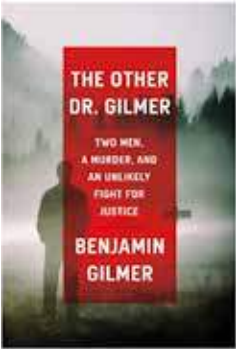


Book Reviews

Jack Coulehan, MD, MPH, and Raymond Barfield, MD, PhD, Book Review Editors



The Other Dr. Gilmer: Two Men, a Murder, and an Unlikely Fight for Justice

by Benjamin Gilmer, MD
Ballantine Books, New York, 2022,
with new postscript 2023

Reviewed by Raymond Barfield, MD, PhD (ΑΩΑ, Duke University School of Medicine, 2017, Faculty)

At the beginning of a career in medicine, we usually dream of shaping our practice according to our highest ideals, but with time, we often become aware that our practice shapes us. Rarely is the experience of having our lives shaped by a medical practice as pervasive, intense, and unexpected as the story Dr. Benjamin Gilmer tells in his memoir *The Other Doctor Gilmer*.

What would you do if you had just finished residency, joined your first clinic, and discovered not only that the doctor you were replacing had your last name, but that he had also murdered his father?

This is the situation in which Benjamin Gilmer found himself when he joined the small family medicine clinic started by the other Dr. Gilmer, Vince—a physician who was much loved by his patients. He had also strangled his father with a dog leash, cut off most of his fingers, and left him in a ditch on Good Hope Road. Vince then went home, cleaned up, and appeared on time the next morning at the Cane Creek Clinic, where he saw patients from 8 a.m. to 6 p.m., without raising any suspicions among his staff.

The twists and turns, along with the heartbreaking epiphanies, are worthy of a master writer of thrillers. Unfortunately, they are not fiction. Because of the skillful way the story is told, adding to the power and effectiveness of Benjamin's illumination of themes important to medicine, and to our country as a whole, I am doing a favor to the reader by insisting that you have to read the book to find out what happens.

I was especially interested in the book because Benjamin's clinic is near my hometown of Asheville, NC, and he is on the staff of the hospital where I work. So, I asked him if he would meet me for lunch.

We met two weeks before Vince was supposed to be liberated from prison.

I soon realized that, even apart from his extraordinary experience with his predecessor, Benjamin is one of the

most remarkable people I had ever met. He was a Schweitzer fellow in Gabon, West Africa, and he brought the philosophy of Albert Schweitzer to rural North Carolina. His commitment to patients as complete spiritual beings led him to engage the other Dr. Gilmer who was imprisoned for murder in the Wallins Ridge Facility in Virginia. Benjamin became an advocate for people suffering mental illness behind bars. Along the way, he witnessed painful and difficult realities in our country that are relevant to all of us in light of Dostoevsky's observation, which he chose as the epigraph for his book: "The degree of civilization in a society can be judged by entering its prisons."

The lessons Benjamin learned from Vince's tragic story reach past the prison walls and touch many broken parts of our patients' lives, which we see every day as physicians. Benjamin told me that Vince's patients and their stories inspired him to stay curious and open enough to explore a very uncomfortable space. This reinforced his commitment to pay attention to patients' stories, even as corporate pressures squeeze the time available for patient encounters. He added that the experience of walking this journey with Vince taught him that listening is perhaps the most important healing tool we have as physicians.

Benjamin also rediscovered the ways curiosity can lead to deep inquiry if we let it. In his case, he said that he almost feels like the universe pushed him down this path, and he firmly believes that if we embrace such opportunities, we can be transformed. As our conversation evolved, he said that seeing the prison and coming to know Vince awakened him to a problem he was embarrassed to know so little about as a physician—the intersection between mental health and mass incarceration. And through the process of writing Vince's story, he gained a new appreciation for the Hippocratic Oath: doing no harm is essential, but so is acting courageously when we recognize that a wrong is being committed.

This is the essence of "Reverence for Life,"¹ which is the mantra Dr. Albert Schweitzer left us, and which guides much of Benjamin's practice and his teaching of residents. In many ways, Schweitzer argues, the mantra takes the Hippocratic Oath to a higher ground, reminding us that our most sacred work is advocating for others. This has been Benjamin's calling in his advocacy for Vince.

