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*Book Review*

# Controversies in medicine and neuroscience: Through the prism of history, neurobiology, and bioethics

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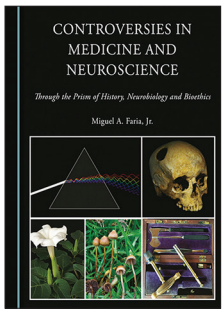


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The author is a neurosurgeon, neuroscientist, historian, political analyst, and editor of multiple journals. Despite all of this, he makes himself readily accessible to the general public through his website and Facebook page, both of which he maintains with impressive professional decorum. His latest book, ***Controversies in Medicine and Neuroscience: Through the Prism of History, Neurobiology, and Bioethics*** (Cambridge Scholars Publishing) is just one more absolute masterpiece that I recommend to any medical professional; MD, PhD, RN, PT, etc. This reviewer already shares his ideology, but perhaps those in opposition might see it differently. He makes his case on many currently volatile topics with grace and great persuasion. The author also does not talk down to his readers. Readers do not need any advanced degrees to understand exactly what point he is making.

The book is divided into 27 chapters, all of which treat issues in neurology, neurosurgery, psychiatry, general medicine, medical politics, and medical history. All of these issues are still under debate, but what divides them is their current state of practical versus academic importance. It will ultimately be up to the individual reader's taste which of these 27 chapters they will be most inclined to read. This is the type of book I personally prefer, because the chapters may be read out of sequence, since no chapter is dependent on knowledge of the previous ones to understand it. I picked my favorite topics to read first. ***Controversies in Medicine and Neuroscience: Through the Prism of History, Neurobiology, and Bioethics*** contains 27 chapters that may be somewhat arbitrarily divided into several distinct current and historical medical and scientific issues. The only caveat here is that while one may skip around to find chapters that are of the most interest to them, the book is divided into several main themes, which means a reader should at least study all the chapters that fall under the same theme as the one they originally picked to read.

What follows is my own arbitrary division of chapters with some commentary on those I have a personal interest in. For some chapters, I present a point of view that is in line with the author. For others, I present a view contradicting him on certain issues.

Chapters 1–7 are concerned with neuropsychiatric and psychobiological (functional and organic) as a neurosurgeon might see them. The book also discusses the neurobiological basis of learning and memory, which this reviewer can completely relate to, since that was my concentration as a doctoral student in behavioral neuroscience.[6] Eric Kandel's famous 1970 series of Aplysia papers, which is discussed in this book, are required reading for any graduate student in neuroscience or biological psychology.[5] There are those who would say that if you do not own a copy of Kandel's ***Principles of Neural Science*** you can't be a neuroscientist!

In Chapter 7, ***Controversies in Medicine and Neuroscience*** describes several fascinating syndromes. I found the Gastaut-Geschwind Syndrome's constellation of symptoms most intriguing. The author writes:

(This syndrome consists of) ***… "hyperreligiosity, hypergraphia, exaggerated philosophical concerns," etc., which may alternate with periods of irritability and elation. These symptoms typically occur in interictal periods of temporal lobe epilepsy (TLE).***[2]

These symptoms, at least in part, are often displayed by those afflicted by frontal or TLE. It is interesting that they are often also found in bipolar illness, at least during the manic phase. This observation led psychiatrists and neurologists in the 1970s and 1980s to use Carbamazepine (Tegretol) as treatment for bipolar illness, with varying degrees of success. In the 1980s, Tegretol was very popular for TLE. It was then thought perhaps some cases of bipolar illness were actually due to deep seated temporal lobe foci. The foci had to be deep seated, as most bipolar patients showed no electroencephalographic abnormalities, even with nasopharyngeal leads. This is still the hypothesis, as both Lamotrigine and Topiramate are currently being used to treat not only TLE, but bipolar psychosis as well.[5] Of further note is that Topiramate is very effective for migraine headaches, and migraines have long been speculated to be the result of a discharging focus as well.[6] These patients typically also have "***stickiness of thought processes and adherence to an idea***" and that may actually be the most salient feature of this disorder. For example, patients may have difficulty terminating conversations or ending interpersonal encounters, such as ending a doctor's office visit or a visit to a friend. Patients with hypergraphia may also have difficulty restricting their written communications, such as letters or memoranda written with a compulsion that reaches to an obsession and expressed with an excessive moral or religious fervor. I had to learn all of these syndromes as a doctoral student, and I was taught that the majority, if not all of them are found to have a neurological or neurosurgical etiology. Obviously, today, we know that such disorders as schizophrenia or bipolar illness have an organic basis too, but as it has yet to be consistently demonstrated in each individual afflicted patient, I think, it is still appropriate to use the word "functional" to describe them. I do not think the author mentioned it, but the most fascinating of all these syndromes for me is Cotard's syndrome, where the patient thinks they are dead and decomposing. They smell their own rot, and cease bathing and grooming themselves, because after death, that is not necessary.[2]

