TRIUNE MIND FINDS HOME IN TRIUNE BRAIN:
An Exercise in Buddhianscience & Westernscience

Suwanda H J Sugunasiri, PhD
(Author of "Devolution and Evolution in the Aggañña Sutta")

1. Triune Mind in Buddhianscience

In my last study, Triune Mind (Sugunasiri, 2014), I sought to understand the three terms in the Canon that refer to the Mind\(^1\), namely *Citta*, *Mano* and *Viññāṇa*, to list them in alpha order. While in places they are shown as cognates, having the same meaning, elsewhere they occur with clearly differential meaning, in distinct contexts. It is this seeming contradiction – i.e., both synonymity and variability, that I sought to explore in the paper.

The methodology was to see the roles played by each of Mano, Citta and Viññāṇa in a Stream of Consciousness, made up of 17 mindmoments (Abhidhamma)\(^2\), beginning with a stimulus and ending with storing the input. It is captured in diagrammatic form as follows:

![Fig. 1: The 17 Mindmoment Process, from Stimulus to Life-Continuum Consciousness, in relation to Mano, Citta and Viññāṇa](image)

As captured in the next Diagram, Mano comes to be characterized as the *R-Mind* (R = Receiving), Citta as *J-Mind* (J = Judging) and Viññāṇa as *E-Mind* (E = Executive):

![Fig. 2: Characterization of the Triune Mind in terms of Function](image)

---

\(^1\) Except when they occur in the Pali original, or is in a quotation, ‘Mind’ here, and later Mano, Citta and Viññāṇa begins with a capital, to identify it as the topic of the discussion, a practice that will be followed throughout the paper.

Each of Mano, Citta and Viññāṇa is seen here having a single function, thereby coming to be characterized as **M-simplex, C-simplex and E-simplex.** But we go on to show how each of them is much more than that, both individually and relationally. In this sense, each of them comes to be labelled **M-complex, C-complex and E-complex.**

Following a full explication of Mano, Citta and Viññāṇa, both as simplex and complex, we bundle them up into a ‘Triune Mind’, literally, ’3 in 1 mind’ (see Sugunasiri 2014 for the full treatment).

### 2. Triune Brain in Western science

‘Triune Brain’ is a concept proposed by Dr. Paul Maclean in 1969, and developed in a longer treatise in 1990\(^3\). In a study of it by Dr. Richard M. Restak, a medical practitioner (Restak, 1979), we have the perspective outlined in the following words: “According to MacLean, we are the possessors of a Triune Brain – not one brain but three, each with its own way of perceiving and responding to the world.” (50 ff). They “amount to three interconnected biological computers, each having its own intelligence, its own subjectivity, its own sense of time and space, and its own memory and other functions”\(^4\).

Continuing, “the brain is somewhat like an archaeological site, with the outer layer composed of the most recent brain structure, the cerebral Cortex, which is developed in primates and reaches its greatest level of complexity in humans. Deeper layers of the brain contain structure of our earlier evolutionary forebears, the reptiles and mammals”. Still further, in its evolution, the human brain expanded “in a hierarchical fashion along the lines of three basic patterns. These three formations are markedly different in chemistry and structure and, in an evolutionary sense, [and] are eons apart” (52).

So there we have it. Three brains\(^5\). What, then, are these three brains?

To give MacLean’s version, “The first, most primitive”, which MacLean dubs **R-complex** (R for ‘Reptilian), is “a deeply placed series of brain structures that make up almost the entire mass of the brain in lizards and reptiles” (52). We can, of course, see why it would be called a ‘complex’. It is simply that it is made up of a series. Like every other part of the brain, it has multiple functions in an intricate interrelationship.

And “As we climb the evolutionary ladder, the R-complex becomes less conspicuous, until in humans it is greatly overshadowed by the cerebral Cortex”, called the **Neomammalian brain.** It is called ‘mammalian’ since the structure itself, though enlarged in humans, is specific to the mammals, with the lower animals not even having such a structure\(^6\). In between is the **limbic system**.