At the end of our exchange, Benjamin said that he learned another surprising lesson during this journey, which is the importance of taking time for the kind of reflection and adjustment of our vision that is essential to our own mental health, and to the pursuit of advocacy for the just treatment of others. Transformation requires us to

do this, and yet, it is probably one of the hardest aspects of being a physician because time carries such a premium.

Vince remains behind bars, despite being granted his clemency in 2022. Benjamin continues advocating for Vince, he is learning the profound deficits of our mental health system, which does not have the capacity to treat our most vulnerable citizens, and the consequences are devastating. There are 10 times more Americans with severe mental illness in prison than in all our mental health facilities combined.

Obstacles created by rigid bureaucracies and the stigmas attached to mental illness make things even worse. Vince's new parole conditions demand that he be in a "locked facility," rather than a "suitable facility," as Governor Northam had requested. For Vince, who has complex medical, neurologic, and psychiatric needs, the mercy of clemency cannot free him from imprisonment until the language of "locked facility" is changed.

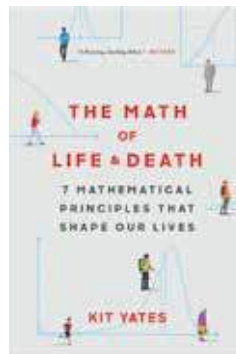
I admit that I was surprised and saddened by Benjamin's account of how reluctant hospitals are to care for complicated patients like Vince who need prolonged hospital stays. He pointed out that this reluctance includes our own for-profit hospital which continues to reject Vince as a patient, even though they have an appropriate locked ward. Another North Carolina hospital with fewer resources than our own has stepped up and is committed to taking care of Vince so that he can die with dignity, but unfortunately it is not locked. As soon as the Virginia parole board changes this language, Benjamin hopes a transfer will be expedited so that Vince can be treated with dignity and care during the final part of his life.

Before we parted, Benjamin encouraged me to remember that medicine can teach us so many life lessons if we remain committed to a career of curiosity and life-long learning that leads to transformation. He said that Vince will be honored if his story inspires us to pursue our own advocacy journey. You can find more information on his website, along with updates about Vince's progress and information about the documentary film that is being made about Vince's quest for freedom, at <https://benjaminjilmer.com>.

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The Math of Life and Death: 7 Mathematical Principles That Shape Our Lives

Kit Yates, PhD
Scribner; Standard Edition
January 7, 2020; 288 pages

**Reviewed by Lara Hazelton, MD,
MEd, FRCPC**

Galileo Galilei famously wrote that nature is "written in the language of mathematics."¹ Unfortunately for most of us, math is a language that is spoken poorly. Every day, we navigate the uncertainties of life with only the most rudimentary understanding of risk and probability, our decisions guided more by emotions than rationality. Could we make better choices, as individuals and society, if we had a clearer understanding of how principles of mathematics operate in our day-to-day living? And how might this impact our practice as physicians?

The ubiquity of mathematics is the subject of *The Math of Life and Death: 7 Mathematical Principles That Shape Our Lives*. Yates is the codirector of the Centre for Mathematical Biology at the University of Bath in the United Kingdom. His work in the field of mathematical biology has been reported on by numerous news outlets and periodicals aimed at the general reader. In the introduction to the book, Yates explains that he sees mathematics first and foremost as "a practical tool to make sense of our complex world."^{p5} He sets out to present math (or "maths" as the original British title read) as a field that can be understood by all.

As Yates reassures the reader, there is not a single equation in the book. Instead, *The Math of Everyday Life* is written in an engaging style with anecdotes of how society's lack of math literacy may lead many to misinterpret reality and make poor decisions. Pyramid schemes fail because the implications of exponential growth aren't fully understood. Miscarriages of justice occur when probability is misrepresented. There is a chapter with the wonderfully descriptive title, "Don't Believe the Truth: Debunking Media Statistics."

