

"A witty, engrossing journey...brimming with insight."

— *Publishers Weekly*, starred review

THE SECRET PULSE OF

# TIME

Making Sense of  
Life's Scarcest Commodity

STEFAN KLEIN

International best-selling author of *The Science of Happiness*

## Praise for *The Secret Pulse of Time*

“A witty, engrossing journey through the science, culture, concept and nature of time, the latest from German science journalist Klein (*The Science of Happiness*) is a treatise on temporality brimming with insight. . . . Sure to give readers fresh perspective on their everyday lives, Klein’s concepts are well illustrated in copious examples from literature and popular culture, and Frisch’s fluid, flawless translation makes his text as captivating as it is enlightening.”

—*Publishers Weekly*, starred review

“[Klein’s] scientific approach is an important difference between *The Secret Pulse of Time* and pop psychology books that simply tell one how to think and behave. What we’re getting here is good advice validated by cutting edge data and research.”

—*Providence Journal*

“Time [has] new meaning in this book based on aspects of all the sciences.”

—*Desert Morning News*

“Excellent, authoritative reading.”

—*The Midwest Book Review*

“This is not some simplistic ‘how to make the most of every day’ book. . . . Klein does an excellent job of explaining how physiology and interaction with the world and the cosmos itself create our perception of time.”

—*Choice*

“A delightfully readable examination of our society’s obsession with the clock and the calendar. Stefan Klein’s *The Secret Pulse of Time* is a gem in the realm of popular science.”

—*The Advocate*, Pegram, Tennessee

“The author of the best-selling *Science of Happiness* now tackles time, approaching the topic from many angles: physiology of circadian rhythms, psychology of memory and perception of time, and physics of relativistic time. There is a substantial body of work on time management and commentary on the increasing speed at which we live, but this title is unique in addressing questions such as how we perceive time and why we often feel we don’t have enough of it.”

—*Library Journal*

### And Praise for *The Science of Happiness*

“[H]appiness is something you can practice—that you can get better at—not just a passive experience that happens to you. . . . Stefan Klein, PhD, asserts that people are ‘programmed for positive feelings’ . . . and you can strengthen the circuits for positive feelings by seeking out situations that make you happy. In effect, happiness can become a self-reinforcing habit. . . . As for what makes people happy, friendship and love trump money and status.”

—Andrew Weil, MD

The Secret Pulse of

# TIME

MAKING SENSE OF  
LIFE'S SCARCEST COMMODITY

STEFAN KLEIN

*Translated by Shelley Frisch*



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*For Alexandra*

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# Introduction

## *The Discovery of Inner Time*

ONCE IN A great while we experience a magical moment when the laws of time just don't seem to apply: standing atop a mountain, watching the ocean surf, enjoying a creative spurt, or making love. Plans for the future, worries about the present, and memories of the past lose their meaning. Time stands still: the moment envelops all that has ever been and ever will be. Some people report feeling as though the boundaries of their bodies are melting away and they are becoming part of a grander scheme.

Sometimes all it takes is a rousing evening with old friends or a project you're engrossed in, to make the hours fly by as though they were minutes. You've missed the last train, you've gone way past your usual lunch hour, and you didn't even notice while in the thrall of the here and now.

At some point, time is sure to reenter your consciousness; it is a feeling akin to awakening from an exhilarating sleep.

You catch sight of a clock, and the spell is shattered. W. G. Sebald's novel *Austerlitz* powerfully evokes "the movement of that hand, which resembled a sword of justice . . . it jerked forward, slicing off the next one-sixtieth of an hour from the future."<sup>1</sup> Sebald is describing an enormous clock in the entrance hall of the Antwerp railway station, perched

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high up for all to see—where the architects of old churches once placed the eye of God. Every traveler has to fix his gaze on these hands. By the same token, every person—and every object—in the hall is in this clock's line of vision.

No one in today's society can steer clear of clocks. Clocks are everywhere. Life revolves around them. We race from one meeting to the next and muse wistfully about what we would do if we could only find the time. Sometimes we feel as though we are caught up in a whirlwind and fear being swept away, yet we fail to reap the rewards of our haste. Hectic days yield the fewest memories of all—as though the time had elapsed without a trace, and is lost forever.

The authority of clocks has come to seem quite natural. We regard these instruments as virtual envoys of a higher power. The railway station hall of Antwerp is not the only place people submit to the power of two hands moving around a dial high above their heads. More or less consciously, all of us believe that a mysterious cosmic ticking clock molds our lives, taking the form of a second hand on our wristwatches. If we happen to forget the presence of clocks, we later wonder whether this experience was a dream or a reality.

Benjamin Franklin wrote that time is “the stuff life is made of.” But is the time we live by truly identical to the time we read on clocks? Some hours race by, whereas others seem to stretch out almost indefinitely—and all the while the big hand moves like clockwork, the same as ever. It seems as though another, second time is entwined with the time displayed on clocks: a time that originates within us.

## Introduction

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Inner time abides by its own mysterious laws. Why do unpleasant situations seem to be agonizingly slow, yet happy moments speed by? Why do we often get distracted in our finest hours? Why does life go by faster and faster as we grow older?

The only thing we are sure of when it comes to time is that it is in short supply. This is odd because, measured in hours and years, we are richer than people have ever been. No previous generation has had so much leisure time and such a long life span. Still, more than a third of all Americans report that they do not have enough time. And the number keeps growing with each new survey.

