

RIVERHEAD BOOKS NEW YORK 2018

7 THE INADEQUACY OF GRAMMAR

*Gone is the whiteness
of snow—
green returns
in the grass of the fields,
in the canopies of trees,
and the airy grace of spring
is with us again.
Thus time revolves,
the passing hour that steals
the light
brings a message:
immortality, for us, is impossible.
Warm winds will be followed by cold. (IV, 7)*

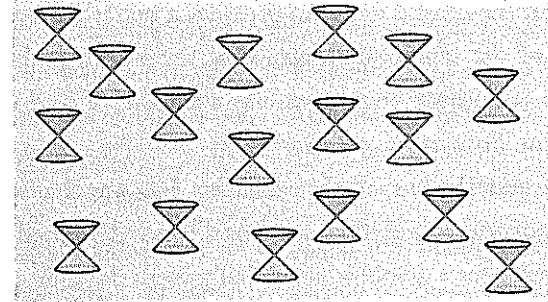
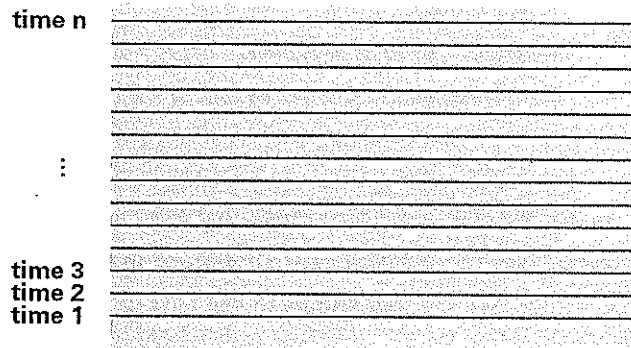
Usually, we call “real” the things that exist *now*, in the present. Not those which existed once, or may do so in the future. We say that things in the past or the future

“were” real or “will be” real, but we do not say they “are” real.

Philosophers call “presentism” the idea that only the present is real, that the past and the future are not—and that *reality* evolves from one present to another, successive one.

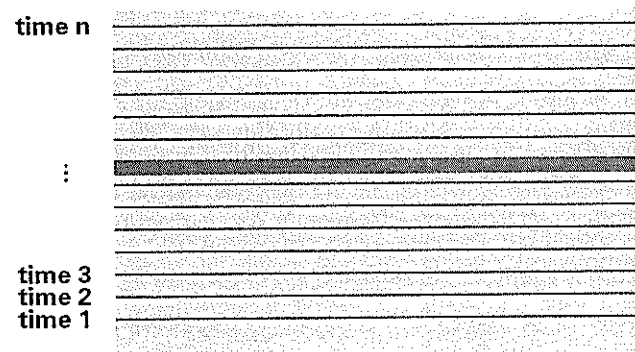
This way of thinking no longer works, however, if the “present” is not defined globally, if it is defined only in our vicinity, in an approximate way. If the present that is far away from here is not defined, what “is real” in the universe?

Diagrams such as the ones that we have seen in previous chapters depict *an entire evolution* of spacetime with a single image: they do not represent a single time but all times together:



They are like a sequence of photographs of a man running, or a book containing a story that develops over many years. They are a schematic representation of a possible *history* of the world, not of one of its single, instantaneous states.

The first diagram illustrates how we used to think of the temporal structure of the world *before* Einstein. The set of real events *now*, at a given time, is shown in gray:



But the second diagram provides a better representation of the temporal structure of the world, and in it there is nothing that resembles a present. There is no present. So what is real *now*?

Twentieth-century physics shows, in a way that seems unequivocal to me, that our world is not described well by presentism: an objective global present does not exist. The most we can speak of is a present relative to a moving observer. But then, what is real for me is different from that which is real for you, despite the fact that we would like to use the expression "real"—in an objective sense—as much as possible. Therefore, the world should not be thought of as a succession of presents.⁵⁹

What alternatives do we have?

Philosophers call "eternalism" the idea that flow and change are illusory: present, past, and future are all equally real and equally existent. Eternalism is the idea that the whole of spacetime, as outlined in the above diagrams, exists all together in its entirety without anything changing. Nothing really flows.⁶⁰

Those who defend this way of thinking about reality—eternalism—frequently cite Einstein, who in a famous letter writes:

People like us who believe in physics, know that the distinction between past, present and future is only a stubbornly persistent illusion.⁶¹

This idea has come to be called the "block universe": the idea that it is necessary to think of the history of the universe as a single block, all equally real, and that the passage from one moment of time to the next is illusory.

And so is this—eternalism, the block universe—the only way left for us to conceive of the world? Must we think of the world with past, present, and future like a single present, all existing in the same way? That nothing changes, and that everything is motionless? Is change only an illusion?

No, I really don't think so.