For physicians, the book provides some sobering reminders that we are not immune to the same errors that media, law enforcement, and con men make. The second chapter of the book is entitled, "Sensitivity, Specificity, and Second Opinions: How Math Makes Medicine

As a recovering epidemiologist I remember many years of teaching second year medical students about sensitivity, specificity, and predictive value. We would present cases in which tests with high sensitivity and specificity were used inappropriately because the prior probability of a disease was very low and, consequently, the predictive value of a positive test turned out to be, say four percent or five percent. Some students found it almost impossible to believe that most positive results of a high-tech test were actually false.

—Jack Coulehan, MD, MPH

Manageable.” One might wonder whether this title is overly optimistic. After all, the benefits of math are limited by the math literacy of medical practitioners.

Yates includes the example of breast cancer screening and false positives. In 2007, 160 gynecologists were given information about the accuracy of mammograms and the prevalence of breast cancer in a population. They were then presented with a four-option multiple-choice question that asked them to identify the likelihood that a patient with a positive mammogram actually had breast cancer. The most popular response dramatically overestimated the likelihood, and the correct answer was chosen by only one-fifth of respondents—which as Yates points out, is worse than if the answers had been chosen randomly.

There are many other fascinating examples of the intersection of medicine and math. The placebo effect turns out to be regression to the mean in most cases. The so-called Millennium Bug that affected computer systems in 2000 causes a pathology lab’s computer model to miscalculate prenatal risk of Down syndrome. Misinterpretation of statistics related to sudden infant death syndrome (SIDS) leads to a miscarriage of justice.

The paperback edition of the book was published in 2021 when the COVID pandemic was at its height, and there is a chapter on infectious diseases subtitled “How to Stop an Epidemic,” which is particularly interesting to read.

Yates is a strong advocate for the power of math literacy. In the final chapter, “Mathematical Emancipation,” he writes that, “Appreciating absolute and relative risks, ratio biases, mismatched framing and sampling bias gives us the power to be skeptical of the statistics screamed from newspaper headlines, the ‘studies’ pushed at us in ads, or the half-truths that come tumbling from the mouths of our politicians.”^{p245} It’s a plea that deserves

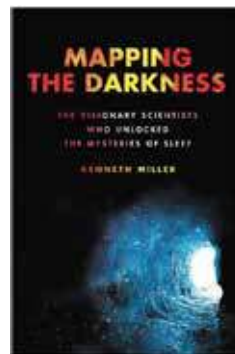
to be heard by the profession.

For physicians, appreciating the application of math in our practice is literally often a matter of life and death.

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Mapping the Darkness: The Visionary Scientists Who Unlocked the Mysteries of Sleep

by Kenneth Miller
New York, Hachette Books, 2023

Reviewed by Jack Coulehan,
MD, MPH (ΑΩΑ, University of
Pittsburgh, 1969)

Medieval cartographers decorated their maps with images of dragons and other mythological creatures to indicate territories unknown to the European world. Until the early 20th century, sleep was a similar region in the scientific world—dark and trackless, but rife with speculation. Aristotle taught that sleep was a necessary requirement for the soul to reflect and gain knowledge, but had little further to say. More than 2,400 years later, geographers of sleep had made no further progress in determining its cause, mechanism, or purpose.

Physiologists, like Ivan Pavlov, speculated that sleep might result from the accumulation of an internal inhibitor produced by the day’s activity, and cleared at night during sleep. Psychoanalysts resurrected a relatively benign version of the medieval dragons by proposing that dreams were a safety valve “for libidinal energy, which would otherwise erupt in the waking state as psychosis.”^{p114} With regard to hard evidence, sleep remained *terra incognita*.

In *Mapping the Darkness*, Kenneth Miller begins his story of 20th century sleep research with Nathaniel Kleitman, a Russian-Jewish émigré who shocked his doctoral

advisor at the University of Chicago in 1922 by selecting the thoroughly obscure topic of sleep physiology for his dissertation research. The advisor warned him against it, but Kleitman stood his ground. He had fled with his family from a pogrom in Russia when he was eight-years-old. At 20-years-old, he escaped World War I by obtaining a fraudulent passport and emigrating to the United States. He was determined he could do the research.