---

\(^3\) Maclean, Paul, 1990.
\(^4\) For some associated studies relating the Triune Mind, see also http://www.kheper.net/topics/intelligence/MacLean.htm.
\(^5\) This, of course, is not to say that none of the cortical functions are present in lower animals, even if at a most rudimentary level. It is only that no explicit physical feature has come to be developed, precisely showing that the function is simple enough to be handled by an existing part of the physical structure.
3. Critique of the 'Triune Brain' Model Re-visited

While this hypothesis is no longer espoused by the majority of comparative neuroscientists in the post-2000 era, let us first present the theory in a little more detail in order to allow us to take a closer look at the critique.

MacLean calls the 'most primitive' brain the R-complex (R standing for 'Reptilian'), on the basis that it is a series of brain structures "that make up almost the entire mass of the brain in lizards and reptiles". Now this is one of the bones of contention of critics of the Triune Brain theory:

... the basal ganglia (structures derived from the floor of the forebrain and making up MacLean's reptilian complex) were shown to take up a much smaller portion of the forebrains of reptiles and birds (together called sauropsids) than previously supposed...

What this says, then, is not that the brain structure called the R-complex is not based in a scientific reality, but that it occupies a far less physical area than claimed by MacLean, and that the feature is present in other animal species, namely birds (sauropsids together). But not only, for -

basal ganglia are not limited to reptiles, as surmised by MacLean, but that they do exist in amphibians and fish as well as mammals and sauropsids. Because the basal ganglia are found in the forebrains of all modern vertebrates, they most likely date to the common evolutionary ancestor of the vertebrates, more than 500 million years ago, rather than to the origin of reptiles.

Again, the critique doesn't reject the presence of basal ganglia in reptiles, but that they are found in others, taking us as further back in evolutionary time. So the issue may more be one of labeling and timing.

Another critique is that-

[s]ome recent behavioral studies do not support the traditional view of sauropsid behavior as stereotyped and ritualistic (as in MacLean's reptilian complex). Birds have been shown to possess highly sophisticated cognitive abilities, such as the toolmaking of the New Caledonian crow and the language-like categorization abilities of the African grey parrot.

Here, the particular behaviours, such as in the example given, namely 'display' in squirrel monkeys, has been seen to be 'stereotypical' and 'ritualistic', in a supposed contrast with cognitive abilities. But to see them as dichotomous categories seems to not understand the sentient condition, meaning 'having senses', including, from a Buddhist point of view, the mindsense. The basic question is whether in ritualistic, meaning, habitual behaviour, no cognitive process is entailed. Our sense is that it indeed does, since the left and the right hemispheres, associated with cognition and affectivity respectively, do not work in isolation, the two being parts of the same system, namely mindbody (nāmarūpa) as in Buddhism.

---

<http://en.wikipedia.org/wiki/Triune_brain#Reptilian_complex>, all quotes drawn from this source.
MacLean’s example may come from the animal domain. But given that in the Buddhian understanding, animals and humans fall under the same phylogenetic scale, namely sattā, literally ‘sentient being[s]’, let us take an example from the human sphere. Can a religious person, e.g., praying at the church every Sunday, an ostensibly ritualistic behaviour, be said to entail no cognitive skills? The invoked source of expected benediction, namely, from a Buddhist point of view as also in Western science, may be a non-existent God, but that is not to say that prayer is done in a non-cognitive frame of mind. Prayer is done in the rational thought that condition A (prayer) will result in condition B (benefit), and in the further rational thought that the outcome can be nothing but good, as opposed to something bad. And distinguishing between good and bad surely can hardly be argued to be non-cognitive, given that the distinction is based in an understanding, cognitively arrived at, of what could be harmful or not to oneself. Distinguishing requires that the features and the parameters of the two distinct entities be identified, this surely entailing a cognitive process. Knowing that good is good for you, and bad is bad, itself is an act of cognition, based in the rational thought that what is good helps life and keeps it going. Prayer also provides a calmness of mind, again a rationally expected outcome of the ‘ritualistic behaviour’.