The fact that we cannot arrange the universe like a single orderly sequence of times does not mean that nothing changes. It means that changes are not arranged in a single orderly succession: the temporal structure of the world is more complex than a simple single linear succession of instants. This does not mean that it is non-existent or illusory.⁶²

The distinction between past, present, and future is not an illusion. It is the temporal structure of the world. But the temporal structure of the world is not that of presentism. The temporal relations between events are more complex than we previously thought, but they do not cease to exist on account of this. The relations of filiation do not establish a global order, but this does not make them illusory. If we are not all in single file, it does not follow that there are no relations between us. Change, what happens—this is not an illusion. What we have discovered is that it does not follow a global order.⁶³

Let's return to the question with which we began: What "is real"? What "exists"?

The answer is that this is a badly put question, signifying everything and nothing. Because the adjective "real" is ambiguous; it has a thousand meanings. The verb "to exist" has even more. To the question "Does a puppet whose nose grows when he lies exist?" it is possible to reply: "Of course he exists! It's Pinocchio!"; or: "No, it doesn't, he's only part of a fantasy dreamed up by Collodi."

Both answers are correct, because they are using different meanings of the verb "to exist."

There are so many different usages of the verb, differ-

ent ways in which we can say that a thing exists: a law, a stone, a nation, a war, a character in a play, the god (or gods) of a religion to which we do not belong, the God of the religion to which we do belong, a great love, a number. . . . Each one of these entities "exists" and "is real" in a sense different from all the others. We can ask ourselves in what sense something exists or not (Pinocchio exists as a literary character but not as far as any Italian register office is concerned), or if a thing exists in a determined way (does a rule exist preventing you from "castling" in chess, if you have already moved the castle?). To ask oneself in general "what exists" or "what is real" means only to ask how you would like to use a verb and an adjective.⁶⁴ It's a grammatical question, not a question about nature.

Nature, for its part, is what it is—and we discover it very gradually. If our grammar and our intuition do not readily adapt to what we discover, well, too bad: we must seek to adapt them.

The grammar of many modern languages conjugates verbs in the "present," "past," and "future" tense. It is not well-adapted for speaking about the real temporal structure of reality, which is more complex. Grammar developed from our limited experience, before we became

aware of its imprecision when it came to grasping the rich structure of the world.

What confuses us when we seek to make sense of the discovery that no objective universal present exists is only the fact that our grammar is organized around an absolute distinction—"past/present/future"—that is only partially apt, here in our immediate vicinity. The structure of reality is not the one that this grammar presupposes. We say that an event "is," or "has been," or "will be." We do not have a grammar adapted to say that an event "has been" in relation to me but "is" in relation to you.

We must not allow ourselves to be confused by an inadequate grammar. There is a text from the world of antiquity that refers to the spherical shape of the Earth in the following way:

For those standing below, things above are below, while things below are above . . . and this is the case around the entire earth.⁶⁵

On first reading, the phrase is a muddle, a contradiction in terms. How is it possible that "things above are below, while things below are above"? It makes no

sense. It is comparable to the sinister "Fair is foul and foul is fair" in *Macbeth*. But if we reread it bearing in mind the shape and the physics of the Earth, the phrase becomes clear: its author is saying that for those who live at the Antipodes (in Australia), the direction "upward" is the same as "downward" for those who are in Europe. He is saying, that is, that the direction "above" changes from one place to another on the Earth. He means that what is above *with respect to Sydney* is below *with respect to us*. The author of this text, written two thousand years ago, is struggling to adapt his language and his intuition to a new discovery: the fact that the Earth is a sphere, and that "up" and "down" have a meaning that *changes* between here and there. The terms do not have, as previously thought, a single and universal meaning.

We are in the same situation. We are struggling to adapt our language and our intuition to a new discovery: the fact that "past" and "future" do not have a universal meaning. Instead, they have a meaning that changes between here and there. That's all there is to it.

In the world, there is change, there is a temporal structure of relations between events that is anything but illusory. It is not a global happening. It is a local and

complex one that is not amenable to being described in terms of a single global order.

And what about Einstein's phrase "the distinction between past, present and future is only a stubbornly persistent illusion"? Does it not seem to say that he thought the opposite?

Even if this were the case, I am not sure that because Einstein has penned some phrase or other we should treat it as the utterance of an oracle. Einstein changed his mind many times on fundamental questions, and it is possible to find numerous erroneous phrases of his that contradict each other.⁶⁶ But in this instance, things are perhaps much simpler. Or more profound.

Einstein coins this phrase when his friend Michele Besso dies. Michele has been his dearest friend, the companion of his thinking and discussions since his days at the University of Zurich. The letter in which Einstein writes the phrase is not directed at physicists or philosophers. It is addressed to Michele's family, and in particular to his sister. The sentence that comes before it reads:

Now he [Michele] has departed from this strange world a little ahead of me. That means nothing. . . .

It is not a letter written to pontificate about the structure of the world, it's a letter written to console a grieving sister. A gentle letter, alluding to the spiritual bond between Michele and Albert. A letter in which Einstein also confronts his own suffering at the loss of his lifelong friend; and in which, evidently, he is thinking about his own approaching death. A deeply emotional letter, in which the illusoriness and the heartrending irrelevance to which he alludes do not refer to time as understood by physicists. They are prompted by the experience of life itself. Fragile, brief, full of illusions. It's a phrase that speaks of things that lie deeper than the *physical* nature of time.

Einstein died on April 18, 1955, one month and three days after the death of his friend.