

Reviews and reflections

David A. Bennahum, MD, and Jack Coulehan, MD, Book Review Editors

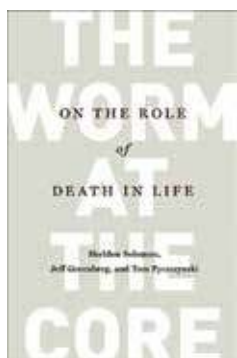
The Worm at the Core: On the Role of Death in Life

Sheldon Solomon, Jeff Greenberg, and Tom Pyszczynski
Random House, New York, 2015, 274 pages

Reviewed by John L. Wright, MD (ΑΩΑ, Drexel University
College of Medicine, 1956)

Teach me to live, that I may dread
The Grave as little as my Bed;

—Thomas Ken¹



These lines are taken from the seventeenth-century prayer-poem, “All Praise to Thee, My God, This Night,” by the clergyman Thomas Ken. And although the authors of *The Worm at the Core* don’t advocate for prayer as a solution to man’s dread, they don’t discount it either. In fact, the main intent of the book is to teach just that—how to live with dread. In the introduction, they state, “our overarching goals are to reveal the many ways the knowledge that we are mortal underlies both the

noblest and most unsavory of human pursuits, and to consider how these insights can lead to personal growth and social progress.”^{pxi}

Experimental social psychologists Solomon, Greenberg, and Pyszczynski collaborated for over twenty-five years. In the 1970s, as young researchers, they discovered that they shared an interest in understanding the fundamental motivations that direct human behavior. Their studies led them to focus on two basic human drives: “First, . . . to protect our self-esteem. Second, . . . to assert the superiority of our own group over other groups.”^{pviix-ix}

In the early 1980s they discovered the writings of Ernest Becker, who by synthesizing insights from anthropology, sociology, psychology, philosophy, religion, literature, and popular culture, provided a conceptual framework for answering the question, “What makes people behave the way they do?” Becker’s answer, largely spelled out in his 1974 Pulitzer Prize winning book, *The Denial of Death*, was the existential fear of death—the worm at the core—that every human being carries within him or her. Furthermore, he and others argue that *Homo sapiens* is the only animal that experiences such fear. To illustrate this claim, the authors present the first verse of W. H. Auden’s poem, “The Cultural Presupposition.”

Happy the hare at morning, for she cannot read
The Hunter’s waking thoughts, lucky the leaf
Unable to predict the fall, lucky indeed
The rampant suffering suffocating jelly
Burgeoning in pools, lapping the grits of the desert,
But what shall man do, who can whistle tunes by heart,
Knows to the bar when death shall cut him short like the
cry of the shearwater,
What can he do but defend himself from his knowledge?^{p7}

So what’s the big deal? The authors claim it is this fear that causes man to “so desperately crave self-esteem,” and explains “why we fear, loathe, and sometimes seek to obliterate people who are different from ourselves.”^{pix} Further, they contend, “Over the course of human history, the terror of death has guided the development of art, religion, language, economics, and science. It raised the pyramids in Egypt and razed the Twin Towers in Manhattan.”^{px} They also go on to list the many ways this fear contributes to man’s senseless and destructive behavior. In fact, given the twenty-first century’s lethal weapons, they write, “And because nation-states will use whatever military technology they possess to defend their secular or religious ideologies—whether to ‘keep the world safe for democracy’ or ‘to rid the world of evil’—there is a very real danger that we humans will be the first form of life to be responsible for our own extinction.”^{p149}

In the early pages, and for me the most satisfying pages of *The Worm at the Core*, the authors consider human development starting with infancy, emphasizing ingredients crucial for growing self-esteem, and the importance of self-esteem to becoming a convinced and successful participant in one’s inherited culture. “Our beliefs in literal and symbolic immortality,” the authors assert, “help us manage the potential for terror that comes from knowing that our physical death is inevitable.”^{p9} Much of their understanding falls under what Becker called the twin ontological motives—human striving for meaning in life and the escape from loneliness through heroic living, or immersing oneself under one banner or another.

