Please send suggested books for review as well as reviews of books, articles of aeromedical interest, films, websites, etc. to Geff McCarthy, M.D., geffandjulie@comcast.net

Reviews

Stepaniak C, Lane H. ***Loss of Signal, Aeromedical Lessons Learned from the STS-107 Columbia Space Shuttle Mishap.*** NASA 2014; 166 pp. U.S. Government Printing Office, bookstore.gpo.gov. Free download from AsMA web site or http://ston.jsc.nasa.gov/collections/TRS/listfiles.cgi?DOC=SP-2014-616.

From the early days of charting unknown oceans and wild lands to the initial efforts to venture off the surface of our planet, exploration has been a dangerous undertaking. Technical advances and risk mitigation processes have not spared space exploration its share of disasters. We discovered early in aviation history that investigating and analyzing mishaps is necessary to mitigate risk on future missions.

Loss of Signal is the chronicle of the medical investigation following the loss of space shuttle Columbia during atmospheric reentry on 1 February 2003. The title refers to 08:59:32 CST when the last telemetry was received from the orbiter, signaling the time of catastrophic loss of the vehicle and the international crew of seven. This report is made personal as it is told by members of the response teams.

The response to the Columbia mishap was unique as there had never before been a mishap at such extreme altitude and velocity. The resulting debris path was over 400 km long and 50 km wide and required a recovery effort on an unprecedented scale. The report details not only the extensive mishap response, but the planning that took place in the years before. Like any plan, there were issues that needed to be changed real time and we see how the teams dealt with these challenges.

While giving a thorough treatment of the investigation process, the story is made even more poignant as many members of the team had worked intimately with the crew prior to the mission. A major stand-out in the narrative is the respect for fallen colleagues from the identification of potential remains to the final disposition. The cross-cultural issues were especially important in the way the remains were handled.

While the personal details make this document stand out from other mishap reports, there is no lack of technical details. Section 4, The Analysis, gives details of the timeline and attitudes of the spacecraft throughout the reentry. It correlates the crew injury patterns with the events to reconstruct the mechanisms of injury. This analysis is followed in Section 5, The Future, by combining the Columbia mishap investigation results with results of other aviation and space mishaps to move forward with recommendations for future investigations and improve crew protection.

Spaceflight will always have an element of risk. As access to space expands to more government and private agencies, it is probable that further mishaps will occur. For aerospace medicine professionals, I would recommend keeping this book at hand when developing mishap response plans to prepare for that day we hope never comes.

Reviewed by
Geoffrey W. McCarthy, M.D.

DOI: 10.3357/AMHP.4202.2015

Churchland P. ***Touching a Nerve.*** WW Norton Co., NY, USA; 2013. 267 pp, $17 from on-line sellers.

This book provides insights into an approach to philosophy that incorporates the findings from neuroscience called neurophilosophy. Publication of Churchland's *Neurophilosophy*[1] in 1986 serves as one of the foundations. Her goal was to use empirical findings from the neurosciences concerning how the brain works to expand our understanding of the philosophy of the mind. This approach, called eliminative materialism, argues that the typical way in which we describe someone's behavior as due to a belief, desire, love, or free will is false, that these mental states do not exist. In the future the manner in which we describe our behavior or experience will be judged by how well they can be explained at a biological level.

The above concern is evident in the following quote: "Each of us thinks we know ourselves better than anyone else can know us. But if the unconscious brain is a major factor in what we think at this very moment and what we feel at this very moment, the ground under our feet may seem to be falling away" (p.13). The manner in which the findings of neuroscience can challenge our understanding is readily apparent in the following chapters: Soul searching; My Heavens; The Brains Behind Morality; Aggression and Sex; Such a Lovely War; and Free Will, Habits, and Self-Control. As

the author develops her ideas she focuses on our brain and recent research in the neurosciences to challenge traditional thinking. Along with frequent descriptions from her experiences growing up in a small rural community in British Columbia, she uses a number of figures and schematics to demonstrate how brain structures and certain neural pathways play a role in our thoughts and behavior. The presentation also includes information concerning the effects of evolutionary processes on genes as well as the role of neurotransmitters and peptides.

She is critical of the dualistic (mind/body) position and clearly demonstrates how typical philosophical approaches to discussions of the soul, heaven, and morality are flawed when viewed in the light of our existing knowledge of brain sciences. An example is her comment regarding Descarte's dualism: "This suggests that soul theory is floundering because there is no soul" (p. 53). To her, so-called after-death or near-death experiences are insufficient evidence of the existence of heaven.

When discussing morality she uses information regarding the evolution of the brain, hormones, and the peptides oxytocin and vasopressin to explain how family caring develops. Caring, recognition of other's psychological states, learning social practices, and problem solving in a social context are what she feels are the interlocking brain processes that serve as the basis for moral norms. While there is some overlap, this approach is less complex than Haidt's[2] view that moral foundations are based on care/harm, liberty/oppression, fairness/cheating, loyalty/betrayal, authority/subversion, and sanctity/degradation. Churchland is critical of Haidt's[2] work that suggests that genes play a role in whether people become liberal or conservative. Haidt feels that in an individual's brain, where genes gain pleasure from novelty, variety, and diversity, and at the same time are less sensitive to threat, they have a predisposition to become liberals. Conservatives have brains where the genes have opposite settings.

This is a very readable book and serves to challenge many of the ways in which we typically describe our self and our free will. We often are unaware of the extent to which unconscious processes predispose us to respond to certain events or individuals.

Reviewed by
David J. Dean Schroeder, Ph.D.

REFERENCES

1. Churchland PS. Neurophilosophy: toward a unified science of the mind-brain. Cambridge (MA): MIT Press; 1986.
2. Haidt J. The righteous mind: why good people are divided by politics and religion. New York: Vintage Books; 2013.

DOI: 10.3357/AMHP.4205.2015