Cover image: Alighiero Boetti, *Contatore* (Meter), 1967, collage on silkscreen mounted on wood, 16.7 x 27.6 in, edition of 123. © Alighiero Boetti by ARS/SIAE, 2011. Courtesy Fondazione Alighiero e Boetti, Rome.

The time right now is 2011 Feb 18 3:34 PM. The time stamped below reports 2012 Oct 29 9:58 AM . What's going on? For the moment, just disregard the impossible chronology that these two suggest. The two times (of writing and of stamping) could never be precisely alike. Each is a specific POINT, and no two are ever exactly the same.

Both originate from the same source though — a networked time server maintained by Apple Computer and named, simply, time.apple.com. This external beacon commands not only the official time here on my MacBook, but also synchronizes its local clock with those of Apple users worldwide (laptops, desktops, phones, pods, pads, who-knows-whats-nexts). It's easy enough to think of time.apple.com as a master clock, but actually it is itself only a network of time machines, a collection of counters comprised of a circuit of servers — computers named time1.apple.com, time2.apple. com, time3, time4, time5, time6 and time7. (The server my MacBook is using right now (time4) is located at 20400 Stevens Creek Blvd. in Cupertino, California, just a few blocks away from Apple's appropriate corporate address, 1 Infinite Loop.)

All of these servers communicate and agree what time it is at time.apple. com. But this covers only the United States, North and South America, and also must synchronize itself with time.asia.apple.com and time.europe. apple.com to provide a unified answer. All of this close coordination, communicated over distance and time, is governed by Network Time Protocol (NTP), a set of time-sharing conventions developed in advance of the World Wide Web in 1985, by University of Delaware professor Dr. David Mills. It is one of the oldest, and essential, Internet protocols.

NTP runs as a Ponzi-scheme. Each layer in the scheme organizes a set of time servers, who both receive the correct time from the layer above (each layer is properly called a "stratum" in the protocol) and also are responsible for dispersing the correct time to computers in the next layer down. At each level, more and more computers are connected.

The Protocol works by sending a message between two points on a network containing two bits of information: 1. what time it is now at the source, and 2. how long it took to transmit this message to its receiver. Simple addition tells you what time it is on the receiving computer

(according to the sender). So, what time is it, precisely? Multiply this transaction through the layer-cake of millions of computers redundantly organized around the Network Time Protocol, and you'll begin to see a collective consensus emerge that passes for accuracy.

Turns out that in order to send a MESSAGE between two POINTS, it's essential that the two points AGREE on what time it is, otherwise the communication is jumbled. A quick thought gymnastic confirms. You live in Los Angeles and I live in New York. Agreeing on EST, your clock tells you it is 2:34 PM, and mine tells me it is 2:32 PM, and you tell me, "Hey! in one minute the eclipse is going to start, you'd better run outside right now to see it (don't forget your sunglasses)!" and I drop what I'm doing to rush right outside. I see nothing. I'm bummed. I write back— "Nothing doing out there, I must've missed it." You reply, "But the eclipse is scheduled for 2:33 pm! You probably came in too early!" And I respond, "I'd already missed it then. It's 2:34 now." "No you haven't, it's in one minute still!" In the midst of this tedious exchange, surely the moon has passed in front of the sun and everyone in question has missed the party. (For communication, then, perhaps time is more of a medium than a measure.) What a misunderstanding!

These kinds of missteps multiply exponentially over a network, and it should be blindingly clear how critical agreement on the correct time is now, in our intimately connected present. Recently, I've been reading an interview with Michelangelo Pistoletto by Hans Ulrich Obrist. In it, Pistoletto describes his personal solution:

I think I may have already told you about my two-watch theory. As you can see, I feel the need to wear a watch on each wrist: the one on the right shows yesterday's time and the one on the left shows tomorrow's. We're in between. Time is something we somehow register as a concept of past and future. But in actuality, we find ourselves in a state that isn't quite as technical as we'd expect it to be. Maybe it would all be clearer if we were to tell ourselves that our lives are constantly shuttling between two times. After all, the present results from the balance between two juxtaposed instants. Let's push the image even further: you'll notice that the two watches that I'm wearing belong to different phases of socio-cultural reality. One of them is a gold watch: for ages, common belief

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had it that nothing was better than gold, thanks to the value lent to it by its stainlessness. The other one is a titanium watch. The value of things has changed, now that other stainless metals have been discovered. This watch is made of the same material used for interstellar voyages. There's another difference between these two watches as well, due to technological advances. Therefore there's more than just biological time — our life's time — but technological time as well.

