



Till Tomorrow

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There is a moment in James Gleick's lively book on time travel where he notes how few are the variants for titles of books on the subject:

As the time-travel express got going, in the second half of the twentieth century, publishers must have had a panicky realization that they were using up all the possible titles. They run together in the mind: *Time and Again* — *Time After Time* — *From Time to Time* — *Out of Time* — *A Rebel in Time* — *Prisoner of Time* — *The Depths of Time* — *The Map of Time* — *The Corridors of Time* — *The Masks of Time* — *There Will Be Time* — *Time's Eye*. At least four novels have been titled *Time After Time*.

That's not even to mention Cyndi Lauper! Title-wise, Gleick has wisely opted for the straightforward *Time Travel: A History*, which is perfectly descriptive for a history of the idea of time travel in culture and science. Alan Burdick strays into riskier territory with *Why Time Flies*, only a terminal question mark away from images of officials with stopwatches loitering around rotting carcasses. And one wonders if Raymond Tallis's *Of Time and Lamentation* deliberately apes the title of a famous work by another Tallis—Tudor composer Thomas Tallis's *Lamentations of Jeremiah the Prophet*.

It is a strength of all three of these books that they flesh out the specifically *human* aspect of time. Physicists' models of manifolds and

*Of Time and Lamentation:
Reflections on Transience*

By Raymond Tallis

Columbia ~ 2017 ~ 726 pp.

\$40 (cloth)

Time Travel: A History

By James Gleick

Pantheon ~ 2016 ~ 336 pp.

\$26.95 (cloth)

Why Time Flies:

A Mostly Scientific Investigation

By Alan Burdick

Simon & Schuster ~ 2017 ~ 301 pp.

\$28 (cloth)



spatio-temporal geometries, whatever their utility, are largely alien to the day-to-day experience of living “in time.” Indeed, Tallis builds his argument around the claim that modern physics actively distorts how time works on a human level. And both Gleick and Burdick structure their books around human stories and human points of view.

“Human,” though, can be an over-leveling term. In fact, humans come in all sorts of different varieties. We only go so far if we replace the neutrally inhuman perspective “science” with the neutrally generic perspective “human.” All of us are shaped by our situations, our cultures and opportunities; and all of us exist in history, too. So I will here mount an argument for the usefulness of considering time from certain more particularly human perspectives, ones not considered in any of these books: farmers and hunter-gatherers. After all, how “we” perceive time is always going to depend upon the sort of people “we” are.

T*ime Travel*, the latest work by James Gleick (pronounced “Glick”) is a pleasingly varied compendium. It mixes accounts of the most famous fictional accounts of time travel—H. G. Wells’s *Time Machine*, spoiler-heavy summaries of Robert Heinlein’s “By His Bootstraps,” Isaac Asimov’s *The End of Eternity*, the BBC’s *Doctor Who*, and the other usual sci-fi suspects—with readings

of T. S. Eliot, Marcel Proust, and William James. In between the book reports are lower-calorie accounts of the physics of time as presently understood; philosophical discussions about causality, free will, language, consciousness, and time paradoxes; and an interlude on the craze for burying time capsules.

The whole thing is written with more charm than precision. For example, it’s odd that a study dedicated to Wells’s famous book refers to “the troglodytic Eloi and bovine Morlocks”—those adjectives are the wrong way around. Presumably that’s a slip, as is Gleick’s claim that “No one knows exactly what [ancient Greek philosopher] Heraclitus said, because he lived in a time and place that lacked writing”—Greeks were writing for at least two centuries before Heraclitus, and we have fragments of Heraclitus because he did write a book (*On Nature*), which was in turn quoted by other writers before the original was lost to time.

Nobody but a heartless pedant fusses about such things, and Gleick certainly has a natty turn of phrase: “every death is an obliteration of memory”; “without randomness”—that is, entropy, the tendency of physical systems to become more disordered over time—“the clocks could run backward.” He’s a witty writer who chucks a great quantity of fascinating data at the page. Much of that data sticks.

But the deluge of information also makes for a book that takes the

reader on a whirlwind tour to... well, to nowhere in particular. “We do seem to be traveling in circles,” he notes toward the end with a rather winning honesty. And his reply to his own question, “What is time?”—“Things change, and time is how we keep track”—really isn’t much of an answer.

