INTELLIGENCE upon which to build strong internal SELF-REGULATION of emotions

8. Some significant hydrostatic & orthostatic CHANGES in the dynamic operations of blood pressure

9. SELF & INTER-personal TRUST, travel, socio-cultural support, tools, technology, strategies & SPEECH

10. LONG developmental pathways, increased RESILIENCE, increased survival for grand parenting

11. Chaos & uncertainty on land led to the use of water as an emotional REFUGE & freed energy for

12. COURAGE & INFERENCE to EXPLORE & ADAPT.

SELF-AGENCY
to WAIT instead
of freezing
or fleeing

FEELING
INTUITIVE
insights
ON LAND

*Honed sense
of TUNED
VERTICAL
BALANCE

Access to
RESOURCES &
THE FLOOR
Through free-diving

Highly
adaptable
BREATH
CONTROL

Advanced
embodied
READING
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Advanced
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USING INFERENCE TO MAKE SENSE OF THE WATER (IN TIME)

What is a 'Cause', and Why Does it Happen Before the Effect? Carlo Rovelli

<https://youtu.be/jCRBmRp7eLs>

The Franke Program in Science & the Humanities, Yale University.
Understanding the Nature of Inference Colloquium Series (Feb 26th 2021)

ZERO time in physics doesn't mean everything is frozen. Things happen but they are not ordered in space time.

Everything that moves can be used as a local clock. As little as 30-40cm in altitude changes the physical rate of time.

“Through the quantum properties of gravity we can INFER CAUSATION”. “What happens if I do something & I know the past?”

“The emotional sensation of UNIFIED time passing IS the flowing of time that classical general relativity can't distinguish as real”.

“This is the deep emotion of time that is both making us & destroying us”. Physical inference in water is INTER ANIMATION.

1. The RATE at which time passes slows down the faster you're moving & the closer to a large mass you are located. (Emotionally & physically)
 2. Time is not a universal measurement of NOW, because it is so localised to areas and it's structure is controlled by gravity.
 3. Physics finds it difficult to DISTINGUISH between the past & the future unless there is heat/temperature/friction which leaves a TRACE (memory).
 4. The natural world moves from ordered energy to disordered energy on the macroscopic level generating the arrow of time but the quantum level is built upon probabilities & chaos.
 5. Time for us is a combination of memory & expectation (we grasp a piece of the past & try to compute the future)
 6. The loop quantum gravity theory is a mathematical description of the quanta of space time. The loops are linked together to form space.
 7. “You can have a dynamic & a passive view of the past & that depends upon the system & subsystem in question”.
- Priyanvada Nataranjan (1:13:07/1:40:44)

USING GEOMETRY TO CONCEPTUALISE AN ABSENCE OF STRUCTURE

“Artificial intelligence can’t come close to matching the human ability to conjure a flexible virtual operational space”.

“First recognised by Rodney Brooks Embodied cognition: Evolution constantly uses an engineering strategy of sticking some of the problems of control out in the body parts rather than trying to solve everything in the brain”. (Scott Grafton, Physical Intelligence, 2021 p104)

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HOW HUMANS LEARN HOW TO EXPERIENCE, EMBODY & USE SPACE?

Carlo Rovelli talking about the origin of causation (From 1:12:26)

“What happens if I do something & I know the past? That’s causation. It allows us to look at past & future. We are using this logic to understand Nature. It is a powerful logic but it’s a sort of high level logic”.

A question to Carlo Rovelli from Nicholas Gall (From 1:19:20)

“So is the concept of agency & the derivative concept of causation merely a form of stance (as in the sense of that described by Daniel Dennett for example) an ‘agential stance’ like ‘intentional stance’ or does this just give us more fruitful predictive power?”

“More generally Albert Einstein’s ‘past hypothesis of low entropy’ is another stance, one that is fruitful for our macroscopic purposes”.

Reply from Carlo Rovelli to Nicholas Gall

“Not sure, immediate reaction is no. De facto we have & use a macroscopic description which generates causation. So, it is not a stance, it’s just a narrative description. At the fundamental Quantum level the time narrative doesn’t work. Is it a choice of a perspective? It could be.”

“If we modelled a deterministic system without chaos & uncertainty (no quantum foundations) then agency is a stance”.

My current view:

By experiencing one-ness with the water from learning unconsciously in-the-moment and then feeling a strikingly new agential stance (using aquatic vertical posture & eye lead movement as a frame of reference) we become freer to rest & move through time and space untethered to any external object for safety. This extra agency (free energy) turns patience into a ratchet. On land we live in chaos and uncertainty and use a deterministic system to cope which was first developed in water.

