Ideas about Substance

Hammond, Albert L.

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When a child builds a house of blocks he knows the house is built of blocks, that even if it does not fall down he can knock it down and perhaps build it up again. It is often said that we can make an omelet of eggs but we cannot get the eggs out of the omelet. We know that one surface of one of those blocks we built with is a part of that block, but we cannot take the geometrical surface from the block: we can abstract it but not extricate it. We talk of a man's passions and his reason. We cannot extricate them or even get at them in the way we can the surface of a block. There are many kinds of parts and wholes. Some can be put together, taken apart, put together again. Some can be analyzed, clearly distinguished, but not separated. Some can be analyzed only with the addition of suspectable scaffolding to help the distinctions, or only with the loss of something that is in the whole but not in the analytic outcomes.

When we change a red slide for a green slide in the projector, there is change of quality, of color, on the screen. The colors of the sunset change by merging. A man walking across the room in a movie changes positions in rapid enough succession so as to give the cinematographic illusion of moving. All change of place can, by intellectual ingenuity, be so reduced, and, if Bergson objects and we ought not to forget Zeno, the calculus can be counted on to take care of the mathematics of it. The biologist sets growth as a character of life. Growth can be considered as a succession of larger sizes, although it may be questioned if this is adequate to what growth means to the child, or the parent. Living itself
seems to involve change. So does knowing—I do not say “having knowledge.” A large number, most, of the words with which we refer to the world and especially to action and undergoing, our own or another’s, carry in their meaning a change that is more and other than a succession (accepting that as possible without “real” change) of states. Living, knowing, hungering, fearing, loving, wearying, wondering—what are their cross-sections, whereof they may be built, or even whereby they may be understood? This too may be called illusion.

How do we know such goings-on? I do not clearly know what “having knowledge” means, either as to the “having” or the “knowledge,” but I think I know, and that I know that I know in knowing—say a headache. “Nur wer die Sehnsucht kennt”—he knows longing in longing and, in that, he comes to know something beyond. But he has no visual, auditory, tactile, olfactory, or gustatory “data” of longing; and any internal state is a state of change if not just poetic or mythical. What Berkeley said of cause, and Hume repeated with embroidery, is true of many notions: they are not observed. How do we know when we are hungry? Schopenhauer says one learns more of gravity by standing among the buttresses or under the nave of a cathedral and sympathizing with the aspiration and labor of the stones than by reading Newton. I think it would be inhuman to give up either one. The ordinary fellow, rather than yearning in cathedrals, may find it sufficient to carry his suitcase upstairs and find it easier to sympathize with himself.

When I was a graduate student in philosophy I went to a learned meeting and afterward reported, “Everything was intelligible to everyone and nothing was understood by anyone.” That pleased me, stayed, and led on. The verdict used a distinction between intelligible and understandable; the distinction made it intelligible that understanding might
be—and seemed to make me understand that understand-
ing should be—something more than putting under the
syntactic validity of intelligibility a set of clear and distinct
perceptions, something more than supplying data for the
argument and an argument for the data. But there was not,
and still is not, an understanding of just what that more is.

I had already given up the perceptual dualism of my
teacher Arthur Lovejoy. He had elaborately and acutely
made it as intelligible to me as any theory of perception; but
I became aware that I just could not honestly say I believed,
when I looked at him, or heard the wind, or felt the handle-
bar of my bicycle or the push of its pedals uphill, that I was
seeing or hearing or feeling or having an idea. So I knew I
was a realist, and I have become more so. I rejoiced that
there was a push of realism in American philosophy—Morris
Cohen and W. P. Montague came to Hopkins as visiting
professors, and they were realists—but it receded, and my
support of a trend became a complaint that since Hume
a great need of philosophy has been more realism.