The practice of paying homage to the Buddha could help shed more light on the issue. Paying Homage to the Buddha easily qualifies as a ritual7, but yet, it is an extremely cognitive act. A first cognition is that the ritual will minimally keep the mind from being bad for the duration of the ritual. At a more positive level, it will help bring one’s mind into focus (ekaggata), and the mindfulness (sati) thus entailed can be said to usher in a frame of mind that can help cultivate peace within oneself, during the Homage as well as in the long run, over time. This could serve as a condition that could possibly lead to even secular outcomes, such as better productivity in the workplace, better overall health and happiness, etc. So paying homage, while a ritual, is hardly bereft of cognition and reason. The issue is not whether Homage will bring all these wonderful outcomes to all those who engage in it at all times, but that underlying the practice could only be a good intent, a full-blooded cognitive process, the Buddha’s words being ‘Intent, I say... is kamma8.

On a more mundane level, waking up in the morning, having a breakfast and getting to work on time can be all seen as ritualistic and habitual behaviour. And if I were to say that they entail no cognition, or sophisticated thought, I know that I will be written off as simply nuts!

The point, then, is that cognition is very much part of habit. Thus we could see that a squirrel monkey displaying is based in the cognition that it will not only earn social acceptance but also an existential benefit. An outcome of not getting the nod from the elders might be death itself, this itself entailing cognition. So, can it be said that the ritual of display does not entail cognition? We can thus dismiss the critique as having no rational basis, and being based in a Cartesian duality, the reality being, as in the Buddha’s teachings as well as in Western science, that sub-systems of a system are all inevitably interrelated.

The example, as in the critique quoted above, of birds possessing ‘highly sophisticated cognitive abilities’, such as the toolmaking of the New Caledonian crow and the language-like categorization abilities of the African grey parrot, indeed suggest a range vis-à-vis habit and cognition. While display in squirrel monkeys does indeed entail cognition as argued for above, it can be said to be closer to the lower end of cognition given that cognition is merely implicit. Tool-making and language-like abilities, on the other hand, can be seen as being closer to the

---

8 Nibbedika Sutta, Anguttara Nikaya 6.63.
higher end since cognition is more explicit. So the critique can be dismissed as being based in a faulty understanding of the sentient mind. When we then understand reality of habitual behaviour and cognition working in tandem and in interrealational and relative terms instead of in dichotomous terms, critique of MacLean’s example of squirrel monkeys displaying seems to fall flat. Of course, in fairness to the critics, it could be said that MacLean himself has invited the critique by not being more comprehensive in his analysis.

Another shortcoming seen in MacLain’s theory is that the structures of the limbic system, which MacLean proposed arose in early mammals, have now been shown to exist across a range of modern vertebrates. The "paleomammalian" trait of parental care of offspring is widespread in birds and occurs in some fishes as well. Thus, like the basal ganglia, the evolution of these systems presumably date to a common vertebrate ancestor.

Again, the argument is not that the limbic system with specific functions does not exist, but that its evolution dates back further, the Buddhist view of sentient life well agreeing with the thrust of the criticism. That is to say that the limbic system appearing in an earlier evolutionary period does not take away from the fact of its functions. A final critique of MacLean Neomammalian brain:

...recent studies based on paleontological data or comparative anatomical evidence strongly suggest that the neocortex was already present in the earliest emerging mammals. In addition, although non-mammals do not have a neocortex in the true sense (that is, a structure comprising part of the forebrain roof, or pallium, consisting of six characteristic layers of neurons), they possess pallial regions, and some parts of the pallium are considered homologous to the mammalian neocortex. While these areas lack the characteristic six neocortical layers, birds and reptiles generally possess three layers in the dorsal pallium (the homolog of the mammalian neocortex). The telencephalon of birds and mammals makes neuroanatomical connections with other telencephalic structures like those made by neocortex. It mediates similar functions such as perception, learning and memory, decision making, motor control, conceptual thinking, and tool use.

Again the point argued is not that a neocortex does not mark mammals, but that certain other, and earlier, species also have been found to be with neocortical functions.