Over the past thirty years, the authors of *The Worm at the Core* and many other social psychologists have conducted a broad program of research developing a field they call Terror Management Theory. In such investigations, researchers select a cohort of persons who have the same roles and typically carry out a specific behavior; for example, a cohort of judges whose job often entails setting bail for arrested prostitutes. They then assign participants either to an intervention (a brief imaging exercise that requires them to imagine their own deaths) or to a control group without such a reminder. Then both groups are subjected to situational tests and their responses evaluated—for example, how does intervention

influence a judge's bail setting behavior? In this particular case, judges exposed to the intervention tended to set higher bail (\$500 instead of the usual \$50, say) than they had set previously, while the control judges continue their usual pattern. The authors conclude that, "after being reminded of death, we react generously to anyone or anything that reinforces our cherished beliefs, and reject anyone or anything that calls those beliefs into question."^{p13} In the case of prostitutes, the judges feel more negative and set higher bail. Alternatively, reminders of death lead people to hold more firmly to cherished beliefs. The authors hope that such revelations cause us to, "First, . . . become more aware and accepting of the reality of our mortality. Second, we can strengthen our sense of death transcendence in non-destructive ways."^{p218}

I find the last section of the book the least satisfying. Here, the authors discuss how the fear of death is an underappreciated contributing factor in psychological disorders. That neglect may well be the case, but they tend to portray terror of death as a core feature of almost all significant mental disorders (e.g., schizophrenia, depression, substance abuse, post-traumatic stress disorder), while ignoring other biological and psychological factors. Thus, I do not think this section contributes significantly to an otherwise authoritative and comprehensive look at how the knowledge of our demise impacts our behavior.

Finally, having begun this review with a quote from a prayer-poem, I want to end it just so. In his excellent study, *Poetry as Survival*, Gregory Orr uses, as the epigraph to the chapter entitled "Convulsive Transformation of the Overculture," this less than optimistic quote from Sara Hutchinson, a Cherokee woman:

I pray for many things, things the Overculture
may never pray for.²

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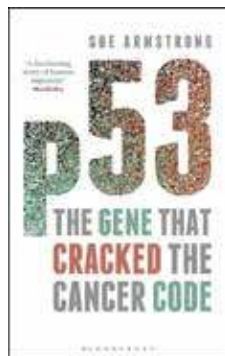
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p53: The Gene That Cracked the Cancer Code

Sue Armstrong
London, Bloomsbury Sigma, 2014, 287 pages

Reviewed by Thoru Pederson, PhD



Readers of *The Pharos* who were in training or embarking on their medical careers in the 1960s and 1970s may recall being aware of the oncology community's passionate belief that most human cancer was caused by either viruses or chemicals. These two ideas about the causation of cancer were so widely accepted that the National Cancer Institute launched major intramural programs on both viral and chemical carcinogenesis, and also began to increase its extramural

funding on projects based on these two ideas. The data at hand were limited and someday a historian of science will capture this wobble in America's well-intentioned effort to "cure cancer," a goal that former President Richard Nixon told his interviewer Barbara Walters years later that he regarded as his greatest accomplishment (in signing the National Cancer Act of 1971).

There can be no doubt, from many compelling epidemiological studies, that some human cancer is initiated by exposure to chemicals that mutate DNA (as we now recognize, in hindsight, from Percivall Pott's famously prescient 1775 report of an increased incidence of scrotal tumors in young men whose profession was evicting the residue of London chimneys). And we also know that some human cancer is indeed caused by viruses, of which adult T-cell leukemia (HTLV-1) and cervical cancer (human papillomavirus) are the two most notable examples.*

Then the 1980s arrived, and Harold Varmus and Michael Bishop developed the remarkable insight that most human cancer is indeed caused by viruses, but not as an infecting agent. Rather, these viruses silently sneak their DNA into human chromosomes, where it lies dormant and can incite tumor formation later.¹⁻³ This made scientists realize that much human cancer comes from within the genome. The gifted writer Sue Armstrong takes up the next phase of cancer research in this engaging book: what keeps these endogenous cancer-causing genomic invaders in check?