There is a larger problem with this book, which I will dilate upon. By starting with Wells’s Time Traveller and returning to him often, Gleick effectively frames the whole subject of travel into the future as beginning with Wells. Almost all of Gleick’s examples are from the twentieth and twenty-first centuries. Indeed, one of the book’s core arguments is that the turn from the nineteenth century to the twentieth radically shook up how we think of time—“time travel, the concept, is barely a century old.”

Gleick is not alone in arguing that time travel is a distinctly modern literary conceit. This idea is common among writers on the subject. Darko Suvin, in *Metamorphoses of Science Fiction*, argues that the “central watershed” of the development of science fiction was around 1800, when stories started being set not only in other places but also in other times. Placing the turn a touch earlier, Paul Alkon, in *Origins of Futuristic Fiction*, argues that “the impossibility of writing stories about the future was so widely taken for granted until the eighteenth century that only two earlier works of

this kind are known”—an English propaganda pamphlet and a French romance, both from the seventeenth century.

As I have described in *The History of Science Fiction*, there were in fact a number of pre-eighteenth century works that offered speculative questions about the future, or even visions of what it might look like, albeit that these were not quite stories set *in* the future. But more to the point, this literary history is only a step away from claiming that the ability to imagine the future *at all* is a very recent development in human history.

So, on the rare occasions when Gleick refers to the world before Wells, he paints it as a kind of dreamy temporal stasis: Shakespeare, “who traveled freely to magical isles and enchanted forests, did not—could not—imagine different *times*. The past and present are all the same to Shakespeare: mechanical clocks strike the hour in Caesar’s Rome, and Cleopatra plays billiards.” Thomas More’s *Utopia*, meanwhile, “was just a faraway island. No one bothered with the future in 1516. It was indistinguishable from the present.”

If Gleick really believes this, he is inviting the response: “Don’t be silly.” In 1513, three years before Gleick claims no one was bothering with the future, Machiavelli was urging that “all prudent princes... have to regard not only present troubles, but also future ones, for

which they must prepare with every energy.” And as for the poor Bard, stuck on a magical isle in the perpetual now:

We all were sea-swallow'd, though
some cast again,
And by that destiny to perform
an act
Whereof what's past is prologue,
what to come
In yours and my discharge.

It's difficult, actually, to discern whether Gleick literally believes that nobody who lived prior to recent centuries was capable of imagining the future. Later he seems to use “the future” in the sense of *futurism* or the *futuristic*: “Through most of history, the world people imagined their children living in was the world they inherited from their parents.” Only recently did there arise “a sense of the future as a notional place, different, and perhaps profoundly different, from what has come before.” What happened? The printing press and the Industrial Revolution created the first moment in history in which people “witnessed vast transformations within their lifetimes.”

So this future, the one Gleick is talking about, is a quite recent technological invention. There is a peculiar irony here: Gleick, who scolds Shakespeare for being stuck in the present, is so attached to our present ideas that when he encounters past views of the future he denies

that they count as “the future” at all. If the difference were not framed so absolutely, Gleick would surely be on to something—nobody could gainsay the observation that, at the very least, stories about the future are very common today whereas a few centuries ago they were not. In the hands of a less breathless writer, this might have led to a more fruitful discussion about how our “temporal sentience,” as he puts it, differs from our ancestors’.

But the larger claim is dotty. Can you *really* imagine any population of human beings living their lives wholly incurious about what next week, or next year, might bring, or thinking that it won't be different? Think through the practicalities: How could anybody have planned anything, stored grain for the winter, calculated the interest on loans, or mustered armies, if the future truly were indistinguishable from the present?

And this brings us to hunter-gatherers and farmers. It is certainly possible to imagine our hunter-gatherer ancestors living in some bestial, continuous present of consciousness, their experience of time pricked out with moments of intensity—the chase, the kill, the satisfaction of a full stomach—but indifferent to the distant future.

But it is quite impossible to imagine farmers prospering in such a frame of mind. Once we humans began to depend on planted crops

and domesticated animals, our new mode of life absolutely required us to think ahead: to anticipate setbacks and think through solutions, to plan, to map out the future world—indeed, many potential future worlds.