I am not sure if "stickiness" of ideas might not be a form of perseveration, just like always needing to have the last word in a conversation might be. From my own experience with inducing mild traumatic brain injury in animals, then correlating the animal's behavior with magnetic resonance imaging tractography, it seems that any injury or process involving a large portion of the frontal-temporal cortex, particularly with white matter shearing can be accompanied by this. The animal becomes uncertain of its every move. Should it have done that? It is so obvious just by observation, that one hardly would need the animal to speak.

In chapter 5, ***Plants of the Gods and their hallucinogenic powers in neuropharmacology,*** there is another fascinating discussion, and this time it considers the history, uses, and abuses of the plant Belladonna. The full name of the plant is *Atropa belladonna*, and that might give away one of its main medical uses because the extract of the plant is used as a major anticholinergic drug, atropine. Atropine may not be prescribed as much as it used to be, but it was of great use to ophthalmologists to dilate the pupils during fundoscopic examinations. Perhaps its tendency to induce glaucoma in otherwise asymptomatic patients (by inducing swelling in a fixed and dilated iris), plus advances in ophthalmoscopic technology, which now give an excellent view of the fundus even if the pupils are pinpoint, were some of the reasons for ophthalmologists abandoning it. It was also used by psychiatrists and neurologists to treat movement disorders, either primary (idiopathic) or secondary to anti-psychotic poisoning, though it does nothing for tardive dyskinesia. For tardive dystonia and oculogyric crises, it is still an excellent first line of treatment (though other, weaker anticholinergics such as benzotropine are now surpassing it, because they have fewer tendencies to induce mental and behavioral disturbance. We know that as an anticholinergic, atropine creates a functional overload of dopamine, which might be desirable in the basal ganglia, but not in the mesolimbic system. It might not be favorably acting on the tubero-infundibular system either, as any male Parkinson's patient taking atropine or any other strong anticholinergic and subsequently growing breasts might tell you.[12]

Atropine's effects on the mesolimbic system are likely responsible for the hallucinogenic properties of Nightshade plants, and these drug-induced psychotic episodes do bear some resemblance to mental illnesses from other causes. Still, on these drugs, a person tends to hallucinate visually or at least see great distortions of reality. Typically, in the functional psychoses, they are much more likely to suffer auditory hallucinations.

Nightshade species were also used in bygone eras to poison enemies and former lovers. One could extract hyoscine, hyoscyamine, and atropine from crude preparations of this plant without too much trouble in the Victorian era. However, they have highly similar molecular configurations, so forensic scientists worked hard in those days to develop a test to differentiate which one of the three were actually used.

In those days to convict in a court of law required demonstrating which of these specific chemicals were employed, as happened in the infamous October 1910 London trial of Dr. Harvey Crippen. The English celebrity pathologist Bernard Spilsbury (first of many; others like Drs. Thomas Noguchi and Milton Halpern come to mind) determined the incompetent and repeatedly cuckolded doctor poisoned his buxom, fun loving wife with hyoscine. That was enough for the Crown to hang him.[8]

Chapters 8–13 look at a general history of ancient medicine, which is not my greatest interest, but I have always thought Galen's idea that human anatomy was the same as animal anatomy to be one major factor in stifling medical science for centuries. Human anatomy is extremely similar to mammalian anatomy, because humans are mammals. But that is not enough. If medical science is to advance, it must be exactly the same, not just extremely similar. I am the last person to criticize the church, but they made Galen an untouchable figure because some of his ideology overlapped with theirs. I remember reading about a group of medieval monks who were debating how many teeth a horse had. It seems that Galen was in error when he counted them, and a few of the monks had noticed this. One monk indicated that right outside the monastery there was a horse grazing, so why did not they just go out and count them? The answer he received from the others was a severe beating. You just could not question Galen like that! It is quite disturbing that in 2023, we are seeing a revival of this kind of twisted thinking. People's lives are being destroyed for using common sense.