Kleitman initially studied sleep-wake cycles with student volunteers. He demonstrated the relationship of body temperature to sleep, which eventually grew into an understanding of circadian rhythms. Later, he was joined by two colleagues, Eugene Aserinsky, a nonpracticing dentist with a gambling habit, and William Dement, a discontented psychiatrist whose goal was to find evidence supporting Freud's theory of dreams. In the 1950s, this Chicago trio made seminal discoveries that constitute the backbone of sleep science, including rapid eye movement (REM) sleep, its relationship to dreaming, the four stages of sleep, and the clinical consequences of altering normal cycles.

In 1963, William Dement moved to Stanford University, where he established the Stanford Sleep Disorders Center in 1970, the first such clinical facility in the United States. However, sleep medicine remained a small enterprise until receiving a major boost from Australian scientist, Colin Sullivan, who published an article in 1981, describing his successful reversal of obstructive sleep apnea (OSA) by continuous positive airway pressure (CPAP). Prior to that, tracheostomy had been the standard treatment for OSA, which at the time was considered an uncommon disorder that afflicted only obese men.

Several years later, Sullivan perfected a strap-on mask version of his original device. After an epidemiological study in 1993 concluded that OSA was actually very common, afflicting up to 24 percent of American men and nine percent of women, medical device companies began to mass produce Sullivan's mask, and the clinical use of CPAP experienced explosive growth.

I was particularly struck by two other features on Miller's historical map. One was Mary Carskadon's studies of adolescents' sleep requirement. Carskadon began her career in 1970 as William Dement's lab assistant at Stanford. She initially developed and tested the Multiple Sleep Latency Test (MSLT), an objective measure of daytime sleepiness, and later employed this instrument in clinical and epidemiological studies of children and adolescents.

In 1990, she reported that adolescents require substantially more sleep than children to maximize their

daytime wakefulness. It had been widely assumed that teenagers required less sleep than younger children, a belief that served as the rationale for scheduling high school start times an hour or more earlier than those of elementary schools.

Carskadon found that adolescents tended to build sleep deficits that contributed to moodiness, inattentiveness, and emotional disorders. While these findings have been confirmed by numerous studies during the last 30 years, they have had little impact on public education. California is the only state that has taken sleep seriously enough to require high schools to begin classes no earlier than 8:30 a.m.

Another striking finding was the clash of actual with circadian rhythms. Thanks to Kleitman and others, circadian rhythms were well-understood by 1980, yet there were frequent discrepancies between individuals' sleep cycles and their circadian rhythms, as measured by alertness, body temperature, and hormone levels. In 1982, Alexander Borbély, a professor at the University of Zurich, described a two process model of sleep regulation. One process is the innate circadian rhythm of approximately 24 hours, governed by the hypothalamus. The other is a history-dependent cycle, resulting from the accumulation of a sleep-promoting substance (Process C) during waking hours. Normally, these two cycles coincide, but the latter may change markedly with altered sleep habits (e.g., shift work, jetlag), while the former remains relatively stable. Ironically, Borbély's sleep-promoting substance reinstated Ivan Pavlov's internal inhibitor, which Kleitman and his successors had rejected in favor of a sleep cycle generated by the suprachiasmatic nucleus of the hypothalamus. The two-process model is the basis of today's understanding of sleep regulation.

For Miller, the age of "visionary scientists who unlocked the secrets of sleep" (the book's subtitle) ended late in the 20th century. Nonetheless, sleep research continues, though *Mapping the Darkness* does not. Thus, the roles of the pineal gland and melatonin are barely mentioned,¹ and the fact that Borbély's sleep-inducing Process C is now known to be adenosine accumulation while awake² is mentioned only in a footnote.

Mapping the Darkness is an engaging and informative history of 100 years of sleep research, but a fundamental question remains. Why is sleep an almost universal phenomenon among animals? Why do we need it at all? It seems the purpose of sleep lies as much in the region of dragons now as it did when Aristotle speculated that sleep was required for the soul to gain knowledge.

Book Reviews

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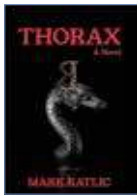
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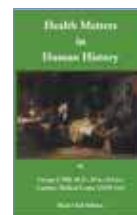
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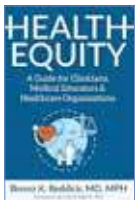
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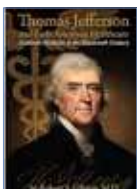
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