Time travel as mental exercise must have begun at least that early. And that makes this focus on recent modernity look a little parochial. We are not so special. Indeed, thinking in this way of the future's origins might make us rethink some of the metaphors we use to articulate our sense of time. Gleick is good on the limitations of these figures of speech—for example, time, as he shows, is not really “like a river.” Farmers, the original time travelers, are likewise prone to think of rivers not first as modes of transport but means of irrigation. Might time be the same for us—not a vehicle for taking us somewhere, as a horse is to a hunter, but a resource to make fertile what we have and hold dear?

This view would imply that science fiction is at root a *farming* literature. And that shouldn't be such a surprise. Think of science fiction writers' predilection for world-building: the careful mapping out of imagined societies, territories, mores, technologies, languages. Surely that's a way of proceeding that has much more to do with farming than with hunting and gathering. Many writers who focus on Wells know how fond he was of cycling, and note that his Time Machine had a saddle. They

encourage us to think of the machine as a bicycle. But perhaps we should think of it as a different sort of saddled machine—a tractor.

Taking a similarly unfarmerly approach to writing about time is Alan Burdick, who has hunted and gathered all sorts of interesting experimental data concerning human perception and processing of time. Burdick combines a personal memoir of the first years of the lives of his twins Leo and Joshua with scrupulous, if journalistic, accounts of the various experiments people have undertaken into the subjective experience of time. Any parent will recognize Burdick's account of his first few weeks as a father:

We all slept so little and so irregularly that my working memory dissolved. I can recall watching *The French Connection* several times after midnight while bottle-feeding two infants but even now I couldn't tell you the plot; there was a man with a beard, a subway chase, Gene Hackman in a porkpie hat.

Actually not a bad summary of the film, I'd say. But you take his point.

Why Time Flies scores high on two fronts: as an account of the ways mankind has attempted to fit the concept of time into increasingly fine-grained and abstracted varieties of clock time, and, relatedly, as an account of how we humans perceive

time in our own minds. Most fascinating were the accounts of people who deliberately disrupted their circadian rhythms by, for instance, spending months in subterranean caverns. Burdick is entertaining on how weird people get under these circumstances, and interesting on how tied to the daily cues of daylight our sense of time is. Light, he argues, is the universal clock.

A farmer might have planted all these fascinating nuggets in neat rows. Hunter-gatherer Burdick heaps them, instead, into four big piles, from which he invites the tribe to pull out what it will. There is a section called “The Hours,” which is loosely about clocks; “The Days,” about calendars; “The Present,” on the meaning of “now”; and a final one called “Why Time Flies,” which considers the ways people at varying stages of their lives perceive time’s passage. But the book dances back and forth among subjects, the same notions pop up intermittently but disjointedly, and there’s too little overarching narrative momentum to hold everything together.

As with Gleick, Burdick’s focus is overwhelmingly on the twentieth and twenty-first centuries, with occasional glances back to William James and to Augustine’s *Confessions*. We learn about all sorts of recent experimental work—on how animals perceive time, the differences between babies’ and old people’s tense-senses, and the way emotions influence time percep-

tion. It is never actively uninteresting, although there is quite a lot of it, all minutely rendered, and eventually it starts to clog.

More broadly, although this book contains a great deal of specific detail relating to Burdick’s own life and children, there is almost no sense of *him* as a person. The book has the form of the memoir without actually disclosing anything about the memoirist, as if there is a reticence at the heart of what he is trying to do. Just when the reader has the feeling of getting closer to what might be at stake for our narrator in the question of time, he retreats behind a slab of exposition:

I wake in the dark to a cry. It’s Leo, hungry. What time is it?... With the aid of some twenty thousand clock cells and some specialized neurons in their retinas, Leo and Joshua have metabolized the daylight of almost their first three hundred and sixty-five days.

The book’s broader thesis, such as it is, is that time is much less objective and much more “scaled and fungible” than we tend to think. It’s hard to argue with that. But although Burdick is very good on a particular kind of anthropological or psychological experiment, he has far less of a grasp of philosophy:

Central to [Heidegger’s] argument is an amorphous concept

that he calls *Dasein*....(My own feeling is that if you have to cook up another word in order to define time, you aren't helping much.)

