Genetic memory: The Scientific Basis for Past Life Regression?

Strange fact number 1: Scientists trained flat worms to curl up when exposed to light by electrocuting them every time the light was turned on. A pure Pavlovian, conditioned response. Even more unfortunate for the flat worms is their ability to regenerate themselves if cut in half . An amazing thing in itself; cut them in half and the head end grows a new tail and the tail end grows a new head. When the scientists did just that they found something bizarre; when exposed to light both versions of the worm responded according to the conditioning. How can this be? Common sense and contempory neuroscience both agree that memory is contained in the brain, so how can a newly grown brain come complete with memories?

Strange fact number 2: Take a calf born of stock that is used to cattle grids but has never seen one itself and introduce it to lines painted on a road to resemble a grid. It will not cross. How has this knowledge been communicated?

Strange fact number 3: A new -born chick is placed in a room with a hawk. It frantically tries to find cover. It meets a chicken for the very first time and is completely comfortable. People would call this instinct, and I'm sure it is –but how is instinct passed from one generation to the next? Wouldn't it have to be stored in the DNA? And instinct is just a form of memory, so if that form of memory is stored in the DNA, then why not other forms of memory. It would explain facts 1–3 wouldn't it?

The idea that our memories are stored in our genes is a very recent and controversial one. It has been accepted since the experiments of Wilder Penfield back in the fifties, that hidden away in each of us is a permanent record of our past. We are reminded of it regularly; how many times have you smelt a particular smell or heard a particular song, and been instantly transported back to an intense childhood memory. However, most neuroscientists believed and continue to believe that long-term memories are built into the brain by creating and strengthening connections between neighbouring neurons. These connections, known as synapses, are thought to join neurons up into complex networks that can recreate specific patterns of brain activity (memories), days, weeks, or even years, later.

There are problems with this model. These connections would need to be permanent and stable, and the brain is not. Nearly all the brain's molecules, including those that form the neural connections thought to be involved in memory, are replaced every few weeks. How long-lasting memories can be stored by such an impermanent medium has confounded neuroscience for years. It is like writing a message on a piece of paper. Suppose we could replace the paper one molecule at a time. Eventually we would have a completely new piece of paper, with exactly the same appearance – except it would not still have the message written on it. Neurobiologist Sandra Pena de Ortiz suggests that somehow the brain must retain an archived blueprint of each neural network in order to create the replacement neuron as a structural

and functional clone of its predecessor. Nature's blueprint of choice is, of course, DNA, and it has the advantage of not undergoing the turnover that other molecules do. Not only is it quite stable over time, it even has a repair facility if anything goes wrong.

Pena believes that permanent memories are stored in altered genes. She and her colleagues believe that our DNA creates 'memory molecules,' new novel proteins, from a unique blueprint that could be formed by neurons rearranging their DNA in response to each new experience. The unique structure of these memory molecules would enable them to snap into a specific position at the synapses, helping make memories stable without disturbing other synaptic structures. "Changes in synaptic connections wouldn't remain intact for long, but gene rearrangements could be kept throughout the neuron's life.

Some scientists go even further and suggest that these memory molecules might store information themselves, that each individual neuron contains memory.

Either way this is a radical concept because the usual concept of our genetic code is of something fixed at the beginning of our lives, not something that gets re-written on a daily basis, and certainly not every brain cell being allowed to tamper with that code. But looking at it from an evolutionary point of view this arrangement does fulfil an abiding principle – that of Occam's razor.

Occam's razor states that nature always reduces things to the simplest solution. We know of only three 'memory systems in nature. There is the evolutionary memory of how to build an organism; a cognitive memory of events we experience; and an immune memory of past infections. Two out of three of these are based on DNA, we would normally expect nature to be efficient enough to use the same tools for the third as well, not evolve something unique.

The impact of this theory, if true, is that our identity, our self, leaves a permanent mark on our genome. We may pass onto our descendents much more than eye colour. It has already been estimated that perhaps 40% of known personality traits are inherited, such as introversion/extraversion. This theory could explain how. It also poses other intriguing questions for our field.

Carl Jung popularised the idea of a collective unconscious that we are all plugged into, and suggested it as the repository of racial memories and universal archetypes. With genetic research now proving the inter-relatedness of all racial branches of the humanity – we are all related at some point in the past with Caesar, Sitting Bull, Nelson Mandela, Confucius and Uncle Tom Cobbly – the genetic transmission of memory would be a sensible transport mechanism for Jung's theory. And of course we can get crazier:

If memories are stored in our DNA (and as 97% of it has no obvious function there is plenty of room), and we pass on our DNA to our children, who do the same thing with their children, could this be how the instincts of the chick and calf were passed on? If memory is stored in the genes is that how the flat worm's tail can grow a new brain with an old memory? And finally, if they have access to instinctive memory (as we do - think of the grip response in a child when it thinks it's being dropped), is it possible to access other ancestral memories located in our DNA? Could this be an explanation for past-life regression? When clients regress to memories from a previous life, is it actually them accessing something present in their genome blueprint, an ancestral experience?

It is the case that the mind uses past experiences as references to decide the meaning of what is occurring in the present. In the main we are used to thinking of such past experiences being limited to this lifetime. Perhaps the unconscious has access to reference experiences stretching back generations. Certainly many people who experience such memories under hypnosis find an answer to a present problem. This would be consistent with the theory predicting that the effects of our experiences would be expressed in our genome. If this is inherited by our successors then it would also suggest that they would be subject to the consequences of those experiences.
Past life regression having a basis in science, whoever would have though it?

Recent research by Elizabeth Young of Princeton University has overturned another scientific sacred cow. The accepted view has been that we are born with a massive over-supply of brain cells. As we adapt to our environment brain cells that are stimulated by our experiences are strengthened, and those which are not required atrophy. A little like paratroopers dropped into hostile territory, we are issued with a range of equipment to cope with what we might find. As we explore the terrain, any equipment that is surplus to requirement is discarded. So far so true. However, it was also held that we cannot create new brain cells, the paratrooper cannot re-arm once they have been dropped. Elizabeth Young has now proved other wise. Brains do indeed grow new brain cells in response to new learning experiences.