In sum, then, the critique of the Triune Brain as proposed by MacLean is primarily two-fold: (1). that the historical time periods assigned to each of the three brains are far too late in the evolutionary process, and (2). that animals other than mammals and vertebrates share at least some rudimentary forms of the characteristics of each of the brains as assigned by MacLean in relation to only reptiles and mammals. All this is then only to say that while the details may vary, none of the objections take away from the tripartite nature of the brain, namely brain stem

---

9 It needs to be noted that the critique of the Model is as I have found on online, and may not be comprehensive, though could be the most recent. But for our purposes, that shouldn’t matter, since all we were looking for was the most salient aspects of the critique.
and the cerebellum (basal ganglia), mid-brain with limbic functions and the neocortex. The time of the evolution of the Triune Brain might be controversial, but the fact of it is not. For in our understanding, the term *sattā* 'sentient being' is encompassing enough to take us back to the earliest evolutionary times, and are applicable to not only the later species but the earliest of species as well. Thus it is that we see that the model of the Triune Brain provides a useful comparative basis in relation to the Triune Mind as outlined in my earlier study.

Let us then explore the Complex triad in a little more detail, allowing ourselves some repetition.

4. Protosentient, Paleosentient and Neosentient Brain Complexes:

   Retention of Model through Rebranding

We have seen how MacLean’s characterization of the Brain in evolutionary terms has come under fire. But it appears that it is the labeling that is more the problem than the substance itself. It is simply that the labels Reptilian Brain (or R-Complex), Paleomammalian Brain and Neomammalian Brain tend to misname the psychophysical content encapsulated in each of them. So instead of throwing the baby out with the bathwater, we seek to drain the dirt in the bathwater through rebranding it more descriptively and accurately, thereby allowing us to both eat the cake and have it, too, if I am kindly allowed to mix metaphors here. Here then is our proposed re-branding:

<table>
<thead>
<tr>
<th>MacLean</th>
<th>Sugunasiri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reptilian Brain (R-complex)</td>
<td>Protosentient-Complex</td>
</tr>
<tr>
<td>Paleomammalian Brain</td>
<td>Paleosentient-Complex</td>
</tr>
<tr>
<td>Neomammalian Brain</td>
<td>Neosentient-Complex</td>
</tr>
</tbody>
</table>

**Fig. 3: Alternative Labeling for the Triune Brain**

One of the major fault lines in MacLean’s characterization is that earlier and/or other animal types have been found to possess the characteristics that he had assigned, based in the research of the time, to a specific animal type - Reptilian Brain to reptiles and the Paleo- and Neomammalian Brain to mammals. Of course, the finding that animals predating reptiles and non-mammals possessing features associated with them should hardly be surprising. An acorn tree can come out of only an acorn seed. That is to say that while the tree would show advanced features of acornness, the ‘acornness’ would already have been not just implicit, but ‘present’ in some shape or manner in the...
seed itself. Likewise ‘treeness’ in the seed. While a seed shows not a trunk, branches, twigs and leaves, it will not grow into a rock or water, both being insentient, or an animal, being complexly sentient, but only into an acorn tree. The point then is that the fact that the early hints of the mammalian neocortex, e.g., being present in non-mammalians, takes away nothing from the fact that mammals have a vastly developed neocortex compared to any early model. And there is no doubt that future research will take us even further back in evolutionary time in relation to the origins of a specific feature of later vertebrates and mammals, – either in terms of more locus specificity or refinement or both. This, of course, only speaks to the march of Science. So the issue then is one of boundaries, an issue overcome, as noted, by the Buddha’s term sattā which applies equally to Homo Sapiens, Hominid, an amoeba or a virus. Implicit in sattā, literally meaning ‘state of being’, are senses. So whether an organism has six senses (including the mind-sense) as humans do, or fewer in lower animals, or whether a given sense is less or more sophisticated in a given species, they all belong to the same phylogenetic scale. It is to capture this inclusivity and commonality, then, that all three proposed labels contain the term ‘sentient’ – Protosentient, Paleosentient and Neosentient.

