gitanjali and neuroscience

A connection between noble prize winning *Gitanjali*, the celebrated English collection of Tagore's poems, and neuroscience may at first seem far fetched. For "*Gitanjali*" literally means "song offerings," and the poems are suggestive of harmony, beauty and relationality at the least. Tagore, employing 12,091 words and a lexicon with slightly fewer than 2,468 word types,¹ renders in English what he had composed originally in Bengali for singing. The collection, consisting of 103 poems composed before 1910, translated in 1912 and published in 1913, won for him the Nobel Prize the very year of its publication. Neuroscience was still in its infancy then.

In 1906, Santiago Ramón Y Cajal won the Nobel Prize for discovering that neurons are discrete, unitary cellular entities of the central nervous system and form a network.² Further, they have gaps between them and interact by allowing information to flow across the gaps or synapses through dendrites to axons. By mid 20th century, the study of the nervous system was well on the way to becoming a scientific discipline, in large measure due to revolutionary developments in MRI technology, molecular biology, computer science, electrophysiology, and cognitive psychology. By the final decade of the last century, it had become interdisciplinary, having as allies behavioural and cultural studies, linguistics, and engineering, all in pursuing an explanation of how the network of neurons produces cognition and behaviour. Today, it has widened its collaborative scope to include medicine, physics, evolutionary theory, decision theory, communications and information sciences, and philosophy, thus becoming an interdisciplinary science. The widening has occasioned distinctions. One is between the Neuron Doctrine theory (associated with Cajal) and neuron doctrine as a philosophical stance. It is the latter that is more relevant to the underlying argument of this paper.

In short, explaining how the brain makes the mind has become one of the tasks of neural studies. How does the activity of discrete neurons achieve for us awareness, for example, experiencing gladness in the heart? Discoveries and answers coming from neuroscience quarters did not miss the attention of philosophers and theologians. Paul and Patricia Churchland³ had cut a hotly contested path by argu-

ing that empirical data for how the mind works was relevant to philosophers of mind. Theology also responded, but differently from the stance taken by eliminative materialists in philosophy, trying to uphold the idea of downward causality,⁴ through employing notions such as supervenience and emergence with respect to a theory of mind. At bottom, for humanist scholars at least, the question is that of how we seek to represent the truth about ourselves. Is modelling by cognitive science a direct representation of thought? That is, are cognitive tasks performed solely by neural mechanism? The questions and answers have led some to draw a distinction between being an individual or physical entity and a person in which the latter is understood as including mentation. It is at this point that a connection between *Gitanjali* and neural science no longer seems far fetched. The collected poems presuppose an idea of person for which scientific accounts do not provide the full story. Such is the argument underlying this short essay that considers the text with respect to certain words and their occurrences.

Gitanjali anticipates a view of person that is part of Tagore's universe of discourses and that some of his later prose writings⁵ sketch. It runs counter to naturalistic assumptions, thus challenging claims based on discoveries of electrical activities and the biochemistry of synaptic conduction that hold out the possibility to explain the full story of being a human person, or, more specifically, our experience of joy, mystery, and the transcendent in terms of the natural. Crucial to Tagore's view of becoming a person is a notion of limit or boundedness (Sanskrit/Bengali *sīmā*), the utmost limit or acme. It implies also the sense of a meeting point or reach. A sustained tenor by Tagore is that the finite becomes truly infinite by seeking its utmost to reach or touch the other side of its limits. Our personness is tied up with a longing to express not just what is on one side of the boundary or limit, but also that which is beyond our finiteness, to touching it. The striving to reach or touch "has a survival value and hence is a crucial factor in the workings of mind and consciousness."⁶ The self with which personness is tied-up has a superstructure that is essentially communicative, an ability that cannot not be validated or directly represented by neural network theories,

especially reductionistic ones purporting to provide an account of how brain makes the mind.

There is a two-fold reason for the insufficiency in validation by neural network theories. One is that the fully human person, for Tagore, stands at the cross roads of the finite and infinite, is truly fully human in journeying to that meeting point.⁷ The other involves the difficulty of explaining the higher by the lower, transcendence by the biological, especially when the former implies a discontinuity, and the later continuity.⁸ Alternatively, given that the emerging of mind from brain would involve combinations of interactions among very many neurons there is little hope in expecting fruitful results from neural network analytical methods. Yet, the practical difficulty of measuring and analysing the supercomplex neural interactions would hardly serve to deter from the quest. I would think too that for Tagore the urge of the neuroscience researcher to spin out different theories in light of new discoveries, to give a full account of the human person, may also be an expression of wanting to touch the other side of his/her limits or boundedness, an indication of a surplus within.⁹ To expand further on the two-fold reason would detract from the main purpose here, which is to show how the *Gitanjali* anticipates a view of the person as defined by boundedness in sustaining motifs such as joy, mystery, and kinship. I turn now to demonstrate, making use of some relevant word occurrences¹⁰ for three sense or meaning-related search terms: "bound," "limit," and "brink."

The *Gitanjali* poems show three occurrences for "bound," a search term that is a key in understanding personness. Lines with the occurrences in general convey the idea that becoming a person is bound-up with and to a transcendent power that limits or defines our existence and thus make us as individuals more than simply materiality. Each occurrence underscores slightly differently that very idea of personness. Poem 11,¹¹ for example, has the poet decrying escape from the limiting power that is responsible for his creation and instead taking delight in striving to remain in touch with it in daily life. With the search term put in bold italics, the lines read "Deliverance? Where is this deliverance to be found? Our master himself has joyfully taken upon him the bonds of creation; he

is **bound** to be with us all forever.... Meet him and stand by him in toil and in sweat of thy brow."