One needn't be a card-carrying, toothbrush-moustache-wearing Heideggerian to object to that thumb-nail summary. Whatever else might be said about *Dasein*, "amorphous" is exactly the wrong word to describe it. This kind of airy dismissal strikes a bum note, as does Burdick's summary of Kant as one who simply believes "we can somehow intuit the a priori nature of time," which is careless to the point of negligence.

While metaphysics is not the focus of Burdick's book, it's hard to see how even the most tentative treatment of why time flies can afford to neglect what the greatest philosophical minds have said. One small example of where Burdick could have profited from real attention to Kant can be seen in how he comes away from a meeting with British academic psychologist John Wearden, struck that

we don't perceive time directly, as we do with light or sound. Light we perceive by means of special cells in the retina which, when struck by photons, trigger neural signals that quickly reach the brain. Sound waves are detected with tiny hairs in the ear; their vibrations translate into electrical signals that the brain grasps as audio. But we don't have special

receptors for time. "The problem of the organ for time has haunted psychology for many years," Wearden said.

It hasn't haunted Kantians, though, who understand time and space as the forms framing our senses rather than stimuli *in* the external world to be sensed in themselves. Burdick might just as well have pondered how strange it is that we lack special receptors to perceive height. One could reply: Don't we perceive height with our eyes? But this reply won't do, or else we could also say that, since we can sit and watch paint dry, we perceive time with our eyes. Seeing a six-foot-eight man is perceiving one manifestation of height in the world, just as watching paint dry is observing one manifestation of time in the world. But in neither case are we perceiving either height or time directly. And, a Kantian might say, when you put it like that you can see that those looking for an "organ for time" are framing the question in the wrong way.

But for all his philosophical shortcomings, Burdick has dug down deep into one narrow seam of the ways in which time is being researched nowadays. If you're looking for an account of the psychology of time, you could do worse than this book.

Raymond Tallis's monumental *Of Time and Lamentation* is a quite different sort of project compared to

these other two books. It is a massive and often astonishing magnum opus, the product of decades of scrupulous, far-reaching, and detailed engagement with a huge range of interlocking disciplines, from medicine and psychology to physics, history, theology, and philosophy. It asks the biggest questions, and offers big and challenging answers. Tallis is renowned as one of the most poly of contemporary polymaths, and in *Of Time and Lamentation* he has produced the sort of book that absolutely requires to be read closely and digested over time. [Editor's Note: Tallis is a contributing editor to this journal, and an essay adapted from the book previously appeared in these pages: "The Time of Our Lives," Winter 2017.]

One of Tallis's strengths as a writer and thinker is his intellectual hospitality. He presents this book, huge though it is, not as a summation of thoughts about time, but rather as "an argument with myself" about time and mortality, laid out so as to render its claims open to "auditing" by the reader.

A hunter-gatherer is liable to think of space as something to move through to reach a specific goal—to track down and kill the antelope, to locate the tastier nuts or the accessible honeycomb. A farmer is obliged to think of space as something to be mapped and plotted, something to be curated and checked, something to be worked over and maintained.

In that respect, Tallis as a writer is very much more farmer than hunter-gatherer.

So, although it is both lengthy and dense, *Of Time and Lamentation* is a book that has been carefully planned, its main structure and central ideas curated over time and everything arrayed to help the reader navigate its landscape. The core project of the book is "rescuing time from the jaws of physics"—that is, time as theorized by contemporary science—while taking care not to fall into supernatural pseudo-explanations.

There are three big fields on Tallis's farm. One, called "Killing Time," analyzes the way physics and mathematics have conceptualized time in terms of one or another species of odometry. Tallis explicitly sets out to demolish the notion that time is just another dimension of space, unpacking concepts like "the arrow of time" and challenging notions of clock time as an "objective" temporal measurement. At the same time he concedes that clock time—which is ultimately just the counted repetitions of some part of the universe, whether a swinging pendulum or a vibrating quartz crystal—is a more complicated business than he can cover, even in a book as large as this.