The term ‘proto’ in Protosentient is simply to capture the idea that in evolutionary terms, it relates to ahistorical times, but without specifying a particular time frame. This helps accommodate any new research that may show that a particular characteristic associated with humans, say language, is found to be present in species other than human, and thus much earlier than thought, as e.g., “language-like categorization abilities of the African grey parrot” as in the critique above. So ‘proto’ can be taken to simply mean a range going all the way back to ‘a past we may not know enough about at any given point in time’. Or to put another way, we may understand it as referring to ‘unknown prehistoric times’, allowing for any possible future findings that basal ganglia, in however a miniature form, may go back even further than 500 million years ago (mya), as is understood today.

Neosentient, of course, should be obvious. Again, it is to capture the idea of being the ‘new kid on the block’, in contrast to the Protosentient, without however a commitment to a specific evolutionary time. Paleosentient then is intended to mean the evolutionary time in between Proto and Neo, i.e., sometime in history before the ‘neo’ era, but later than ‘proto’. It simply means ‘of an identifiable historical time frame’, the specific time moveable with research findings. It may be clear then that the concepts covered under the labels are relative.

We may note how the proposed triple characterization well fits the Triune Brain. If the brainstem is clearly the earliest, again without necessarily being time-specific, the neocortex is the latest – new kid. In between is the limbic system, physically between the cortex and the brainstem.

Every part of the brain is no island unto itself exclusively, although each does have its own little housekeeping to be attended to, and may not be shared by any other, this explaining its individuality and its very existence in the system. So while each structure, from a cell through muscle to organ, has its own duty roster, no individual structure can be said to survive or do its job without interlinking with one or more others. While, e.g., talking entails the tongue, larynx, pharynx, uvula, nasal passage, etc., each with its own contribution to make, there would no talking unless there was a thought in the mind domain, this again a complex process and there was the lung to provide the air flow. Likewise, no thought domain would even find expression in phonemes, morphemes and syntagmemes unless there was talking, or its extension, writing, singing, etc. At a micro level, a sensory neuron may intake stimuli, but without motor neurons, the stimuli would go nowhere. Likewise, motor neurons would be rendered useless unless they worked in tandem with the sensory neurons. It is to capture this interconnectivity between the different sub-systems of the system called mindbody, and the multitasking, that explains the add-on
'complex' in each of Protosentient-Complex, Paleosentient-Complex and Neosentient-Complex, continuing MacLean’s nomenclature R-complex, but also reflective of the Buddhian notion of ‘aggregate’ or ‘bundle’ (khandha; kalāpa). Our new terminology, then, hopefully meets the criticism of MacLean’s Triune Brain model. It also speaks to the issue of the presence of a given feature, say cortical layers at the physical level, habits at the behavioural level, entailing as they do cognition. They relate to sentience, without being necessarily species-specific. The terms Proto-, Paleo- and Neo- are also general enough to modify the time boundaries as new research digs out more information relating to the evolutionary process, in our own time or any time in the future.

5. Triune Mind Finds Home In Triune Brain

We have seen above the three minds in Buddhism in terms of function, and the three brains in Western science in terms of structure. So is there a parallel between the Triune Brain and the Triune Mind?

Let us begin by noting the similarity in number: three brains – Neosentient, Paleosentient and Protosentient, and three minds – Citta, Mano and Viññāṇa, listing them in alpha order and without suggesting a chronological matching. This numerical parallel may, of course, be seen to be mere happenstance and superficial. But it was noted above that while each of the three brains has its own individuality – in terms of intelligence, subjectivity, sense of time and space, and memory and other functions, the three are also interconnected, rendering the Triune Brain a ‘B-Complex’. Likewise was it noted that while each of the three minds constitutes an M-simplex (showing a distinct function for each), the three of them, taken individually or collectivity, come to be a M-Complex, with interactive and overlapping functions. In Buddhian terms, each component as well as the totality of the Triune Mind is an ‘Aggregate’ (khandha), indeed an Aggregate of Aggregates in relation to Feelings, Perception, Forces and Viññāṇa (rupa, vedanā, saññā, samkhāra, viññāṇa). By extension, then, the Triune Brain, i.e., B-complex, can also be called an ‘Aggregate’, again taken individually or collectively. The theoretical basis for this is the Buddhist Theory that wherever there is a ‘name’ (nāma), there is also a ‘form’ (rupa), and, of course, vice versa, as well captured in the Con-coor (this is my own short form) (patīccasamuppāda) link, ‘conditioned by Consciousness is Mind-body; conditioned by Mind-body is Consciousness’ (viññāṇapaccayā nāmarūpa; nāmarūpapaccayā viññāṇa). So we see that the similarity in number is not accidental or happenstance.