Let's back out now and look only at the TIME STAMP that appears below. It currently reads 2012 Oct 29 9:58 AM . The stamp records the moment this document was last modified, saved, and exported as a PDF. In other words, the time stamp IS the publication date. This time was handed down through the cascade of networked time servers described before, but where did the original "time" come from and how was it set?

In the top tier of the Network Time Protocol, one computer is hooked directly to one extraordinarily accurate clock. Currently, this is the Cesium Fountain Atomic Clock running at the National Institutes of Standards and Technology laboratory in Boulder, Colorado, named NIST-F1. Atomic clocks rely on the fuzzed logics of quantum mechanics. As electrons orbit the nucleus of an atom, rather than winding down gradually in energy like a pendulum, they lose energy in discrete chunks, at which point the circling electron jumps down to the next closest orbit producing something like a very very very faint "click." These steps are consistent for any one atom, and this quantity is its RESONANT FREQUENCY. The resonant frequency of the cesium atom, for example, is 9,192,631,770 hertz (or cycles per second). And in a twist of recursive identity, the NIST has set the official standard for 1 second to be equal to 9,192,631,770 vibrations of the cesium atom. The United States' primary time and frequency standard is set then by NIST-F1 and is accurate to within one second every 60 million years.

So you can more or less assume that the time stamped below rather accurately reflects when this document was released. But, it includes a bit more specificity than the typical publication date as might appear in the running foot in a journal like this. Why?

We might all agree that 2012 Oct 29 9:58 AM   identifies one specific POINT in time, a forever unrepeatable instant that disappears as quickly as we can stamp it. 18th-century empirical philospher David Hume would most certainly concur. Working at the center of the Scottish Enlightenment, Hume described his particular, uncompromised version of empiricism. He asserted that everything we know or can know about the world arrives to us ONLY through direct sensory experience. Nothing exists outside of our own practical encounter with it as we move through the world. Further, he suggests that any sensible experience is composed of a single indivisible sensory building block which is marked by the limits of our perception. If you can't experience it, it does not exist. Hume most certainly was an essentialist.

While American empirical philosopher William James built many of his ideas on Hume's scaffolds, he also rejected Hume's reductive essentialism. In James's second-wave or "Radical" Empiricism, although knowledge about the world still arrived through direct experience, he dismissed what he called Hume's "atomism" or the idea that this experience was ever-assembled from smaller elementary blocks. James was, instead, a "Gestaltist"—a totalist who, although insisting on the incrementalism of building the world piece by piece, also understood that any one experience was whole and complete in and of itself, neither equivalent to nor reducible into any constituent bits.

So if we could query Hume on our time stamp, he would identify it as one irreducible moment of publication. However, ask William James and he says that this POINT is really more of a DURATION. Time is like that — both point AND duration. This is how it can bend and warp. A week, a second, a season: all are equal and discrete, but none are the same. The present can be any number of lengths, from a single vibration of a cesium atom to the life cycle of a publication.

Some nine months ago, I came across the image that now fronts this bulletin, *Contatore* by Italian artist Alighiero e (for "and") Boetti. In this collaged print—an edition of 123—Boetti catches a moment, pauses it, and extends the transition into one everlasting tick: an impossibly long now. The work is recounted by his long-time companion Annemarie Sauzeu Boetti, in her 2002 biography *Shaman-Showman*, like this:

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Among his early works, Meter (Contatore; 1967) signals the beginning of Alighiero's obsession with the passing of time, its rhythms, its markers. At first it was a game, which gave numerous occasions for jubilation. When the mileometer of the old Fiat 500, completely worn out, was about to reach the hundred or thousand mark, rolling from 799 to 800, or better still, from 99999 to 100000, he never missed the great event, and celebrated with a great, wild yell that would have embarassed any puritan travelling with him.

Then one day he depicted one of these transitions of seven digits. It is a multiple, a product of design, intentionally cool, in which the frisson of pleasure does not pass through the artist's hand, but rather through his mind. Alighiero would probably have celebrated the arrival of the year 2000 with his eyes fixed on the face of a quartz watch.

Let's return finally to the time at the end of the first sentence of the present text (2011 Feb 18 3:34 PM). And also, to the stamp below (2012 Oct 29 9:58 AM). We'll agree that the difference between these two points describes a length, but how can we measure it? Our meter-stick won't do. Time is nothing until it is counted, and for that we need a clock.