These numbers are dismaying in light of new neurological findings: the feeling of being under constant pressure triggers stress. Chronic stress can have a lasting impact on the brain; it is injurious to our health and lowers our life expectancy.

An incessant time bind is insidious particularly because time pressure feeds on itself, and the result is a vicious circle: Once we fear that we won't be able to get all our tasks done on time, we lose our grasp of the situation and things go from bad to worse. A lack of time makes us lose sight of the future, and we find ourselves running behind events instead of shaping them.

Calendars and schedules do little to address the problem, because they register only clock time, whereas harried feelings originate in our consciousness, which is oriented to inner time. It is therefore essential to understand the laws governing inner time.



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The differences between inner and outer time are especially stark when it comes to our personal circadian rhythms. The time displayed on a wristwatch reveals very little about how our bodies go through the day. Some people have to struggle each and every morning to get out of bed and get going; others sparkle with energy at the same hour of the day. The time of day, the sunlight, and even the amount of coffee we drink are relatively the same for everyone, so the contrast must lie within us.

Why is it that some of us can skip from one meeting to the next in high spirits and stay cool as a cucumber, but others moan and groan when faced with a relatively light agenda? Indeed, the “retirement syndrome” is often accompanied by complaints about a lack of time when a person is no longer employed, which quite obviously can only be explained by an internal, subjective sense of time.

The time we read on clocks represents only a tiny segment of what we experience as time in our lives. The second hand deals only with the present; it does not register the past and future, whereas people also live in their recollections, which are, in a sense, time frozen in their memory. What mechanisms transform the time we have experienced into memory? How is it that people can travel back into the past in their minds? And can people really see their lives flash before their eyes at a moment of mortal danger?

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This book explores the hidden dimensions of time, the phenomena that cannot be reduced to minutes and hours. The

## Introduction

focal point is the question as to how the experience of time comes about—and how we can learn to deal with it more mindfully.

The perception of time is a highly sophisticated faculty of the mind that engages nearly all functions of the brain, encompassing physical sensation, sense perception, memory, the ability to craft plans for the future, emotions, and self-awareness. If even one of these mechanisms is incapacitated, our ability to gauge time gets distorted or even lost. To explore the origins of our sense of time is to embark on an exciting journey through consciousness: In the process, we see a reflection not only of our nature, but also of our culture. Some of the ways in which we perceive the passage of minutes and hours are hardwired, but many more are learned behavior.

When Europeans and Americans form a visual image of time, they picture bygone days as behind them, and the future as approaching from the front. But an Amerindian group in the Andes highlands pictures the spatial dimension of time just the opposite way. When the Aymara are asked about the past, they point forward, evidently because they have already seen the events of the past. By contrast, since the future cannot be seen, it lies behind their backs. The American cognitive psychologist Rafael Núñez was given these explanations when he conducted an in-depth study of Aymara language and gestures.<sup>2</sup> The implications of their outlook on time are reflected in their lack of interest in picturing the future: since it is invisible, it is not worth speculating on. They dismiss any questions about tomorrow with a shrug of the shoulders. And they maintain an admirable

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sense of equanimity when waiting half a day for a bus, or for a friend who arrives way behind schedule.

Consequently, a study of time needs to examine the ways in which our upbringing, environment, and genes interact in shaping our personalities. Our attitude toward time has a bearing on how we perceive it.

Nature has a relatively limited role in determining how we experience time. It is up to us to decide how to fill our hours—and how to shape the rhythm of our lives.

• • •

Most people picture time as a force apart from them, flowing somewhere out there. Either time is available or it is not, and they simply have to adapt to its exigencies. I would like to propose a different perspective. The phenomenon we experience as time derives not only from the outside world, but also from our consciousness. Our perception of time is an outgrowth of the interaction between our environment and our brains. New scientific methods have enabled us to investigate how the outside world meshes with our inner life. Current brain research is yielding insights that may transform our perception and our behavior.

This perspective follows from my earlier books on happiness and chance, and is a natural extension of my interest in these topics. In *The Science of Happiness*, I attempted to demonstrate that feelings of happiness are far less dependent on external circumstances than we normally assume. The crux of our happiness lies in how the brain interprets

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events, and this interpretation is subject to modification. Neurobiologists have recently begun to recognize the extreme plasticity of the brain, and how the cluster of gray cells in the head is subject to transformation. Hence, the proper training can enhance our capacity for happiness. In short: happiness can be learned, and so can a calm and mindful way of dealing with time.

My last book, *All a Matter of Chance*, urged readers to embrace the unexpected. Chance events offer us opportunities. Of course, we can recognize them as such only if we are fully receptive to the present—a central topic in this book as well.

Chance events make us aware of the direction in which time travels. We know the past, while the future is shrouded in darkness and delivers one surprise after another. Time and chance are inextricably linked. As the philosopher Johann Gotthelf Herder astutely observed, “The two greatest tyrants on earth [are] chance and time.”

Recent scientific advances reveal that chance events are anything but tyrannical; in fact, they are essential to the development of our minds. Time can also work to our benefit. Our sense of time is such a highly developed function of our brains that we have great power to influence the direction it takes. Our awareness of the passage of time is by and large learned behavior, even more so than the mechanisms that control our sense of happiness.

This book aims to demonstrate our active role in crafting our perceptions of time. Its three parts examine the workings of time in increasingly broad contexts. The first part explores the origins of inner time and the processes in the