



# What Is Life?

(Let's Take Living Things on  
Their Own Terms)

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**T**HERE IS ONE PROVINCE OF REALITY, one domain of the material world, where we humans have gained a knowledge unexcelled in its sophistication, its fine detail, and its almost infinite nuance of meaning. It is a domain that, perhaps more than any other, shapes our lives and influences our happiness day in and day out. And knowledge of events within this domain comes naturally: nearly all humans achieve a level of expertise dwarfing the scientific researcher's mastery of material phenomena in all other disciplines.

The phenomena I am referring to are those coming to expression in the human face. I have specifically in mind, not the power of producing those expressions, but rather of objectively reading them. For, of course, we do read them objectively. Our lives and society would be impossible if we could not navigate the universe of facial gestures with a largely shared understanding. *This means that.*

And the skill could hardly be more refined, even in the very young. Infants take an interest in and learn to read gestures—to the point of reacting differently to speakers of different languages. “Before they speak—before they even crawl—infants can distinguish between two languages they've never heard before just by looking at the face of a speaker.”<sup>1</sup>

In understanding the physical contours and movements of a face, we do not interpret isolated and discrete signs. The play of gestures upon a face is an integrated, multi-themed drama, and at any instant the barest detectable change—the slightest movement of the corner of a lip or brow, the hint of color in the cheek, a sparkle in the eyes—might signal a sudden dark turn in the overall narrative, or a gracious lightening of what would otherwise be a hurtful thrust.

Think of the different ways and different contexts in which a word may be said. Leaving aside the question of language itself, the minutest feature of the physical expres-

sion can convey whole worlds of meaning. And here, in such physical features, we are indeed dealing with *meaning*—a meaning borne upon a material dynamic of force and substance, but not explicable as if the meaning arose from, or were *caused by*, that dynamic.

Suppose, for example, that someone says to you, “Shame!” Depending on the physical modulation of sound, or the slightest shift of facial expression, or the altered gesture of the body as a whole—not to mention the larger context or the history of your relation to the speaker—the meaning could vary from that of severe and judgmental reproach through lighthearted or incidental banter all the way to the positive encouragement of an implicitly granted license.

We are talking, then, about a genuine and shared understanding of a realm of expression that is manifested physically, but explainable only upon a basis very different from anything found in textbooks of physical science. Of course, no one expects a textbook of physics to discuss such matters. But if, as many believe, it is all really “just physics,” we may reasonably wonder: why should the textbooks ignore it? Can we truly understand physics if we exclude an entire and highly distinctive domain of physical phenomena? Or, if it is not all just physics, might not this itself tell us something important about physics—about the character of a physical reality that so naturally lends itself to the intended meanings and expressive powers of living beings?

The usual thought, however, runs in a very different direction.

## Problematic Reductionism

Broach the question “What is life?” in scholarly or scientific conversation, and you will likely find yourself very soon embroiled in a lively debate. The issue will, in the end, almost certainly come down to one or another form of the question, “Can living things ultimately be understood solely

in terms of the fundamental principles governing the inanimate physical universe?”

It is a strange question, assuming as it does that we bring to the table a reasonable grasp of the fundamental principles governing the inanimate physical universe, while also suggesting that any investigation of the phenomena of life in their own animate terms might somehow be misleading, or less than fully grounded. But do we really know that much about the physical reality in which we are immersed? A moment's honest survey may convince us, rather, that we are encompassed by uncertainties.

Why, for example, is there something rather than nothing? What is matter, and what is energy? If, as physicists assure us, the ultimate particles from which the material universe is “built” are in fact not material things in any conventional sense, what do we actually mean by the words “matter,” or “physical,” or “substance”? Then again, the only world we know—or, it seems, could know—is discovered within consciousness; what does this imply about the nature of reality? And yet again: can we have a perceptible world at all except by virtue of sensible qualities—and if not, what would this say about a science that claims to be empirically rooted while foreswearing any serious attention to qualities?