The author has previously written on broad issues of science and health, but in this book dives in deeply, interviewing all the leading characters in the story and making it come to

*As a historical point, it is worth noting that Peyton Rous' 1911 discovery of a viral agent causing soft tissue cancer in chickens was not recognized with a Nobel Prize in Physiology and Medicine until 1951.

life. First, a specific protein was identified in a few cell biology research laboratories, and because the molecular weight of this protein was found to be 53,000, it was dubbed p (for protein) 53. At first, this protein, which appeared to be involved in cell growth, captured little attention. But then the story quickens.

The author then describes the pioneering work demonstrating that human cells have genes that can suppress cancer.[†] Nothing about p53 seemed to make sense until scientists began to think that perhaps it functions as a tumor suppression gene. If such a gene mutates and can no longer perform its job, cancer cells can proliferate unchecked. It is now known that such “loss of function” mutations in the normal gene for p53 are responsible for half of all human cancer. The book closes on how “p53-ology” informs current cancer chemotherapy drug design, where I found the author to be very *au courant*, although there are other equally compelling recent accounts for the general audience.^{4–7}

Having praised the book, I cannot resist conveying one minor point on which I also torture all my biochemistry students. The author states that p53 was named on the basis of its “molecular weight of 53 kilodaltons.”^{p44} However, molecular weight is a dimensionless parameter, so the correct term is either a molecular mass of 53 kilodaltons, or a molecular weight of 53,000 (no units). The fact that Sue Armstrong is not a scientist and this is the only quibble I have demonstrates the fine job she has done.

I recommend this book to all physicians because it is a spellbinding story of biomedical research sleuthing. I suspect even nononcologists will find it of interest. The author also conveys a back story about the culture of science, *viz.*, how tenaciously certain shibboleths can be adopted by a guild, its members locked in a mutually agreed upon canon, and how it is usually a few intrepid scientists with open minds that bring about a revolution.

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[†] That work, by Henry Harris, George Klein, and Alfred Knudson, has been an annual Nobel Prize candidate for many years, and despite Harris’ death last year this discovery is likely still under consideration.

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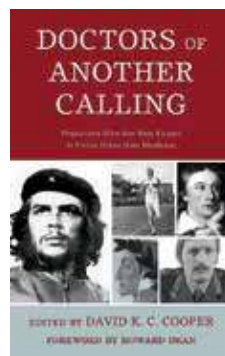
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Doctors of Another Calling: Physicians Who Are Best Known in Fields Other than Medicine

David K. C. Cooper

University of Delaware Press, Newark, Delaware, 2014

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



In 1795 the Scottish explorer Mungo Park (1771–1806) set out to discover the source of the Niger River. During this first expedition, he encountered bouts of tropical disease, hostile natives, and imprisonment for several months by an Arab chieftain. Nevertheless, he managed to reach the Niger close to its source and follow its course several hundred miles downstream. The American military officer William Minor (1834–1920) received a medical discharge in 1868 because of

bizarre and violent behavior. He later moved to London, where he murdered a brewery worker in 1872. Minor was found not guilty by reason of insanity and was incarcerated for the next thirty years in Broadmoor Asylum for the Criminally Insane. While there, Minor learned about James Murray’s gargantuan project of compiling the *Oxford English Dictionary*, and he became the dictionary’s most prolific contributor, providing definitions for about 8,000 words. American businessman Jules Stein (1896–1981) began his career representing musicians, including Guy Lombardo, in the mid-1920s. Starting with very little capital, he founded Music Corporation of America (MCA), which grew into one of the largest and most profitable entertainment companies in history.

What do these three men with such disparate careers have in common? They were all physicians, although only Minor (the insane lexicographer) practiced medicine for a substantial period of time, first as a field surgeon in the Union Army during the Civil War and later at an Army base on Governor’s Island, New York, where his violent behavior might have been

a symptom of shell shock or PTSD. Mungo Park's only practice experience was a year-long stint as assistant ship's surgeon on a voyage to Sumatra, while Jules Stein practiced very little after his chief residency in ophthalmology at Cook County Hospital in Chicago, although he was a lifetime supporter of eye research and helped found the National Eye Institute.