In Part II, Tallis mounts a vigorous "defense of tense"—that is, a response to the assumption of modern physics that reality is "tenseless," since ideas like *before*, *now*, and *after* are all merely relative to the position

of observers. This part, too, is so detailed and wide-ranging as to repel facile summary. But one of Tallis's points is that, since tense is integral to the way human beings perceive and conceptualize time, a physics that tries to dispense with tense will have a hole at its heart—us—which must fatally limit it. It is only with tense that we can say anything about “impatience, endurance, waiting, and hope.... the time of flesh and blood individuals living their lives.”

In the final part of the book, Tallis attempts “to see time as it really is.” He does what neither Gleick nor Burdick do, engaging at length with some of the most influential metaphysical theories of time. He disposes of Kant and Heidegger to his own (if not to my) satisfaction, but expresses a qualified regard for Henri Bergson, whose work has “obvious points of convergence” with his own. And he concludes with “possibly the most important purpose of this exploration of time,” an account of free will. Tallis's conclusions root time in our existence and experience. Both of those are located in a universe that is vastly older and bigger than us, and that constrains, but crucially does not extirpate, our freedom to choose how to live and act.

Throughout, Tallis writes clear, expressive prose, only occasionally slipping into ornateness or leavening his lump with slightly ponderous playfulness: “Time is mysterious; tea-time doubly so”; “Thus does

maintenant” (French for *now*) “slip through our *mains*” (*hands*). Tallis, though always courteous, is never prepared to nod through another thinker's intellectual delinquency, as he sees it. If your patience is tried by a lengthy itemization of all the places where one professor thinks another professor's massive argument is not quite right, you'll find stretches of the book hard going—and I'm afraid, as a professor reviewing another professor's massive argument, I'm now going to try your patience further.

A persistent refusal to be bamboozled, to retreat into fashionable jargon, or to fall into any kind of mystical cloud of unknowing has always characterized Raymond Tallis as a thinker. His approach is resolutely commonsensical. But time is perhaps the greatest challenge he has faced to this *modus operandi*.

As Tallis's honesty compels him to admit, there are aspects of time from which the wisps of unknowing simply can't be blown away. “Mysterious” and its cognates chime through the prose, and the book's final sentence before the epilogue strikes a tone of low-rent Shelleyism:

Between the darkness of the womb and that of the tomb, our life arcs through the light, and we exercise our mysterious capacity to shape, define, and enact ourselves, as beings both inside and outside of time.

Tallis's suspicion of our tendency to metaphorize or even to visualize time is salutary, and he is eloquent and persuasive on the ways that metaphors inevitably distort. (Although, of course, neatness is also prone to distort—is also, in its way, a kind of metaphorical apprehension of things.)

One common metaphor that Tallis picks apart is the image of time as a dimension, along with the spatial dimensions. The concept of *spacetime* even allows these four dimensions to be visualized directly, as, for example, in diagrams of “light cones.” Tallis denies the idea of spacetime, and by way of counter-argument discusses various ways that time and space don't seem to be different kinds of the same thing: There are three spatial dimensions but only one temporal one; there are constraints on how we move in time that don't apply to space; there are constraints on the *sequence* of events that hold temporally but not spatially—“there is a temporal ordering of visits to the same point in space but not a spatial order of times of visits”; and finally, we can imagine that time flows, but not that space does. The flow of space

would be a rather odd thing for a dimension to get up to. Up-down, etc. don't move through space. How could they when they are (aspects of) space? Nor do portions of space move through space. An object a kilometre long

may move closer but we cannot think of a kilometre (or a cubic kilometre) coming any nearer.

This will strike physicists as an odd sort of objection. They would insist that, since the Big Bang, space has indeed expanded at a prodigious rate, and to a prodigious size. Space moves, curves in the presence of gravity, and gets up to all sorts of things we might as well describe as flowing. But Tallis later critiques the notion of “curved” spacetime, so this retort likely would not persuade him.

