Case 4 - Talking Pigs

The neuroscientist V. S. Ramachandran (along with S. Blakeslee) opened the book *Phantoms of the Brain* with an example intended to counter the bias in favor of statistically-supported phenomena. There it was pointed that if someone could demonstrate a single talking pig that would be very significant (and to hell with statistics). Here I briefly consider some talking pigs that some scientists must be aware of but apparently neglect.

As a lead-in imagine that someone tells of a young man capable of running a 4 minute mile. If you follow track at all this not noteworthy. Then they mention that this guy did it without any training. Now the speaker has your attention. Before you have a chance to respond they go on to point out the runner did that 4 minute mile without even breathing hard! Now you have to respond perhaps by exclaiming "That is impossible!".

Now change venues from running to remembering (where the underlying strengthening is presumably carried out amidst neural connections - not muscles). Imagine someone telling you of an individual who can pretty much remember the events of their lives - both personal and reported major news - on a daily basis. That is specifically you could give them a date during their lifetime and they could then tell you their significant activities on that day as well as any major news events that also happened. If that weren't impressive enough this memory-gifted individual can also give you the corresponding day of the week! At his point you would probably be very impressed but perhaps upon reflection you might think that this individual has a better than average memory and in fact long ago they decided to pursue this memory-based diary business as sort of a pride-based super-hobby. You also might think that this expression of memory is analogous to a 4 minute-miler (although on further thought you might reflect on the tasks of acquiring and then maintaining so much information as more akin to running a 4 minute mile while wearing a backpack!). Anyway, thus you might conclude amazing but seemingly possible.

Then your speaker really gets your attention by pointing out that such memories are known amongst a number of people (and sometimes called hyperthymesic syndrome) and that they apparently involve no directed effort! At this point you might well have explained "Impossible!".

In fact a February 2014 *Scientific American* article entitled "Remembrance of All Things Past" considered this phenomenon amongst about 50 people (and in so doing perhaps gave an official Science- or Neuroscience-certification to the phenomena). One person highlighted was Jill Price who the authors extensively tested for her recall of events and that memory was eventually proved faulty in one case - the day of the week of one of the previous 23 Easters. Along

the way she "corrected the book of milestones for the date of the start of the Iran hostage crisis at the U.S. embassy in 1979". Also during tests of less significant dates Price:

> correctly recalled that Bing Crosby died at a golf course in Spain on October 14, 1977. When asked how she knew, she replied that when she was 11 years old, she heard the announcement of Crosby's death over the car radio when her mother was driving her to a soccer game.

She demonstrated an "immediate recall of the day of the week for any date in her life after she was about 11 years old" (her diary-like memory appeared at that age). Yet she "has trouble remembering which of her keys go into which lock" and "does not excel in memorizing facts by rote". The remainder of McGaugh and LePort's article chronicled their subsequent confirmation of similar extraordinary memories in about 50 people. Such memories were found to be "highly organized in that they are associated with a particular day and date" and that it occurred "naturally and without exertion".

The authors discussed possible neural correlates and even a possible evolutionary basis. This was done in appropriately tentative fashion as these phenomena are far beyond current understanding. There is also some overlap here with some of the phenomenal memories demonstrated by savants and also in the acquired savant phenomena. There is also conceptual overlap with the extraordinary biographical memories reported in some near-death experiences. Missing in the article was an underlying sense of the extraordinary challenge offered to brain/neural-only reasoning. This phenomena is also considered in my "A Hole in Science" book.

Continuing on that point, for sometime now it has been apparent that some individuals can function very well despite having little brain tissue. As a result of the condition hydrocephalus, some people have had their brain's cerebrospinal fluid reservoirs (or ventricles) enlarge enormously and thus displace or destroy other brain tissues. In a 1980 *Science* article, "Is Your Brain Really Necessary?", some relevant findings on this condition by British neurologist John Lorber were considered. In breaking down over 600 scans of patients with spina bifida (most of whom also had hydrocephalus) into categories based on the fraction of the cranium (braincase) occupied by cerebrospinal fluid, of note were the scans in which "ventricle expansion fill[ed] 95 percent of the cranium". This category included "less than 10 percent" of the 600-plus patients. Within this category it was noted that "many" of these affected individuals were:

> severely disabled, but half of them have IQ's greater than 100. This group provide[d] some of the most dramatic examples of apparent normal function against all odds.

One particularly dramatic example was described in a quote by Lorber:

> [t]here is a young student at [Sheffield University] who has an IQ of 126, has gained a first-class honors degree in mathematics, and is socially completely normal. And yet the boy has virtually no brain.

What do neuroscientists think that they will find at some future neural-imaging facility when examining an individual like this? Readers might try viewing this phenomenon from an analogous athletic perspective (as was used earlier here).

Additional observations of Lorber pertained to a subgroup of patients for whom their ventricle expansion had been limited to one side of the brain. Lorber pointed out that:

> I've now seen more than 50 cases of [such] asymmetrical hydrocephalus and the interesting thing is that only a minority of these individuals show the expected and long-cherished neurological finding of paralysis with spasticity on the opposite side of the body.

Lorber then went on to point out that one of these patients displayed spastic paralysis on the *same* side as their "enormously enlarged ventricles". Why haven't such findings found their way into the big ongoing neuroscience coverage? Why didn't Darold Treffert discuss these findings as a counterpoint to his brain abnormalities-based explanation of savant behaviors? Why didn't Sam Harris include such examples as a counterpoint to his 'how-could-you-possibly-think-that-the-brain-doesn't-cover-all-phenomenological-bases' arguments?