The three men also share inclusion in David K. C. Cooper's *Doctors of Another Calling*, an interesting collection of brief biographies of physicians (and medical students) whom the editor categorizes as "physicians who are best known in fields other than medicine." This multi-authored collection is unique, I think, for the broad range of non-medical fields it covers and the depth of attention it gives to each of its thirty-eight physician characters. The biographies themselves range from a few that are merely competent to several engaging and incisive portraits.

Aside from Park, Minor, and Stein, who are these famous doctors of another calling? First, they include many of the writers you would expect: John Keats, Oliver Wendell Holmes, Sir Arthur Conan Doyle, Anton Chekhov, and W. Somerset Maugham. This list raises an obvious question: what about Rabelais, Oliver Goldsmith, William Carlos Williams, or Walker Percy? As the editor says, his is a personal choice, so we need not debate his judgment that Abraham Verghese and A. J. Cronin (both included) are, in fact, better novelists than Walker Percy (not included). Other unsurprising entrants are: philosopher John Locke, composer Alexander Borodin, explorer David Livingstone, revolutionaries Sun Yat-sen and Che Guevara, entrepreneur Armand Hammer, and theologian-humanitarian Albert Schweitzer.

What were the biggest surprises? One was the presence of Dante Alighieri, whom I had never associated with medicine. James E. Bailey's chapter on Dante argues that "several lines of indirect evidence suggest that Dante's interest in medicine was more than passing."¹² In fact, Dante did at one point join the Guild of Physicians and Apothecaries in Florence, and several contemporary images portray him in the typical guise of a physician, i.e., red gown with white fur on the hood. However, there is no evidence that the great poet and political theorist ever practiced medicine.

Another surprise was T. Jock Murray's lead-off chapter on St. Luke. There is an ancient tradition in Christianity that the author of Luke's gospel was a physician, although an almost equally respected tradition holds that the gospel writer was an artist, to whom several early icons were attributed. In fact, St. Luke is now the patron saint of physicians and painters. In any case, if Luke was indeed a medical man, he is surely the most widely read physician writer of all time.

I met several new characters in *Doctors of Another Calling* and learned fascinating details about more familiar figures. For example, I became acquainted with Hans Sloane (1660–1753), who studied medicine in London under Thomas Sydenham,

practiced in Bloomsbury, served as president of the Royal College of Physicians, and eventually became physician to Queen Anne and her Hanoverian successors. Sloane's passion for natural history, antiquities, books, coins, and manuscripts led him to amass a great collection of specimens and artifacts that he bequeathed to the nation. This became the nucleus of the British Museum, which opened in 1759, six years after Sloane's death. I was aware that in 1954 Roger Bannister (1929–) became the first runner to break the four-minute mile, but had not remembered that Dr. Bannister went on to have a distinguished career as a neurologist. Likewise, I had read that Edward Wilson (1872–1912) was among the men who perished with Robert Falcon Scott on his return from the South Pole, but had not realized that he was the expedition's physician, as well as its naturalist.

The selection of such a small number of winners in a competition for "best known" is bound to be controversial. I couldn't help second guessing Dr. Cooper from time to time. If he reaches back to the Middle Ages (e.g., Dante), then why not include the great Jewish physician-philosopher-theologian Moses Maimonides? Or what about the French World War I prime minister George Clemenceau? Among medical students, why didn't the famous (or notorious) twentieth-century poet Gertrude Stein, who left Johns Hopkins medical school during her fourth year, make the cut? Her case raises the more interesting question: Why are there no women among the select thirty-eight? Yes, it's true, historical circumstances have restricted the pool of women, both in medicine itself and in various arts and occupations. But it's strange that Dr. Cooper, who has striven to present such a broad range of "best knowns," was not able to find a single woman to include in this book. There are, however, two appendices in which he lists numerous writers, entertainers, explorers, political leaders, scholars, and others who reasonably "might have been chosen," but didn't make the cut.

Doctors of Another Calling is an enjoyable book, full of interesting detail and surprise. It's neither an authoritative reference work, nor a book that many readers will want to sit down and read from stem to stern. Rather, its short chapters allow the reader to take small doses of "physicians best known for their contributions to other fields" on a PRN basis.

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