In another poem, decrying deliverance understood as the renunciation of the transcendent aspect of our human self, the poet praises the senses as a means of experiencing the delights that transcendence as a limiting power offers. Our natural or finite side as persons is the very conduit for experiencing the infinite or transcendent dimension to which we are bound. Poem 73 reads:

Deliverance is not for me in renunciation. I feel the embrace of freedom in a thousand bonds of delight. Though ever pourest for me the fresh draught of thy wine of various colours and fragrance, filling this earthen vessel to the brim.... No, I will never shout the door of my senses. The delights of sight and hearing and touch will bear thy delight. Yet all my illusions will burn into illumination of joy, and all my desires ripen into fruits of love.

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References

1. Statistics, word counts and frequency lists with each word linked to a concordance are provided by IntraText website, http://www.intratext.com/IXT/ENG0230/_INDEX.HTM, accessed July 21, 2011. A caveat is that the Intratext count includes Yeat's introduction to the *Gitanjali*, and title. On my tally using a word processor count program, the poems consist of 12,091 words or tokens, excluding the introduction that is another 2358 words, and that together totals 14,449 words (tokens). The latter total is 42 fewer than the IntraText count that includes headers and footers. Another point to note is that my cited word type count of 2,468 is reported by IntraText as word tokens. It simply cannot be so, given that token count is all words, including repetitions, of a text, compared to type count which is all lexically different words. Still further, the total word types in Tagore's lexicon has to be considered as slightly fewer than 2468, given that the IntraText count includes the introduction and that Yeats made slight emendations to some of the poems.
2. For a brief history see "Milestones in Neuroscience," at <http://faculty.washington.edu/chudler/hist.html> accessed on July 18, 2011, and "History of Neuroscience," at <http://www.columbia.edu/cu/psychology/courses/1010/mangels/neuro/history/history.html>, accessed also on July 18, 2011. See also William R Uttal, *Neural Theories of Mind* (Mahwah, New Jersey: Laurence Erlbaum Associates, 2005), pp 98–95, and 154–159 for a distinction between the Neuron Doctrine (associated with Cajal) and later distinctions between it and a single neuron theory on one hand, neuron doctrine as a philosophical stance on the other.
3. In particular see Patricia Churchland, *Neurophilosophy: Toward a Unified Science of the Mind-Brain* (Cambridge, Massachusetts: The MIT Press, 1986) and *Brain-Wise: Studies in Neurophysiology* (Cambridge, Massachusetts: The MIT Press, 2002).
4. Within theological circles the work by Nancy Murphy and Philip Clayton readily comes to mind. The relevance of their work and that of other scholars as to whether persons are more than brain states and neurochemical reactions, is discussed by James W. Jones, "Brain, Mind and Spirit – A Clinician's Perspective or Why I am not Afraid of Dualism," in *Soul, Psyche, Brain: New Directions in the Study of Religion and Brain-Mind Science*, edited by Kelly Bulkeley (NY: Palgrave Macmillan, 2005), pp. 39-53. In the same volume essays by Kelly Bulkeley and by Jeremy Carrette, chapters 10 and 11 respectively, are well worth reading on attempts to overcome the conflict between absolutist positions in both the study of religion and neurological studies. Outside of theological circles, on the difficulty of explaining how the mind is produced by the brain see Uttal, *Neural Theories of Mind* especially chapter 3.
5. As to where and how it is sketched, see my discussion, Abraham H. Khan, "Person and Boundedness in Wittgenstein and Tagore: Positioning Artificial Intelligence, in *On Mind and Consciousness* (Shimla: Institute for Advanced Study, 2003), especially pp. 309-313.
6. *Ibid.*, p. 303.
7. See essay on art in Rabindranath Tagore, *Personality* (Calcutta: MacMillan, 1917, rpt. 1970), pp. 3f
8. For more information in support of this line of reasoning see discussion by James W. Jones, "Brain, Mind and Spirit," *op. cit.*, p. 42f. In short, spirituality requires discontinuity and relies on the category of supervenience to provide in order to make sense of downward causality and avoid a hard reductionism. Science, however, relies on the category of monism to provide for it the sense of continuity for its validation. Tagore, in his lecture "The World of Personality," notes this point of sameness or continuity with respect to science. See his *Personality*, *op. cit.*, p. 54, and notes further that the infinite assuming finitude is a paradox that is age old, lying at the root of human existence, p. 55.
9. See essay "The Surplus in Man," in Rabindranath Tagore, *The Religion of Man* (Boston: Bacon Press, 1931), chapter 3.
10. In computing literary texts, relative frequencies and not the raw occurrences of words determine significance. To establish relative frequency requires the word count of a larger body of texts or corpus of the author, and the raw occurrence for each word in the corpus, to serve as a standard. Though such a standard is lacking here we can still make some progress by the looking at the raw occurrences, which are relatively few for the words/terms selected in this study, making use of the concordance by IntraText website, as cited above in note 1, to locate them in the text.
11. The numbering of the poems and lines cited are in accord with *Gitanjali* (New Delhi: Wisdom Tree, 2007)