Meanwhile I was developing my feeling that our
knowing needs a larger basis of acquaintance than is allowed
by the orthodox philosophy and psychology coming down
from the eighteenth century. Especially in years of teaching
“logic and scientific method,” my very admiration of the
cleanness of objective observation and measurement made
me wonder if success within this area does not foreshorten
acceptance of what may be beyond, and limit scrutiny of the
sources of some of scientific method itself. Surely induction
has some more penetrating assurance than that of the enu-
meration or criticism of repeated separate items of presenta-
tion. How do we know cause, how do we know a memory is
memory, how do we know each other, how do we know we
are hungry, how do we know we are alive, how do we know
the knowledge of good and evil?
Then at times there was a bit of worry that my two allegiances were contrary. My realism accented the objective; these how-do-we-know queries seemed to invite the subjective. My realism had become aware of itself in the midst of the eighteenth-century problem of perception—the perception of objects (which I believed to be things) with qualities and relations in space and time. But these other acquaintances, of cause, of hunger, of good and evil, are some mind’s acquaintances, and are a mind’s acquaintances with something that is not a thing and is not that mind itself, even if what the mind is acquainted with is its own contrivance.

The two recognitions of insufficiency have, it is true, worked against each other at times in the history of philosophy. When American realism receded, it may have been in part because of Whiteheadian and other calls for a wider and richer acquaintance.

But I have come to think the two are ultimate allies; that they find a common ground in the doctrine of substance—what is really there—as an integral existence which endures and changes and as such responds, acts and suffers, chooses.

If we are called on to interpret the question, “what is really there?” we can hope the word “really” escapes some of the well-known badness of “real”—much of the pretentiousness if not the equivocality—and the word “there” seems to limit us, helpfully, to the world of existence, fencing off the hopes and fears, the values beyond those hopes and fears, which are a real, perhaps the “most real,” factor in our acquaintance and living, and also fencing off the assertion of a Platonist or mathematician that the forms, ideas, numbers, characters, “eternal objects,” are the most real of reals. Fears do much, but without the fearer are nothing. The number may be eternal, but in that case cannot move or be moved. What is really there can, at least in varying degree, do with-
out what is here; but can also do to and be done to by what is here. This is not to assume anything as to the nature of “physical space” and not to forget that it may be denied that there is anything really there.

The word “substance,” I believe, was first meant to do the same job as the phrase “what is really there”; and through most of its mostly ancient and honorable usage continued to be so meant—with dangerous waverings. But it is a learned word and lately of ill repute. We must presently give it some stipulations and look at the history of both the word and the problem.

The problem of what is really there is raised by the official first philosophers, the Milesians, and stays on. There is no need to call it the only problem of philosophy or the basic one, except “ontologically,” as part of metaphysics, “beyond physics.” Value, as said, must be first in the sense of importance; and knowledge, as the “critical philosophy” argued, must be first in the sense of clarification. It may be that each has to depend upon the others. We philosophers, and nonphilosophers if any, have, do, are all three: we exist, and existing we know and choose. Putting it this way is to suggest that I feel Aristotle was right in making the category of substance fundamental.

We want to know about the history of the word “substance” and about the answers that have been given and the answer we should give to the question traditionally associated with “substance”: what is really there?

There is now a fairly distinct threefold division of verbal usage and of opinion among the scientists, the philosophers, and the general users of language.

1. With scientists and the popular writing that follows science and the ordinary talk on scientific subjects, the source and the most frequent use of “substance” is from chemistry: “chemical substances” are sub-superficial stuffs or materials
such as chlorophyl, haemin, proteins, magma. We can be comfortable in this usage in part because these substances are not meant as the substance since they are all clearly compositions or concretes. They are taken as substances in respect of the individual thing, plant, or animal in which they are; still more normally as substances in respect of the more familiar and more familiarly handled material in which they are. In this strain we are not apt to call wood or alpha particles substances.

As to a fundamental stuff in the tradition of physical philosophy or physics, either the scientists did not want to be bothered in the recent yesterday or they expressly did not want any such final stuff of things. Then the Einsteinians, still without much use of the word “substance,” were apt to be Pythagorean and formalize what is really there into space-time, geometry, and number, and so dilute the existentiality of their substance, the substantial becoming adjectival. The Copenhagen interpretation of quantum physics pushed its basic stuff to the position I used to find (and Werner Heisenberg finds) in the Milesians of sixth century B.C. Greece. In each case, however, and still more in both, there is apparent a revival of a real substantialism of the stuff variety, a quite new theory of basic material of a freer and richer potentiality than earlier materialisms. This is achieved by the optionalism of non-Euclidean geometries in relativity theory, and by the wave-particle-probability optionalism of quantum theory. Meanwhile the word “substance” goes on generally in this sort of discourse—even in Heisenberg’s usage—meaning “chemical substances.”