The devil, as well as the angel, of course, is in the detail. So our attempt now would be to explore the specifics. Towards this, we begin by positing a Hypothesis:

**Hypothesis** The Triune Mind parallels the Triune Brain.

---

11 The mindbody of a sentient being is characterized as the Five Aggregates (pañcakkhandha) – Body-, Sensation-, Perception-, Forces- and Viññāṇa–Aggregate (Samyutta Nikaya III.101), an ‘aggregate’ being “all that is comprised under” (PED, Applied meaning).
By way of seeking to establish our Hypothesis, we show the two side by side in the following Figure, now not in alpha order but, as we shall see, chronological order:

<table>
<thead>
<tr>
<th>TRIUNE BRAIN</th>
<th>TRIUNE MIND</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Neosentient Brain</td>
<td>Mano</td>
</tr>
<tr>
<td>2 Paleosentient Brain</td>
<td>Viññāṇa</td>
</tr>
<tr>
<td>1 Protosentient Brain</td>
<td>Citta</td>
</tr>
</tbody>
</table>

**Fig. 4: A Theoretical Postulate Paralleling Triune Brain in Westernscience with Triune Mind in Buddhianscience**

This Figure seeks to show how, noting the numbering bottom up, for reasons that will become evident, Citta, Viññāṇa and Mano (i.e., C-complex, V-complex and M-complex respectively) parallel the Protosentient-complex, Neosentient-complex and Paleosentient-complex (MacLean's Reptilian Brain (R-complex), Neomammalian Brain and Paleomammalian Brain respectively), now matching them diachronically, meaning, in terms of an evolutionary process.

"Alright", the diehard skeptic, scientist or other, will say, "But what has all that got to do with the evolutionary process of humans evolving from animals, over millions and billions of years, that is the domain of Westernscience?"

To rephrase the question in Buddhist terms, do the Triple Thirsts\(^\text{12}\) that characterise human sentient beings relate to animal sentient beings, too?

You bet! Take your pet dog as a case study. If your pet is not listening to you, it can be said to have 'a mind of its own', suggesting the presence of the mind-sense, if also the other five senses. Does it see you come and begin to show you his love and affection, hear you call him, get the smell of you even before you come home\(^\text{13}\), have a helluva time at the food bowl, roll in the mud for that yacky to us but heavenly to his tactile sensations? His yearning for your return or the food can be said to be another 'Thirst' in the mind-sense. Running to the food bowl is a Thirst in the body-sense, too - it is the body that gets the benefit, both qualifying under 'Sense-Thirst'\(^\text{14}\), When it runs for dear life in the face of danger, it is clearly displaying its 'Thirst to be'. But as in the case of human beings, the 'Thirst to be' is inevitably conditioned by the 'Thirst to be not'. Keeping within the species itself, this could be understood as your pet poodle dying and being reborn into an animal life, dog or other\(^\text{15}\). At the cellular level, it

\(^\text{12}\) These are 'sense-thirst', 'Thirst to be' and 'Thirst to be not' (kāma taṇhā, bhava taṇhā, vibhava taṇhā respectively).

\(^\text{13}\) See Sheldrake, 2003, Part I in particular, for a study of telepathy in relation to humans and animals.

\(^\text{14}\) The first Noble Truth is dukkha 'suffering', and the second saṁudaya 'arising'. This arising is characterized in terms of a triple 'Thirst' (taṇhā – kāma-, bhava- and vibhava-). Kāma in kāma taṇhā is from the stem kam- 'to desire', and is associated with the senses.

\(^\text{15}\) ‘Few are those sentient beings that pass away from an animal life and are reborn among humans. More numerous are those reborn in the animal realm...’ (The Buddha in the Samyutta Nikaya, 120 (19)-125 (24)).
can be understood as energy at the given mindmoment (mm) of the dog's life coming to be, staying put and breaking up if only to show up at the next mindmoment.