Tallis's other objections, though, are less idiosyncratic. Plenty of people have believed that time is fundamentally different from space for the common-sense reason that, while I can go back to Canterbury, where I grew up, I cannot go back to 1980, when I was growing up. Believers in spacetime might say: This happens to be true of me, and happens to be true of Tallis, but these may be particular rather than universal circumstances. Perhaps given the right equipment, which I happen not to possess, I *could* go back to 1980. This objection would be as if a man in 1700, considering that he personally could not travel at a hundred miles per hour, decided that a hundred miles per hour is therefore a radically different sort of thing than ten miles per hour. But Tallis devotes considerable attention to a series of arguments against the possibility of time travel, so this line of thinking is also unlikely to persuade him.

Still, there are other arguments that address what Tallis calls “dis-analogies” between time and space. For example, we can imagine circumstances where movement in space would be exactly as constrained as our apparent movement in time. A body that has passed the event horizon of a black hole would move in space just as forcefully and unalterably as our bodies “move” in time. In such a situation the dimensions of space would better harmonize with the dimension of time.

I once wrote a science fiction story (“What Did Tessimond Tell You?”) predicated on this idea. In it, our physical universe has crossed the event horizon of a temporal black hole. The premise of the story is that the reason we feel time to be passing is that everything in the universe is being time-accelerated towards a very massive temporal “object” located in a certain place in the spacetime manifold. We can’t “move around” in time for the same reason a physical observer couldn’t “move away” from a black hole once she’s passed the event horizon. This time acceleration is constant, giving us a sense of one second passing every second (it has to be temporal *acceleration*, of course, or we wouldn’t have the sensation of moving forward at all).

The story speculates as to what’s likely to happen when we collectively collide with the temporally supermassive object that is drawing us (nothing good, obviously). It

also proposes that, just as an object accelerated close to the speed of light experiences time dilation effects, an object accelerated close to the ultimate speed of time would experience space dilation effects: namely, what we see all around us, the massively expanding universe in which we all live. If this speculative account is anything like reality, then a good portion of Tallis’s discussion would be rendered null.

This is fanciful, of course, and it may well strike the reader as implausible, but the important thing is that it is perhaps not impossible. To quote Tallis himself, it is “*physical possibilities*” on which we must concentrate, “not convenient or sensible ones.” But I suspect that Tallis would object that such speculation does nothing to mediate between physics on the one hand and our intuitions and perceived reality on the other. His core interest in *Of Time and Lamentation* is the human experience of time. It’s just that he wants to situate that experience in a rigorously thought-out, comprehensive physical theory of time as such, because he believes in a material universe.

Which is fair enough. But a bigger question is whether persuading Tallis that the physicists are right, that time is a dimension of spacetime like breadth or height, would require him to change his larger thesis. It’s not obvious that it would.

Of Time and Lamentation, overall, wants to do two things: to wrest

thinking about time from “the jaws” of physics and math, and to think through what time means for human existence in terms of the unavoidable approach of death and the inevitable decline of memory and our sense of living in the moment. Tallis believes that wresting time from physics will make us think in a wiser, more fully embodied way about these questions. But even if he’s wrong about the physics, it wouldn’t really affect his understanding of human experience. Maybe time is one dimension in spacetime, maybe it’s not. Either way, the world is going to *look* the same to us. We all still have to age and fret about the future and forget about things from the past, and so on.

It’s for this reason that Tallis’s critique of Kant seems so misjudged, especially when the views of time they offer are compatible in so many ways. Tallis summarizes Kant’s argument:

The thinking subject and the “material” object are inseparable; each exists only as the correlate of the other. There is therefore no mind-independent reality-in-itself to which we can gain access; there is no world outside of our thinking of it.

But Kant insists repeatedly that there *is* a world outside our perceptions. His point is that we can’t access it directly, and therefore can’t discuss it directly, because it only ever comes to us mediated by our consciousness. Tallis’s description of Kant continues:

None of us individually can construct the phenomenal world by means of our own consciousness. This universe of stable material objects connected in a unified space and of events connected in a unified time is not the work of one individual.

Indeed not, though Kant never said this was the case. Kant insists that there *is* a universe, which he calls the Thing-in-itself, and he accepts that we all individually perceive that universe. He argues that time is one of the structures of that perception, not that mind *constructs* reality. Mind *perceives* reality, using the premises of time and space. There is indeed something “out there,” and it provokes in us the sense that a temporal and spatial universe is unified and stable and so on.