To take up this last question for a moment: it seems clear that we have no material world without qualities of sense—warmth and cold; the colors of autumn leaves; the feelings of resistance, pressure, hardness, and texture; the sound of wind, water, and stone upon stone; the sensation of bodily pain. Subtract all qualities of sense experience from the world we theorize about, and there would be no world left. The only way we can have a material anything is by conceiving it in terms of the qualities of experience. Without such qualities, our scientific equations would have no meaning, because they would have nothing to be about.

If the qualities of experience are the irreducible starting point for all scientific understanding, and if, as everyone believes in practice, our understanding truly tells us something about the world, then you might think that a straightforward thought would suggest itself: perhaps it is the nature of the world to *appear in experience*—to exist, in its own essential character, as a *qualitatively appearing world*, a world coming to expression and fullest realization in *consciousness*.

This in turn might lead us to inquire more deeply into the nature of our own experience as knowers, rather than try to eject the knower from science as far as possible. It might even lead us to wonder whether the proper question is not “Can the explanation of living things ultimately be grounded solely in the principles of physical science?” but rather, “Can physical science finally be grounded only in the principles of life and consciously lived experience?”

The question will seem to border on insanity for those who have long accustomed themselves to the idea of a lifeless universe—for those, that is, who can so easily assume an unexplained eruption of diverse, reproducing, sense-making centers of life within an otherwise vast and senseless expanse of dead, supposedly qualityless (and therefore completely unknowable) things. But look at the matter from a different angle: does it not border on the scientifically irresponsible to lose sight of the fundamental uncertainties of our currently ungrounded physics? There are times when our taken-for-granted assumptions are exactly what we need to question if we want to find a fruitful way forward.

## The Pragmatic Glory of Science

If our physical science is ultimately ungrounded, it is by our own choice. We have wanted a science that *works*—a technological science. We have wanted to construct effective machines, and foremost among these are the scientific instruments that, under carefully specified circumstances, undergo predictable changes.

We may claim that the predictable working of such mechanical constructions validates the models in which our



Drawings (here and on p. 14) by Káthe Kollwitz.

knowledge is invested, and this is true enough. But what, exactly, is being validated? The models themselves are merely notional constructions whereby the world, or some portion of it, is re-imagined as a machine—or, at least, this is the researcher’s common aim. We certainly do gain by this means a useful knowledge, which is hardly surprising given that the entire effort has been honed for centuries toward this pragmatic end. Such is the standard—legitimate as far as it goes—by which we have chosen to judge the value of our scientific theories.

Nevertheless, it is one thing to articulate bodies of thought aimed at successful instrument construction, and quite another to apprehend phenomena in their own terms. This truth is forced upon us above all in biology, where disciplined familiarity with any particular sort of organism clearly leads to an objective understanding of that organism’s distinctive way of being—its recognizable *kind*—despite there being no machine-like determination of its behavior.<sup>2</sup> And we know very well from immediate experience that our ability to read the drama of facial gestures is an entirely different matter from, and is not dependent upon, a causal knowledge of the physical structures, physiological processes, or nerve impulses involved.

As for where we will be led when we begin to take seriously the qualitative character of inanimate physical phenomena, I don’t think we currently have much of a clue. A great deal will depend on our recognizing the one-sidedness of current analytical methods, where we never stop and ask ourselves, “What is this?” but instead analyze it into parts merely in order to ask, “How does this part act mechanistically upon that part so as to produce such-and-such a result?” Of course, we don’t stop with any of those parts either, but are driven by our method to analyze them into still smaller parts. It becomes an infinite regress.

Along this path we do learn about apparent mechanisms—relationships we can harness in devices of our own making. But we seem unable to cease our analysis long enough to say of any whole or part, “Behold *this*,” while actually meaning something by *this*. Every *this* is “explained,” not by considering what it is in its own right as a real and qualitative presence in the world, but only by analyzing it into other, equally blank and unconsidered *this*’s. We learn about the utility of things only against a background of deep mystery—mystery upon which we turn our backs in order to enjoy our new-found toys and the triumph of our manipulative powers.