6. FROM SELF-DIRECTION TO COMPLEX CULTURE

6 & 7. EVOLUTIONARY RATCHETTING FROM LONGER LIVES ENGAGING MORE DEEPLY WITH WATER?:

Effective movement emerges spontaneously (intuitively) from inter animating with water and perhaps conscious technological but unspoken thought sharing with directed movements developed from initially experiencing increased **species self-assertiveness**. Ecological exploration led this via inter animation in an environment that is overwhelming to most terrestrial air breathers? From **unconscious crocodile breathing, resonant humming** and extended lives using the aquatic learning loop with others in reciprocal learning, water has likely facilitated vocal development enormously. Water also allows disabled, aged & grand-parenting individuals to survive & thrive far longer than they would do on land, rewiring damaged nervous systems and providing new space-time for forages.

7. THE TROUBLING VULNERABILITY & REDISCOVERED AQUATIC MODE OF MODERN HUMANS

7 & 6. WHAT IS STOPPING THE ACCEPTANCE OF MORE AQUATIC PERSPECTIVES?:

The evolutionary development of human speech has led to complex, religious & technological civilisations and yet the visual-verbal lives we live today on land have inadvertently stopped many humans from using the **powerful intuitive side of the human nervous system** both in the water and on land. The subconscious nervous system maintains-our-survival unseen so that our brains are free to carry out higher intellectual functions unhampered but for far too long it has been assumed to also play a rather inferior role in the learning of complex physical skills. Research into **Human Aquatic Physical Intelligence** suggest this imbalance needs redressing. Narratives for human learning & evolution in & out of water are starting to change as a result of this new psychophysiological data.

INFERRING WHAT CONDITIONS WERE NEEDED FOR THE WATERSIDE APE TO EVOLVE?

1. CURIOSITY about exploring inviting & exit able water conditions in a familiar submerged landscape to retrieve familiar forage.
2. Using terrestrial movement patterns to only engage swiftly & superficially with the waterscape without stopping.
3. Slow removal of thigmotaxic attachment to the surface for shallow retrieval & diving via FACIAL INTERANIMATION.
4. Seeing inviting new foraging opportunities in a familiar submerged landscape via FACIAL & CORE INTERANIMATION.
5. Slow removal of thigmotaxic attachments to fixed structures for open water & deeper diving with WHOLE BODY INTERANIMATION.
6. Inviting new foraging opportunities in a new waterscape via EMOTIONAL BALANCE from WHOLE BODY INTERANIMATION & CURIOSITY.
7. Survival to subconsciously support off-spring to PATIENTLY INTERANIMATE & make EMOTIONAL mistakes in water through 1 to 6.
8. Extension of personal survival times with or without DISABILITIES to GRAND PARENT for own off-spring & others' off-spring.
9. Increased need for insight, reflection & curiosity (EMOTIONAL PATIENCE) causes verbal lore & a CONSCIOUS aquatic mind set to emerge.
10. Today many people restrict their thoughts to 1 & 2 because the terrestrial output of our conscious mind dominates our life on land.

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MORE DETAIL ON HOW WATER ENTRAINS US

1 . Water powerfully entrains us if we allow ourselves to interanimate with it instinctively. Most land animals can survive for short periods of time with automatic movement patterns. Humans may not and usually need priming in water through interanimation which drives a deeper engagement system.

2. Interanimation allows us to isolate (feel) how the individual components of our senses work by amplifying our internal sensations (interoception) through more feedback loops per second (more informative information) & semi-predictable patterns of cause & effect (rhythmic information).

3. We can learn how to gain control over our internal state (feel emotional regulation) when we have removed the need for fight or flight in the nervous system & the ventral vagus nerve is in strong working order through constant use (vagal tone is high) The nervous system becomes much more efficient and increasingly resilient under challenging circumstances which improves our chances of surviving in water.

4. Embodied memories of removing dysregulation & using self-regulation allow us to powerfully read others by identifying & enhancing what sensorial components they are using on the inside in water.

5. Aquatic patience drives calm physical intelligence in water and ratchets up emotional intelligence & geo-adaptive potential.

6 & 7. Evolutionary ratchetting from enjoying extended lives & resources by using aquatic patience to wield powerful self-control.

7 & 6. Speech advances technological sharing but can now also disconnect us by distraction from our innate physical intelligence.