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It's the Thought That Counts

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ALBERT EINSTEIN

A Biography

By Albrecht Folsing

Translated from the German by Ewald Osers

Viking. 882 pp. \$ 34.95

THE INTELLECTUAL revolutionaries of society, according to a new study, are more likely to be later-borns. Albert Einstein belies that dictum. A firstborn son, he was born to rebel. He apparently didn't talk until the age of 3, stubbornly waiting until he could speak in complete sentences. Later, he broke all the rules (and even a few hearts) on his way to refashioning the laws of space and time. With this massive biography, ably translated from the German by Ewald Osers, Albrecht Folsing shows us a man who could be outwardly simple, even peasantlike at times, yet remain inwardly shrewd and complex.

In this age of revisionism, the titans of both art and science are toppling off their pedestals, as historians reexamine old evidence and unearth new materials. Einstein, the physicist who turned a formula, $E = mc^2$, into a trademark, is no exception. The prevailing image of Einstein has long been that of the venerable elder, the Chaplinesque figure with baggy sweater and fright-wig coiffure. Folsing offers a provocative portrait less familiar to the public: the youthful Einstein at the height of his scientific prowess. We see a man whose limpid brown eyes, wavy hair, sensuous mouth, and virtuosity on the violin aroused attention, especially among women. One acquaintance compared Einstein's demeanor to that of a young Beethoven, full of life and laughter. Yet, like the great romantic composer, this century's most celebrated scientist also had his dark side: He was a loner, a sharp-tongued cynic, a self-centered man who could serve humanity yet express little empathy for the problems of those close to him. When the younger of his two sons was hospitalized for schizophrenia in 1933, Einstein made one visit and never saw him again.

What remains untouched and immutable, amidst these personal revelations, is the overwhelming import of Einstein's insights on physics. His key amendments to the cosmic code were exceptionally perceptive, and Folsing traces their roots to Einstein's childhood musings.

Albert Einstein was born in 1879 into a non-religious Jewish family, one well assimilated into the culture of southern Germany for more than two centuries. His father ran, with mixed success, an electrical engineering company, the high-tech business of its time. Growing up with his younger sister Maja, little Albert loved doing puzzles, building

structures, and most especially solving geometry problems, the very key to his later work. And he didn't suffer fools gladly: He dropped out of gymnasium (German high school) due to conflicts with a teacher, among other reasons.

Fortunately, he was able to enroll in a Swiss university, Zurich Polytechnic, where he met his first wife, Mileva Maric, a fellow physics student. Folsing discusses the recent disclosure that garnered news headlines: the daughter born to Mileva and Einstein before their marriage and then given away, her fate unknown to this day. But he refuses to deal with the rumors that Mileva contributed to Einstein's special theory of relativity. Such claims are simply "devoid of any foundation," the author curtly declares in a note at the back of the book.

Einstein turned cold and indifferent in wedlock, which drove Mileva to fits of melancholia and jealousy. Einstein found comfort with his cousin Elsa, who became his second wife (but not his last romantic fling). While Folsing is not shy in airing these domestic episodes, he has carefully chosen to stress Einstein's work instead. In this regard, Folsing, who was trained in physics and now heads the science department of a German broadcasting network, is painstaking and thorough in his research, taking us step by step through the crystallization of Einstein's thoughts and his interactions with the leading physicists of the era. "Physics was at the core of his identity," contends Folsing, "and only through physics can we get close to him . . ."

Physics was at a critical juncture at the turn of this century. X-rays, atoms and electrons were just being discovered. And it took a rebel -- a cocky kid with mediocre grades in college, no academic prospects, but an unshakable faith in his own abilities -- to blaze a trail through this new territory. He preferred self-learning and followed the scientific literature religiously. Fearless at challenging the greats of his day, even as a student, he was sure that the prevailing theory of electrodynamics did not "correspond to reality . . . that it will be possible to present it in a simpler way."

His work as a Swiss patent examiner, the only job he could find after college in 1902, turned out to be a blessing. Free of academic pressures, Einstein could maintain an "independence of thinking," according to Folsing. And by 1905, like a dormant plant that suddenly flowers, he burst forth with four papers, any one of which could have garnered a Nobel Prize. He unmasked the particle nature of light (the Nobel winner), explained Brownian motion, found a means of measuring the size of atoms, and last but not least revealed his special theory of relativity (actually rejected as a doctoral thesis for being too speculative).

Folsing skillfully examines the precursors leading Einstein to special relativity. Einstein's genius was his powerful physical instinct, a sixth sense for knowing how nature must work. He keenly cut through the confusions then prevalent by realizing that time is not absolute, as Newtonian physics long assumed. And this leads to some interesting effects as an object approaches the speed of light: Time slows down, length shortens, and mass increases. "There is no other theory whose eventual experimental confirmation," writes Folsing, "was received with greater indifference -- simply because no one had expected anything else."

Special relativity, though, deals only with objects moving at constant velocity; almost immediately, Einstein wanted to generalize the theory so it could describe all types of motion. In doing this, he waged a mental war, one that went on for years amid teaching responsibilities, a failed marriage, a growing love affair, and World War I. Early versions of a general theory of relativity were published and then discarded. "One might be tempted to present it as a comedy of errors, though of course on the very highest plane," notes Folsing wryly. Triumph came in 1915. Einstein had taken the four-dimensional space-time continuum and warped it, at last explaining the very origin of gravity. A falling object is simply following the curvatures that a mass indents within the pliable mat of space-time. Even though the general public little understood such concepts at the time, the name Einstein became a household word. He was fawned over like a Hollywood superstar wherever he went, a state of affairs he deemed "a dazzling misery."

IT WAS SAID that Einstein's lectures were "always very fine, but not for beginners." Folsing, too, writes for a scientifically sophisticated audience, one that must be at home with terms like entropy and Galilean transformations. Moreover, the author rarely zooms out from his tight focus on Einstein, denying the reader a fuller background on the politics and new physics of the time. Yet such an approach can still serve as a valuable resource. Einstein looms large,

making it difficult for any one biography to be everything to everyone. As a chronicle of Einstein's scientific achievements, Folsing's biography is commendable.

Success for Einstein was a curse, in a way, and not only because his intellectual intensity was disrupted. General relativity, a triumph of mathematical reasoning, led him to believe that "pure thought is capable of comprehending reality." He spent the rest of his life, some four decades, attempting to merge electromagnetism with gravity in one unifying theory, for him a lost cause. He was sure the uncertainties inherent in quantum mechanics, the rules of the atomic world, would vanish once he succeeded. Folsing allows us to see that Einstein was hardly an obstinate grump in this business, as some perceived it; it was just the one time that his intuition failed him.

Einstein was a man of contradictions. He was a humanitarian, yet a lone wolf who admitted he lacked "a need to attach himself . . . to individuals." He was a pacifist who defended the infamous show trials in the Soviet Union during Stalin's reign of terror in the 1930s and invented a gyrocompass used in World War II military ships. Einstein was quite aware of his faults. "What is essential in the life of a man of my kind," he once said, "lies in what he thinks and how he thinks, and not in what he does or suffers."

At times engaging, often challenging, Folsing's biography helps us understand that wisdom. It is Einstein's physics that will live on for millennia.

Marcia Bartusiak, a contributing editor of Discover magazine, often writes on physics and astronomy. Her latest book is "Through a Universe Darkly."

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GRAPHIC: Photo, from "albert einstein", Albert Einstein in 1906 at the Swiss Patent Office in Bern and in 1952 on NBC television

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