The author makes an interesting statement in Chapter 9. He quotes Harvard biochemist Lawrence J. Henderson who remarked, "Sometime between 1910 and 1912 in this country, a random patient, with a random disease, consulting a doctor chosen at random, had, for the first time in the history of mankind, a better than a 50% chance of profiting from that encounter". The author agrees with this, but thinks it goes back further, to the 19th century. The author is correct. I don't know where Henderson gets this 1910–1912 from. However, I would date the remarkable change in medical care to the 1890's. In that decade, Lister's spray was abandoned in favor for maintaining sterility in the operative field, instead of constantly sterilizing it with caustic carbolic acid. Then, we have X-rays introduced by early 1896, and it was quickly determined what kind of conditions they were helpful in diagnosing. There were quite a few, but despite Harvey Cushing's ultimate disappointment with them, he had obtained good ancillary diagnostic results in quite a few cases. By 1899, it was known that pituitary masses could be diagnosed by X-rays of the sella, and by the early 1900's the shifting of physiological calcifications in the brain was appreciated as a method of lateralization by X-ray. Whether shifting of the calcification was towards or away from the lesion could only be determined by the history and neurological examination. The tendency of meningiomas to hyperostose nearby bone made them diagnosable by skull X-rays as early as 1902.[9,10]

I find this interesting, because most people believe technology is driven by science. In many cases that is true, but when you look at what the Victorian era gave medicine, you see this is not always the case. They did not understand how X-rays and anesthesia worked until a few decades later, nor did they appreciate fully what the connection was between infection, bacteria, and nonsterile operations. In fact, the precise mechanisms by which general anesthesia works are not known, even now. Ignaz Semmelweis was treated extremely poorly by his colleagues, and there is no excuse for that. However, he did not know why his experiments worked to reduce postpartum infection, only that they did. That was not his fault, but if someone is going to suggest radical changes in any field of study or practice, they cannot expect others to take them seriously if they cannot explain why something works. Of course, Lord Lister did not have any idea what his carbolic spray was doing when he introduced it in 1867, and he was mocked and ridiculed too.[1] Eventually, perhaps because of his reputation as an excellent surgeon, his spray prevailed, but it must have been a horror for surgeons to operate being sprayed with such a caustic substance throughout the entire operation.

For one of William Halsted's operating room nurses it certainly was, so he designed a pair of rubber gloves to protect her delicate hands against the carbolic spray. He did that because of love, not infection, and they soon married.[7] Joseph Colt Bloodgood heard about the gloves, and recognized their potential to avoid infection of the patient during surgery by the early 1890's. After this, it was only a brief matter of time before Lister's spray became obsolete.

Chapters 14–20 examine medical ethics as viewed through the lens of traditional Judeo-Christian morality. Bioethicists

have been pushing for involuntary euthanasia for many years now in the United States, and like the author, I find this nothing short of Hitlerism. Hitler was gassing incurable cases at a time when he was doing little more than making the lives of Jews and other ethnicities uncomfortable. Plus, as proud as he was of being a corporal in World War One, he was gassing injured and disabled war veterans, because he did not see what the point was of wasting government money to pay pensions to people who could no longer contribute anything to society. I am sure that is exactly what would happen here, if we started killing people because they were too old or sick to waste money on anymore.

Chapters 21–25 discuss the multiple problems with socialized medicine, and why it would not be desirable to implement it in the United States. I agree with the author wholeheartedly. My own father was an eminent New York City radiologist before he retired. He was educated at Dalhousie University in Nova Scotia, Canada. My father and many of his med school friends emigrated to the United States after their internship at the Victoria General in Halifax. They did this because even in the 1960s, they did not feel comfortable with the Canadian federal government telling them what they could and could not do for their patients.

***Controversies in Medicine and Neuroscience: Through the Prism of History, Neurobiology, and Bioethics*** then narrates salient points in the history of plagues (Chapters 26 and 27), both diagnosis and containment.

This is a fascinating section because of my never ending respect for Isaac Newton. I would never claim Charles II was England's greatest king, but he was fascinated by the slew of discoveries about the natural world by the mid-1660s, and was a big patron of Newton, generously funding not only him, but the universities. Charles had to close the universities, during the *annus horribilis* of 1666 [fearing spread], sending the unmarried Newton back to his mother's house. He enjoyed sitting in her apple orchards and thinking. So the story goes, an apple hit him on the head, and he wondered if whatever force pulled down the apple might not extend much further. Why not as far as the moon? It is likely this story is not true, but it does not matter. It seems like Charles partly turned 1666 into an *annus mirabilis* by giving Newton much free time to think.[13]