When we do stop to contemplate the phenomena of the world around us, we will have a new kind of science—a qualitative science. It is not surprising that we can, from our current vantage point, say little about what such a science would look like, since the science we have had for several

hundred years was founded upon a conscious effort to leave qualities out of consideration. Presumably we have a lot of learning (and unlearning) to do. But it is hard not to suspect that our understanding of the organism as a living activity may offer us an open door that, if we are willing to step through it, will lead to vast and previously unsuspected physical vistas.

Physicists today continue to bump up against some of the same quandaries about the fundamental nature of things that perplexed the pioneers of quantum mechanics a hundred years ago. One wonders whether current methods have brought us to a dead end of understanding, despite impressive advances in practical knowledge. But this thought now occurs to me: during the mid-twentieth century, biology was tremendously stimulated by a migration of physicists into biology. Could it be that further progress in physics now awaits a return migration?

But if they are to bring anything fresh to physics, biologists will first have to reconcile themselves to the living qualities of their own subject matter. Then they will be well-equipped to inquire whether, in a way we have long refused to explore, we might learn to *read* a landscape—not, surely, as we would a face, but with something like the same attention to expressive gesture.

## What We Know Best

My suggestion, then, is that we should approach the study of life without obsessing about the question of its reducibility to the principles of physical science—this at a time when we have little idea about what sort of physical reality we would be reducing life *to*, and scarcely even know how to ask questions about that reality.

It seems indisputable that organisms are more directly and intimately accessible to us than physical phenomena in general. We are ourselves organisms, and beyond that, we are conscious organisms. It is fair to say that we *possess* our lives and animate bodies in a way we do not possess the non-living world. We have, within the small portion of the world’s real estate we call our own, an insider’s knowledge.

Living phenomena are, therefore, vividly open to our gaze. The obvious purposiveness of organisms, their striving for life, their drive to reproduce, their cooperation and struggle, their making sense of their world in relation to their own meanings—we can grasp these things far better than we can understand such basic “elements” of the material world as matter and energy, or even the simple fact that material objects *move*. At this point, we cannot honestly disavow even such an unexpected question of physics as, “Might such *moving* somehow be related, at a deep level, to whatever so evidently *strives* in organisms?”

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Or, we might ask: “When we command our own limbs by the “force” of our wills, do we experience something relevant to the inner nature of the forces of physics?” Of course, in today’s scientific conversation such questions are likely to be dismissed before they are seriously entertained. We already know the direction in which we want our explanations and effective techniques to run. Preferring to start with the world we know least (but can manipulate with greatest reliability), we then grow eager to reduce the “messy” life of organisms as far as possible toward the same sort of reliability.

Yet I venture to say that questions such as I have just now raised are reasonable ones, and the habit of dismissing them out of hand amounts to a refusal of the most obvious and profound mysteries bordering our science on all sides.

“Let there be questions” should be one of the most sacrosanct rules of science. We can only wonder how many worthy questions have disappeared from view by our

reluctance to take living phenomena seriously in their own terms. But the invitation remains open: nothing prevents our being receptive to what we know best. Nothing constrains us to look at the world only from the outside, as if we were unwelcome intruders in an alien landscape. We are free to embrace the gift—and the cognitive advantage—of our intimacy with nature at the very point where nature achieves, in us, its fullest expressive potentials. Surely it is here that the world we seek to know can reveal its most profound truths, if only—which seems so hard for many!—we can accept the natural dignity of our own lives.

### *Notes*

1. Fields, Helen (2011). “An Infant’s Refined Tongue,” *Science NOW* (Feb. 18). <http://sciencemag.org/news/2011/02/infants-refined-tongue>.
2. See my article, “Biology’s Shameful Refusal to Abandon the Machine-Organism,” at [http://RediscoveringLife.org/ar/2014/machines\\_18.htm](http://RediscoveringLife.org/ar/2014/machines_18.htm)