<u>The Self and the Soul: Brains, Selves and Souls</u>

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Traditions which distinguish souls and selves, like Christianity, typically view the self as imperfect, doomed to dissolution, and the soul as nonmaterial, immortal and purified of bodily corruption. Both concepts serve numerous purposes for their users. Two are particularly relevant to neuroscience:

1) souls and selves express the richness and value of personhood, the sense that human beings are more than just animate lumps of meat.
2) souls, unlike selves, offer the hope of life after death.

Neuroscientists assume that whatever makes us us derives from an embodied functioning nervous system (FNS) interacting with an environment. Remove any of the three components – FNS, body, or environment – and it becomes unclear how anything approaching a person could develop. Since brains and bodies cease to function at death, neuroscience struggles with the idea of an immortal soul, unless death precedes some form of re-embodiment.

Mortal selves, seen as graded and composite, are more palatable. Conceived of in narrowly cognitive terms as neurally-processed information (stored in the FNS by networks of nerve cells communicating via synapses), they were localised to prefrontal areas of the brain, areas associated with 'high-level' functions like rationality. As neuroscience shook off cognitivism, however, it recognised the importance of other regions: parietal cortex for integrating body-knowledge, the cingulate, linked to emotion processing, motor areas, etc. Embodiment, emotion and agency, as much as rationality, appear to underpin the development and maintenance of selves.

To simplify: three main concepts of self emerge from brain research. The (self)conscious 'I' is a gradually developing representation of an individual agent, differentiated by awareness of and partial control over sensory input, cognitions and emotions, and by the capacity to initiate action. The 'current self' is broader, locating

selfhood not just in a specific 'I'-representation, but in all active neuronal networks. This in turn can be extended to the totality of synapses within an FNS (the 'synaptic self'). Recently social neuroscience has begun to acknowledge how deeply selves are embedded in belief systems – ideologies, religions, cultures – and within relational networks. (Here the theological concept of personhood is relevant.) Neuroscientists would maintain, however, that all such relationships are mediated via changes in how neurons communicate. This may seem reductive, but it actually enriches our understanding, in that nervous systems respond to many factors whose effects on our selves we may not normally notice: immune and hormonal changes, light levels, etc.

Perhaps neuroscience could accept the soul by conceptualising it as an ideal or potential self: the kind of person, given a particular allocation of DNA, who would result from an embodied FNS developing under optimal social and physical conditions. Whether such conditions exist, and if so what they are and whether it is useful to specify them, are fascinating questions for neuroscientists, and an example of how they can learn from other disciplines – such as theology, philosophy and anthropology – to strengthen core concepts.

Reciprocally, neuroscience's focus on embodiment, emotion, agency and development may have much to offer beyond its boundaries, enriching as well as constraining possibilities.