

FROM SUNDIAL TO GPS

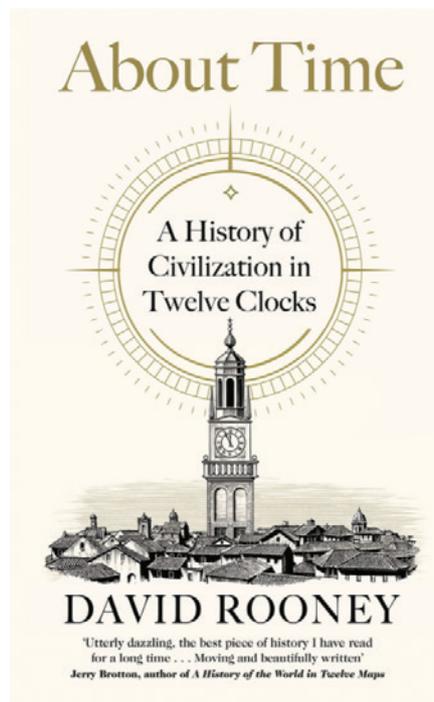
How instruments of time control us

BY CHARLES R. MEYER, MD

During my years in practice, I answered to many masters—insurance companies, Medicare, hospital bylaws. But the dominant ruler of my days was attached to my wrist. My watch was a potent presence that told me how my day was going, whether I was keeping up and measuring up, a nagging force that was unspoken but omnipresent. Clocks and the time they keep are the silent adversaries in a physician's day. David Rooney, historian and former curator of the Royal Observatory in Greenwich, England, has compiled an insightful history of that adversary that can help a doctor understand what they're up against.

Since childhood, I have nurtured a fascination for clocks and time. Trained as an engineer, my father obsessed about accurate time, investing in expensive Rolex only to replace those with cheaper but more precise electronic watches when they became available. Probably because he was always talking about “hacking” your watch, a term of obscure origin, I too focused on time pieces and time. I was given my own Accutron as a high school graduation present. As I was discovering ham radio, I found WWV, the radio station of the National Institute of Standards and Technology, which broadcast monotonous beeps interrupted by a voice intoning time precision: “At the tone, the time will be exactly...” During decades of seeing patients, I rarely went without a watch and I developed a sixth sense about what time it was and obsessively worried about whether I was running late.

Rooney dates similar obsessions with time to the advent of sundials, introduced in Rome by Valerius in 263 BCE. As sundials proliferated, they changed people's lives by making them more aware of the passing of time and quantifying that passing. He quotes a playwright of Valerius' day who complained that “The gods damn that



About Time: A History of Civilization in Twelve Clocks
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man who first discovered the hours, and—yes—who first set up a sundial here, who's smashed the day into bits for poor me! You know, when I was a boy, my stomach was the only sundial, by far the best and truest compared to all of these. It used to warn me to eat, wherever—except when there was nothing. But now what there is, isn't eaten unless the sun says so. In fact town's so stuffed with sundials that most people crawl along, shriveled up with hunger.” Early Romans had acquired a master that governed their days, but this was soon supplanted by a 24/7 despot, the water clock, which didn't require the sun.

Rooney journeys from water clocks to acoustic clocks to mechanical clocks to pendulum clocks. In every era he finds that public clocks “mounted high up on towers or public buildings have been put there to keep us in order, in a world of violent disorder.” He sees clocks as govern-

mental instruments of control delivering the message, “know your place; stay in line; obey your rulers.”

And not only political rulers. As electricity invaded society and facilitated networking of clocks across geographical boundaries to create a standard time, clocks ran the railroads, closed bars and guided financial deals dictating “when you wake up, when you go to bed, when you can and cannot buy alcohol, how long you are allowed to work in factories and shops, how much daylight you get in summer when the days are longer, how easily you can travel to other places.”

Rooney fears that this control is not only sometimes irritating but also dangerous, epitomized by the atomic clocks at the heart of the global positioning system (GPS) that rules navigation, telecommunication, power grids and data transfer and which is susceptible to jamming and an attack called spoofing that can fool GPS localization by miles. Incidents such as these have already occurred, leading one politician to identify GPS as a “single point of failure of the modern economy” and another to predict that in a widespread GPS outage “people will die.” Tiny electronics thousands of miles away run our world.

The clocks that run a physician's day aren't as potentially lethal as a GPS malfunction, but every practicing doc knows that a failure to listen to the tick-tock of his master can lead to unhappy patients and frustrated staff. Having no wall clock in my exam rooms, I preferred to listen to my internal tick-tock and hope that patients were in the same zone, feeling that I had given them enough time. MM

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