In Chapters 12 and 13, ***Controversies in Medicine and Neuroscience*** delves into the death of Joseph Stalin, a hot topic, and extremely controversial, even to this day. I think he makes an excellent case for Warfarin poisoning, both medically and politically. There is some opposition to this, and this reviewer also holds partial opposition to the author's case, as laid out in *Surgical Neurology International*.[3] The author is likely right about Stalin's poisoning, but that doesn't mean disagreement cannot be held with certain aspects of his theory. I do not see how Warfarin was the best choice of poisons, given that even the Soviets knew by 1951 that the remedy for it was Vitamin K, which was very easy to obtain and administer, even in the Soviet Union. Beria was quite cunning and intelligent. Would he risk using Warfarin, if a doctor considered Warfarin poisoning, and gave some Vitamin K to Stalin? Furthermore, it is more likely than not that that Warfarin will cause a diffuse coagulopathy, and while there were myocardial and intestinal petechiae, there should have been more than just brain and stomach bleeding.[11] In addition, Bulganin wondered if it were possible that Stalin had stomach cancer. Bulganin is the perfect example of how the Soviet system worked to give the most mediocre people a great deal of power. Yet, he had a point. Unlike Lenin's extremely detailed autopsy report, Stalin's autopsy report was about the scantiest I have ever read. Why is concomitant multisystem disease always implicitly ruled out? It is not as if Stalin was not a great candidate for peptic ulcer, plus he had underwent an appendectomy in 1921 with an extremely rough postoperative course, and thereafter suffered from what his doctors diagnosed as irritable bowel syndrome. One wonders if he really had ulcerative colitis. We just do not know, because it is strongly suspected his organs were destroyed 7 years after his autopsy, and while the brain might still exist, nobody knows where it rests now. One positive aspect you might ascribe to Lenin is that he believed the Soviet people had the right to know the health status of their leaders. That does not make him any less despicable than Stalin, but it does make Lenin's autopsy report much more detailed, giving researchers more confidence to draw reliable conclusions from it.

Furthermore, Beria made statements to the effect that he had killed Stalin, but I cannot put much weight on that. That is because Stalin was about to have his entire inner circle shot, so whether Beria did it or not, bragging about killing Stalin would not elicit any negative response from them. In fact, Beria probably thought they might be grateful for it. They probably were, but still too terrified of him to allow him to live. What is interesting is that he was not executed for Stalin's murder. That does not prove he did it or not, but it suggests that if they felt he did, it was no crime to them.

What's also interesting is that because of the half-life of Factors II, VII, and IX, Warfarin will not induce coagulopathy for about 48 h.[4] This roughly corresponds to Stalin's first stroke (as far as we can ascertain), but then it means the dose must have been placed in Stalin's wine at the beginning of the evening. How could he not have noticed that? Khrushchev notes that out of character for Stalin, he was a bit tipsy that night. Perhaps he was, but he would not have been so early in the evening when Beria is alleged to have dosed the wine. Plus, the general literature indicates that Warfarin fatality in humans is rare unless the dose is massive. Do we have any idea how much Warfarin Beria is supposed to have placed in Stalin's wine?

I have always maintained that the sudden increase of intracranial pressure associated with acute cerebral hemorrhage would be enough to cause a Cushing's ulcer, with bleeding. For some reason, there are many who think Cushing's ulcer takes some time to develop, but that is not true. It is not akin to papilledema, which might take several days to become clinically evident after a rise in intracranial pressure. Stalin showed pyramidal tract signs after his stroke, but no changes in his nerve heads.

In this review, I have tried to give a general overview of ***Controversies in Medicine and Neuroscience***'s most thought-provoking book. Because he packs so much information into a relatively averaged sized publication, it was not possible for me to give commentary on every chapter. The commentary I did give was specific to chapters in his book devoted to interests that I share with the author. I am recommending this book to anyone whose interests include biomedicine, history, and the politics of medicine. I did remark that ***Medicine and Neuroscience: Through the Prism of History, Neurobiology, and Bioethics*** is just one more absolute masterpiece that I recommend to any medical professional: MD, PhD, RN, PT, etc., because the majority of issues in this tome are of the greatest practical and academic interest to physicians, scientists, and other highly skilled healthcare workers. I did not mean to imply it would not make good reading for anyone who has great interest in any of the subjects covered. Because this is a limited academic edition, anyone who wants to read this book should order it from Amazon immediately. Given the popularity of the author's previous books when sold from Amazon, I do not think it will be long before all the copies will be bought.

If an interested reader wants to purchase this book, and finds Amazon can no longer supply it, they can always contact Cambridge Scholars Publishing at https://www.cambridgescholars.com/product/978-1-5275-9417-3/, and have the book shipped to them.

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