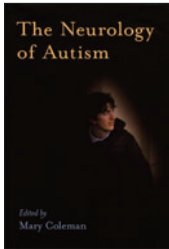


Differently wired



The Neurology of Autism **Edited by Mary Coleman**

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Reviewed by Simon Baron-Cohen

Mary Coleman was one of the pioneers in establishing autism as a neurodevelopmental condition—through her early 1970s work measuring neurotransmitters such as serotonin and detecting elevated levels of it in a significant subgroup of children with autism. She was pioneering because the essential characteristics of autism are difficulties in social interaction and communication and the presence of strong, narrow interests or ‘obsessions’—behaviors that, on the face of it, might be expected to have at best remote connections to biochemistry. She was pioneering particularly given the history of the field, which had (mistakenly) attributed such behavioral differences purely to emotional and parenting factors. Her early intuitions that autism was, at root, neurological have been proven right over and over again.

In her new book, Coleman shows her remarkable ability to summarize findings from the fields of genetics, neuropathology, neurochemistry and embryology as they relate to autism. Her chapters in this edited book are among the best reviews I have read on these subjects. Her style is a mix of the historical and the technical, and her masterly reviews are up to date, replete with detail and yet eminently readable.

An example is how she tells the story of Dr. John Langdon Down who, in 1866, published a paper arguing that children classified as ‘idiots’ and who had enlarged tongues fell into two subgroups: ‘mongolism’ (a name he chose because of the children’s eyelids) and ‘cretinism’ (today known as infant hypothyroidism). This marked the historical beginning of scientific classification and study of ‘mental retardation’ syndromes and, argues Coleman, ushered in a new era of medical interest in, and humane care of, these children.

Coleman now adopts the role of a modern Dr. Down, describing in engaging detail numerous subgroups within the category called autism. Some of these subgroups are characterized by mutations in genomic and mitochondrial DNA. Other subgroups of autism are characterized by specific anomalies of neural structure and function, detectable either at postmortem examination or through the use of magnetic resonance imaging (MRI). To complement her own reviews, Coleman invited a series of excellent expert contributors to provide chapters ranging from a survey of cerebellar dysfunction to an essay evaluating the enlarged cranial circumference in autism.

She concludes that autism is “a final common pathway of many, many different diseases, each of which may require its own medical therapy.” This is a welcome statement in that it dissects autism into subtypes in order to spur scientific progress; but it is also a tell-tale sign that her model of autism is one of disease rather than of atypical brain development. It is this somewhat antiquated view that is, for me, the only weakness of the book. She talks, for example, of “neurodevelopmental missteps” (p. 5) and of minor to major “physical stigmata” (p. 5). Although I do not dispute that the classic ‘low-functioning’ child with autism—who has no language, has a low IQ, is prone to self-injury and has epilepsy—fits this ‘disease’ model, the real challenge today is to provide a model that encompasses the whole autistic spectrum.

This spectrum includes individuals with Asperger syndrome, who share with classic autism the social difficulties and strong narrow interests, but who have average or even above average IQ, good language ability and no trace of epilepsy. They may even have no “stigmata.” Coleman (to my mind) inappropriately extends the disease model to this subgroup. She writes: “Where does one draw the line between an eccentric or odd person and a truly sick person?” (p. 12). In this quotation, she is rightly asking how one distinguishes Asperger syndrome from what is sometimes called the ‘broader phenotype’ or even simply from patterns of characteristics that are normally distributed throughout the population. She appropriately wants to restrict the diagnosis of Asperger syndrome to those who have a real medical condition. But to describe those who have an appropriate diagnosis of Asperger syndrome as “truly sick” risks offending such individuals.

People with Asperger syndrome want to be recognized as having atypical neural development and atypical neurocognitive processing and to contrast themselves from “neurotypical” individuals. Their model is a difference model. By analogy, right and left handers are different, and left-handedness is no longer viewed as a disease. Asperger syndrome results in some cognitive deficits, such as those in gestalt processing (the rapid perception of the larger picture) or empathy. But it also comes with specific cognitive talents: for example, in attention to detail and in ‘systemizing’. Neurotypical individuals possess the opposite profile. Neither, we could argue, is diseased; they are simply different.

Asperger syndrome is diagnosed among individuals who have achieved high levels of functioning in some areas (for example, mathematics) and yet manifest major social difficulties. Increasingly, such individuals are saying they need support in some areas but that in other ways, they ask to be respected for simply being differently wired.

In the end, this is a minor point of style in Coleman’s writing that harks back to the immensely valuable decision she made in the 1970s to study autism in just the same way as one studies any other neurological condition. This approach has provided untold benefits, ushering in decades of biomedical research in a field that was previously the province of psychoanalysis, or psychology, alone. The neurogenetics she reviews in this outstanding book is as relevant to the high-functioning individuals with Asperger syndrome as to the lower-functioning individuals with classic autism. Coleman’s new book is an absolute must-read for anyone interested in the progress made in understanding the causes of autism. The field owes her a tribute worthy of someone who has transformed an area of neuroscience.

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