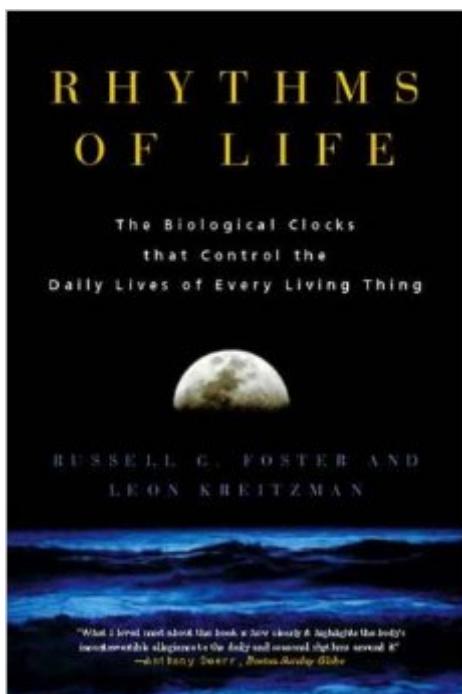


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# Rhythms Of Life: The Biological Clocks That Control The Daily Lives Of Every Living Thing



## Synopsis

Why can't teenagers get out of bed in the morning? How do bees tell the time? Why do some plants open and close their flowers at the same time each day? Why do so many people suffer the misery of jet lag? In this fascinating book, Russell Foster and Leon Kreitzman explain the significance of the biological clock, showing how it has played an essential role in evolution and why it continues to play a vitally important role in all living organisms. The authors tell us that biological clocks are embedded in our genes and reset at sunrise and sunset each day to link astronomical time with an organism's internal time. They discuss how scientists are working out the clockwork mechanisms and what governs them, and they describe how organisms measure different intervals of time, how they are adapted to various cycles, and how light coordinates the time within to the external world. They review problems that can be caused by malfunctioning biological clocks—including jet lag, seasonal affective disorder, and depression. And they warn that although new drugs are being promoted to allow us to stay awake for longer periods, a 24/7 lifestyle can have a harmful impact on our health, both as individuals and as a society.

## Book Information

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## Customer Reviews

What do the disasters of the Titanic, the Exxon Valdez, Chernobyl, Three Mile Island, and the Union Carbide plant explosion in Bhopal all have in common? They involved human error, and they all happened when the humans ought, by biological fiat, to have been sleeping. We are ruled by our clocks now, but even in the unnatural world we have made for ourselves, we cannot get away from the natural clocks that our cells expect us to follow. Like almost all living things in the planet, from

plants to bacteria to birds, we have "a biological clock that was first set ticking more than three billion years ago." In *Rhythms of Life: The Biological Clocks that Control the Daily Lives of Every Living Thing* (Yale University Press), Russell G. Foster, a professor of molecular neuroscience, and Leon Kreitzman, a writer and broadcaster, have examined the investigations of a relatively new science, chronobiology, to show just how much sway natural time has over us and other organisms. It isn't just a tale of sleepy people in control making bad judgments, although cognition and prudence do have their daily cycles. We tend to have babies (natural birthing) in the early mornings, and heart attacks in the later morning, and lovemaking around 10 p.m. Physical coordination, liver metabolism, body temperature, heart rate, kidney function, and much more all are paying attention to the biological clock, and when we jump time zones or do shift work, we do so at our peril. Many of these cycles are specifically examined here, along with the historical hunt for the biological roots of the rhythmicity.

This book about biological clocks can be read on two levels. Much of it is a popular account of time and its physiological effects; it is informative and entertaining for non-scientist readers, and easily intelligible, at least until it enters into technical details. It contains much interesting information about circadian and other rhythms, and their effects in different organisms, starting from the evidence gathered to prove that internal clocks really exist. We can learn, for example, that camels can stand far greater variations than humans in their body temperature, which may rise as high as 41 degrees Celsius (106 degrees Fahrenheit) in the afternoon or as low as 34 degrees (93 Fahrenheit) during the night, and that this is an adaptation to prevent dehydration. *Dictyostelium discoideum*, however, which has surely taught us more than camels have about biological rhythms, is not mentioned. In the context of temporal effects in human medicine we learn that the use of chemotherapy to treat cancer can vary widely in effectiveness according to the time of day at which the treatment is administered, one of numerous examples where the moment of treatment is important. The book concludes with some practical advice on the use of melatonin to combat jet-lag. Biochemists, however, are also interested in reading about the mechanisms that underlie circadian rhythms: if there is an internal clock, its time-keeping capability must be derived from the kinetic properties of its components. The study of these, as revealed by the pioneering work of Britton Chance and Benno Hess from the 1960s onwards, and more recently that of Albert Goldbeter and others, is surely fundamental to any analysis of physiological time-keeping.

Let me begin with a comprehensive ditto to the words of reviewer R. Hardy "Rob Hardy." I could cut

and paste his words here and go away satisfied that I had done my job. In fact, I would heartily agree with almost everything said by every reviewer before me -- with the caveat that everyone's expectations going in shaped whether they or not they were pleased with what they found once they got there. My rating is five stars because the book DID contain the information I wanted to find within its pages - and more. This is clearly not a book for the average self-help reader, nor will someone who is looking for something from a more metaphysical or Eastern medicine perspective be very happy with it. (I appreciate many of those too, btw - but that's not what THIS book is.) If you are looking for a great read in terms of style-verve, you probably won't be thrilled. Even though it is a bit of a "first-person narrative biography" of an exciting period in the sleep-research field, it is stylistically slanted more toward those who are used to reading scientific tomes -- after which, almost anything would be a beach-read. If you read and liked Kandel's *In Search of Memory*, you won't find this book as "easy" or engaging a read, or as filled with personal details, but that doesn't mean it is not worth reading, or dry as dust, right? This is an "information-dense" book from a neuroscientist's perspective, with many passages that you will probably want to underline or re-read to make sure that the content "sticks" (unless you have the sleep field's vocabulary already under your belt). To me, it is well worth the effort to dig a bit for the treasures it contains. Like life, the territory becomes more familiar the longer you stick with it.

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