Bee studies\textsuperscript{16} provide another example, where the entire community comes to be at the beck and call of the Queen Bee, showing not only their yearning for survival (i.e., 'Thirst to be' entailing of necessity the 'thirst to be not') but also upholding values such as loyalty and law and order, if still by way of survival, this exemplifying also their 'Sense-Thirst'.

Even the most basic forms of sentient life, such as sea anemone and volvox\textsuperscript{17}, can be said to share the features of the Triple Thirst, however rudimentary they may be in relation to the sentient being of the current phase of evolution, namely hominids. The cells of volvox, e.g., 'have eyespots', allowing them "to swim towards light"\textsuperscript{18}. If swimming suggests having 'swim limbs', and thus body-sense-based, swimming towards the light suggests both a 'Thirst to be' (survival) and 'Sense-Thirst' (satisfying the eye), both entailing 'Thirst to be not', mm to mm or over time or over life times. The volvox live in a colony, linking with each other, providing another instance of the Thirst to be and Sense-Thirst, just as we humans have a Sense-Thirst to be with our kith and kin.

So yes, the Thirsts are very much a part of non-human sentient beings as they are of human sentient beings, as captured in the Buddha's term satt\textacutesa, which is what allows us to claim that Thirsts constitute the inherited mentation of the Protosentient-complex, understanding 'inheriting' both in the Darwinian as well as the Buddha sense of Rebecoming (punabbhava).

"Except for altruistic behaviour and most aspects of parental behaviour, it is remarkable how many behaviour patterns seen in reptiles are also found in human beings," notes MacLean (in Restak, 1979:53). As our comparative study shows, this provides scientific evidence that confirms the Buddha's use of the term satt\textacutesa to mean both human and animal.

Further, notes Restak that the Protosentient-complex "may be part of a neural repository for behaviour that is specific for particular animal species". The Citta (C-complex), constituted of the Triple Thirsts and the Triple Blemish Roots\textsuperscript{19}, can, then, be said to be the psychological manifestation of that neural repository in relation to the human species (see Sugunasiri, forthcoming, for the argument).

But are we still not comparing apples and oranges? By 'evolutionary ancestors' Restak and MacLean mean the animal species alone (primarily the quadrupeds although bipeds like birds, multipeds like centipedes and nullipeds (to coin a term) like snakes\textsuperscript{20} are not excluded), while Buddhism is talking about a human sentient being coming to Rebecome. So where is the evolution?

Glad you asked. We have already seen part of the answer to this in noting the common terms satt\textacutesa used by the Buddha to include both human and animal. Now to add to it in evolutionary terms, it is precisely this very term 'sentient being' that allows humans to be strung along an evolutionary scale alongside animals. First, a given human individual, is a member of the human species which is an evolutionary product of a process, as well studied in

\textsuperscript{17} "The earliest 'chemical evidence of life' comes to be 3.8 bya [billions of years ago], and the earliest chemical evidence of Eukaryotes — an enormous group of organisms ... which include animals, plants, fungi and protozoans", 2.7 bya (Zimmer, 2001, 66).
\textsuperscript{18} <http://en.wikipedia.org/wiki/Volvox>.
\textsuperscript{19} These are r\textacutesaga, dosa, moha (Passion, Hatred and Ignorance).
\textsuperscript{20} This listing is inspired by 'Protection of Aggregates Discourse (khandhaparitta sutta, Anguttara Nikaya 4.67 (7)): 'my loving-kindness is for nullipeds, ... bipeds, ... quadrupeds [and] ... multipeds' (ap\textadakshehi me metta\textemdash / metta\textemdash dip\textadakshehi me / catuppadehi me metta\textemdash / metta\textemdash bahupadehi me).
Westernscience, that can be traced back to non-human ancestors. The evolutionary history of the species homo sapiens is traceable to the primates, the most recent branch off being from chimpanzees 5 mya, but with more recent ties to bonobos of 2-3 mya, with the oldest animals, ediacarans, being 575 mya. So regardless of whether a human sentient being has more than one Becoming and continues in "fellow traveling", this being the literal meaning of samsāra (< saṃ 'together' + sara- 'going, moving, following', 'flow' (PED)), the given sentient being, being a member of the human species, can be said to inherit from our evolutionary ancestors the psychological processes relating to the "ancient forms of Animal Mentation". They confer an evolutionary survival advantage. Now allowing for several re-Becomings, while each re-Becoming may bring fresh faces, alternately female and male, there are, among others, the Triple Thirsts and the Triple Blemish Roots, continuing from animal to human. Thus each sentient ‘face’, namely a new Rebecoming meaning a new Sentient Life, can be said to inherit the psychological processes, if only to be changed in a given lifetime, conditioned by the new realities of the new life. Incidentally, such psychological processes were seen by MacLean as being ‘unlearned’ and ‘pre-programmed’. But perhaps the innocent juxtaposition of terms seems to give an unintended contradiction. If it is pre-programmed, how could it be ‘unlearned’? From the Buddhist point of view, the processes are hardly unlearned. They are indeed pre-programmed and learned.