Tallis’s other objection to Kant is that certain things happened in a certain order—the Big Bang necessarily happened before the creation of the solar system, for instance—even though there were no humans around to perceive them happening. But Kant doesn’t require humans to observe the Thing-in-itself for that Thing, whatever it really is, to do its Thing. The universe is really there. Kant’s point is that there is something about *it* that we perceive in the manner that Tallis explores—something in it that may or may not be enormity, durability, consistency, sequentiality and so on, but which we perceive as

such. So, whatever sequentiality may be in the Thing-in-itself, it comes to our minds via our perceptions as one-thing-after-another-ness.

A greater openness to Kant would not alter the main merit of Tallis's book: his project of righting the balance between subjective and objective time. The reason that time matters to us is that we are human. It is intimately a part of how we live and think and feel. Tallis is surely right to try to rebalance the scientific and philosophical accounts in that fashion.

The one thing missing from all three authors' accounts of time—from Farmer Tallis, Hunter Gleick, and Gatherer Burdick—is class. Whatever Machiavelli said about princes, aristocrats don't have to worry about time. They have the plebs to do that for them, to sort out all the time-dependent gubbins and arrange matters for their convenience. It's the rest of us who are ridden by time—who fret about sleeping through our alarm clocks, or missing our train to work, or not getting back in time to pick up our kids from school, or not completing our work assignment by the boss's deadline, or not having enough money to last until the end of the month.

Of course, time is a universal. The aristocrat grows old and dies just as does the peasant. And science, in the broadest sense, has always striven toward a neutrality designedly blind to such matters as class, race, and

gender. But these are not so easily brushed aside where our lived experience is concerned. Tick turns to tock at the same rate for the prince as for the pauper, yet the pauper dies sooner, after a lower quotient of lived satisfactions, and with less chance of being remembered afterwards. The pauper always has more reason to fear the future.

I have been proposing a distinction between hunter-gatherer time and farmer time. "Farmer time" does not refer to the sort of gentleman farmer whose wealth insulates him from the shocks of the unexpected. Rather, it refers to the way farming has been for most of the human race, for most of its history: peasants doing the hard labor for aristocratic landlords; subsistence farmers; hardscrabblers.

Similarly, the future exerts a radically different pressure on the single mother on benefits, wondering how she is going to feed her kids until her next Social Security check arrives, than it does on the man pondering whether it'll be the Cap d'Antibes or Bermuda this summer. For the latter, time may fly, or loiter, delightfully or otherwise; for the former it presses cruelly.

Let me put it this way: The fact that Frank Kermode's influential literary-critical study *The Sense of an Ending* (1966) is referenced in none of the three books seems to me a shame. All three are, in their different ways, about the sorts of stories we tell ourselves about time,

which is Kermode's topic too. One of the things he does rather brilliantly is to explore the difference between two Greek terms for time: *chronos* and *kairos*. *Chronos* means mundane time, ordinary time, time as one-thing-after-another, while *kairos* means the right time, the special or transcendent moment, the Wordsworthian spot-of-time or Joycean intensity. Being poor means living a life at the mercies of *chronos* and its exigencies. Being rich means having the leisure and opportunities to enjoy *kairos*. Carelessness with time is a hallmark of the very rich.

The future has always been with us in the same sense that the poor have always been with us. We're fascinated by time travel because we yearn, on some level, to escape time. But the time we yearn to escape is *chronos*, the peasant-farmer's time. The gleam of *kairos* shines here and there through the interstices of these three books, as it does in our lives. But it remains an intermittency.

Kairos's intermittency is a good thing for those of us interested in time travel, since *kairos* traps us in the moment of intensity, fixes us to the spot (of time). *Chronos* lays time out as a field, and invites us to work through it. The oldest extant work of literature dedicated to farming, from around 700 B.C., is by the Greek poet Hesiod, and goes under the rather time-travel-y name *Works and Days*. It is a verse compendium of farming wisdom and legend, a sort of agricultural almanac in which Hesiod takes his brother Perses through the year-long business of running a farm. To quote Hesiod: "in front of Excellence"—conceivably, even the excellence of fully comprehending time—"the immortal gods have set sweat."

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