The Neurology of ‘Alice’

The Reverend Charles Lutwidge Dodgson (1832-1898) has been immortalised as Lewis Carroll, the pseudonym under which he published a number of books, amongst them the two classics Alice’s Adventures in Wonderland (1865) and Through the looking-glass and what Alice found there (1872). These works have been of interest not only to children of all ages but also to neurologists since some of the phenomena they describe, or seem to describe, may be deemed suggestive of neurological conditions, a subject which has been previously discussed.1

“Alice in Wonderland” syndrome

The name “Alice in Wonderland” syndrome was coined by Todd in 1955 to describe the phenomena of micro- or macrosomatognosia,2 i.e. altered perceptions of body image, which had first been described by Lippman in the context of migraine some years earlier.3 It has subsequently been suggested that Dodgson’s own experience of migraine, recorded in his diaries, may have given rise to his descriptions of Alice’s changes in body form, so graphically illustrated in Alice’s Adventures in Wonderland by Sir John Tenniel. These have been interpreted as somesthetic migrainous auras.5 However, Blau has challenged this interpretation on chronological grounds, finding no evidence in Dodgson’s diaries for the onset of migraine until after he had written the Alice books.6 Moreover, migraine with somatosensory phenomena they describe, or seem to describe, may be deemed suggestive of neurological conditions, a subject which has been previously discussed.1

“Mad Hatter syndrome”

The consequences of poisoning with inorganic mercury include a mild sensorimotor peripheral neuropathy, a syndrome which may resemble motor neurone disease, tremor (often circumoral), stomatitis, skin rash, and a neuropsychiatric syndrome characterised by timidity, slowness of speech, and mood lability (erethism). Hatters were liable to such problems because of the use of mercury in the felt hat industry as a stiffener of rabbit fur, leading to the expression “as mad as a hatter”. Hence it might be assumed that Carroll’s Mad Hatter is “mad” because of mercury exposure.4,12 However, as Waldrom pointed out,14 odd though his behaviour certainly is, the Mad Hatter displays none of the typical features of mercury poisoning, either at the mad tea party (Alice’s Adventures in Wonderland, chapter 7), or during his appearance as the King’s Messenger Hatta in Through the looking-glass (chapters 5 & 7). Tenniel’s illustration of the Mad Hatter/Hatta is said to resemble one Theophilus Carter, a furniture dealer near Oxford, who was known to Dodgson, and known in the locality as the Mad Hatter because he always wore a top hat and was prone to eccentric ideas.14,15

Prosopagnosia

Humpty Dumpty, encountered in Through the looking-glass (chapter 6), is one of Carroll’s most enduring characters, remembered principally for his famous definition of the meaning of a word (“just what I choose it to mean”), and his coining of the term “portmanteau word” (“two meanings packed up into one word”).

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A re-reading of the encounter between Humpty Dumpty and Alice indicates two passages alluding to facial recognition: initially when Alice makes out that the egg has the face of Humpty Dumpty, and then at parting when Humpty Dumpty says he would not be able to recognise Alice if they did meet again: “Your face is the same as everybody has”. On the basis of this latter passage it has been suggested that Humpty Dumpty may suffer from prosopagnosia, a rare form of visual agnosia characterised by impaired recognition of familiar faces or equivalent stimuli.17 Sadly this hypothesis is not amenable to empirical investigation since Humpty Dumpty apparently suffered irreversible traumatic injuries in falling from a wall, thereby confounding any further assessment.

Questions for future study?
In *Alice’s Adventures in Wonderland*, is the Pool of Tears (chapter 2) a consequence of pathological crying? At the mad tea party (chapter 7), does the dormouse suffer from excessive daytime somnolence, and if so is there an underlying neurological cause? Does the very ugly Duchess (chapters 6 & 9) have a dysmorphic syndrome, perhaps with behavioural features to explain her neglectful treatment of her baby?

In *Through the looking-glass*, The Red King (chapter 4) and both the White and Red Queens (chapter 9) snore whilst they are sleeping: might they have obstructive sleep apnoea-hypopnoea syndrome? Does the White Queen’s statement that she “can’t do subtraction under any circumstances” (chapter 9) reflect a selective acalculia?