It is interesting that MacLean "has spent a lifetime searching for and describing 'paleopsychic processes'" (his term), "that refers to [these] ancient forms of Animal Mentation that we have inherited from our evolutionary ancestors" (Restak, 52) but without finding it. He was obviously not looking in the right place, namely, Buddhianscience! In the context of our exploration then, we can happily say, “Look no more. We have arrived”, and point to the relevant characteristics of sentience introduced by the Buddha. We could then say that the Triple Thirsts and the Triple Blemish Roots are what we humans have inherited from our reptilian ancestors.

6. Concluding Words

On the basis of the above then we could say that the Hypothesis has been confirmed. It also then justifies our title that the Triune Mind has found a home in the Triune Brain.

NOTE

This short paper is by way of an introduction to my forthcoming publication, tentatively titled, TRIUNE MIND, TRIUNE BRAIN: Map of the Mind through the eyes of Buddhianscience & Westernscience. This is a comparative study of the "Triune Mind in Buddhism" as proposed by me (Sugunasiri 2014) and the Triune Brain as proposed by Dr Paul McLean (McLean 1969; 1990). So what you’ll find in this paper are both concepts and excerpts. For the fuller treatment, readers are kindly and respectfully invited to read the forthcoming publication where you’ll find the topic discussed in areas such as, among others -

- the Buddhist concept of Stream of Consciousness in relation to a Neuron and the human ear;
- ‘Triune Brain’ in Westernscience explained in relation to the ‘Basic Structures of the Brain’.

21 See Zimmer, 2001, p. 70-71, for an evolutionary chart, covering a period from 4.55 bya (billion years ago) marking the ‘Formation of Earth’ to 150 kya when ‘anatomically modern humans arise in Africa, animal life (Edicarans) beginning in 575 marking the Cambrian Era.
The process of Rebecoming (more popularly, and erroneously, 'Rebirth') explained in scientific terms;

Mind In Embryonic Growth;

The Absent Brain (Matthalunga) in Buddhian Thought.

Thank you. Wishing you the best in health and happiness!

NEW TERMS INTRODUCED

Nullipeds; Neosentient; Paleosentient; Protosentient.

BIBLIOGRAPHY

Anguttara Nikāya, Pali Text Society.


http://www.kheper.net/topics/intelligence/MacLean.htm.


Samyutta Nikāya, Pali Text Society.


Sugunasiri, Suwanda H J, forthcoming, Triune Mind, Triune Brain: Map of the Mind through the eyes of Buddhianscience & Westernscience.


Author Bio

US Fulbright Scholar Suwanda H J Sugunasiri (BA (London), MA (Pennsylvania), MA, MEd, PhD (Toronto)), formerly of Trinity College, University of Toronto and Founding Editor, Canadian Journal of Buddhist Studies, is author of Dhamma Aboard Evolution: A Canonical Study of Aggañña Sutta in relation to Science. He may be contacted at suwanda.sugunasiri@utoronto.ca.