In *From Sundials to Atomic Clocks (Understanding Time and Frequency)*, James Jepsersen and Jane Fitz-Randolph describe keeping time as only a matter of counting the ticks of any regular, cyclical action. They also describe the constituent parts of a "clock" (or more properly a "clock system"—see the diagram at the top of the next page). First, you need a device that can produce a periodic phenomenon (for example, a pendulum). This is the RESONATOR. Next you'll have to sustain the periodic motion by feeding it POWER (for example, the wound coil of a mechanical wristwatch). Finally you need a means for counting, accumulating and displaying the ticks of the resonator. This is the DISPLAY (for example, a watch face and arms). Together, these three pieces define a clock. But of course to be useful, to measure a length, our clock must be RUNNING. With all of these conditions met, we arrive at an answer for the duration between writing the first sentence and publishing this final text: 619 days, 6 hours, 24 minutes. And this delivers one final paradox: Time can ONLY be measured by MOVING.

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POWER — RESONATOR — DISPLAY
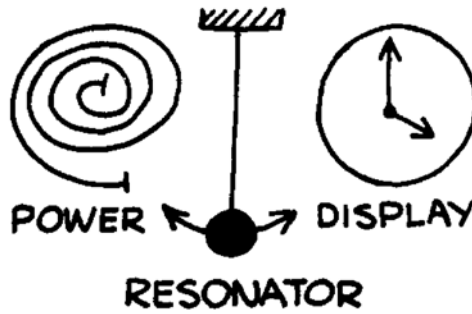
This "clock system" Jespersen and Randolph describe sounds a lot like the publishing ecology of *Bulletins of The Serving Library*. In place of the Resonator, we might substitute a regular six month PDF publication schedule, which is POWERED by writing, then eventually tallied, collected and DISPLAYED as rendered pages. Considering the design residue that falls out of 10 years and 20 issues of its predecessor, *Dot Dot Dot*, in light of this new mechanism and its attendant technologies, *Bulletins* is then REdesigned to be read primarily on a screen (from the tiny high-density display of a mobile phone to a giant LCD monitor) and secondarily on paper. As such, it is a highly specific aggregate—and quite literally a timely one.

A relatively recent essay by Régis Debray, published in *New Left Review* number 46 and titled "Socialism: A Life Cycle," offers a framework in which to consider this thinking. Compressing the history of the written word into 28 pages, Debray traces the hand-in-hand development of collective thought and communication media, from the LOGOSPHERE (the word) which runs from the invention of writing to the advent of the printing press circa 1448; through the GRAPHOSPHERE (the book) from Gutenberg & co., through the Enlightenment, to a proximate revolutionary 1968; and on to the current VIDEOSPHERE (the screen). Two pages before the end, Debray inserts the remarkably succinct table reproduced opposite, then winds to a halt with the following thoughts:

What further implications for social thought might we draw from the "three estates" of logosphere, graphosphere, videosphere—the word, the press, the screen? It would be possible to tabulate a series of norms and functions inherent in any social collectivity, and map out the particular modes and forms that have answered to them in each successive age.

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	Logosphere (Writing)	Graphosphere (Print)	Videosphere (Audiovisual)
Group ideal; political tendency	The One (City, Empire, Kingdom); absolutism	All (Nation, People, State); nationalism and totalitarianism	Each (population, society, world); individualism and anomie
Figure of time; vector	Circle (the Eternal, repetition); past-oriented	Line (history, Progress); future-oriented	Point (current events); self-oriented: cult of the present
Canonical generation	Elder	Adult	Youth
Spiritual class	Church (prophets, clerics)	Intelligentsia (professors, doctors)	Media (broadcasters, producers)
Legitimating reference	The divine (because it's sacred)	The ideal (because it's true)	The effective (because it works)
Driving force	Faith (fanaticism)	Law (dogmatism)	Opinion (relativism)
Status of the individual	Subject (to be commanded)	Citizen (to be persuaded)	Consumer (to be seduced)
Identifying myth	The saint	The hero	The celebrity
Maxim for personal authority	'God told me'	'I read it'	'I saw it on TV'
Basis of symbolic authority	The invisible	The legible	The visible
Subjective centre of gravity	The soul	The consciousness	The body

Thus, the symbolic authority for the logosphere is the invisible; for the graphosphere, the printed word; for the videosphere, the visible. Status of the individual: subject; citizen; consumer. Maxim for personal authority: "God told me;" "I read it;" "I saw it on TV."

Yet although these three regimes succeed each other in historical time, each asserting its own predominant forms and modes, it should go without saying that any one of us contains all the ages at once. Inside each of us there lies a calligraphic East, a printed Europe, a widescreen America; and the continents negotiate within us without losing their respective place. Each one of us is, simultaneously, God, Reason and Emotion; theocrat, ideocrat, videocrat; saint, hero and star. We dream of ourselves as standing outside time; we think about our century; we wonder what to do with our evening.