2. Among the philosophers perhaps the most significant from this point of view is Whitehead, who rejects “substance” because he accepts a definition of it as unchanging and he wants process. Being an experience man, although declaring himself a realist, he seems to more realistic realists
to dilute what is there (like and unlike the Einsteinians) when he makes “occasions” of experienced content or occasions of experiencing (either seems able to be or to get along without the other), the subjectivity and the brevity of the occasions being hard to make into any enduringness through change, and harder to make into interaction among themselves, except for those in one train or “society” which may be thought of as carrying predecessors on or being represented in successors.

The positivists and more orthodox followers of the tradition of Hume reduce both matter and person or thing either to phenomenalism (certain orderings among impressions) or to formalism and logicism.

The existentialists have the word “existence” and emphasize freedom and choice and doing-and-suffering—good marks of a sort of substantialism—but are even more subjective (except maybe Heidegger) than Whitehead and so lose enduringness, independence, and much of the thereness of old-fashioned substance.

The personalists sometimes remind us of the original assertion of Aristotle that substance in the truest sense is a thing like this man or this horse. So now and then do some of the English ordinary language philosophers. But in England Hume still scares, and the American personalists lack a full base of rebellion—which the existentialists have—or a base inside the establishment. And these too are wary of the word.

3. In literature and common sense the old meanings of the word, multiple but centered, and approbative, remain. So the Whiteheadian who has been lecturing on the needlessness of substance will go home and praise the substance of the editorial in the evening paper.

In the long and curious history of language some words stay around, and some even stay with the same meaning.
But many words go, and almost all words change meanings. Some words are more important for one person or another, say a philosopher. And a shift in meaning may not only be an annoyance to an old-fashioned fellow or a historian but also may significantly influence theory, belief, and action. It will usually have this doctrinal effect, illicit because hidden, by keeping some relic of its earlier meaning while definitely changing its reference—so that the thing to which it newly refers is given some share of its original meaning. Thus "atom," originally meaning the indivisible particle, if any, came in early modern science to refer to the particle chemically constitutive of the elements. When in time we split the "atom," there seemed to be a sort of logical as well as technological breakthrough or affront.

It is still a vanity to fight about words, or the fate of words. But sometimes, as in the case of "much study," it is a needful "vanity and vexation of spirit" to fight against bad usage or to put on record a warning of the old and the new meaning and reference.

"Substance" may not be the most important instance of such a word; but it may be. Philosophers may be said always, perhaps necessarily, to want to know what is really there. Such is the original meaning of "substance," and it is still visibly in the background of the twenty-three uses listed in the New English Dictionary. But even in Aristotle its reference—that in what-was-there for Aristotle which he thought most truly deserved the good word "substance"—wavered; and out of this wavering, perhaps, came divagations and embroideries, and, in philosophic and scientific theory, some fixations even partly contradictory. In the same age as "atom," with a sudden and wider jump, substance became identified with the stuff, especially the chemical stuff, of which a thing is made. Or with the philosophers, much affected by chemical substances as well as by Descartes'
“material substance,” the word has come to mean what does not change, although Aristotle’s basic characterization of it is as what can and does change. This alters the meaning, and after a while the alteration in meaning becomes a denial that there is any reference of the word to anything in existence since there is nothing there that does not change. Yet the deniers of substance still want to be able to distinguish what is really there from what somehow is unreal or less real and from what somehow is not there.

“Substance” has been since the Greek ὄντα, and still is generally, a “good” word: “a man of substance,” “the sum and substance,” “substantially so,” “a substantial meal,” “of more substance,” “give of your substance,” “wasted his substance in riotous living.” Students are apt to be a bit incredulous when I say that in recent technical philosophy, some philosophers, perhaps most, find it a “bad” word, and that others not directly involved, whom they influence, are fashionably apt to deride substance or are chary of paying any deference.

And yet in all its many general-use meanings it has kept the core of reality, of the relatively more real, and the natural as the existent: hence the independent, the enduring, the more than subjective, the nonartificial, the effective, the affected, the important, what is there. These are “good” notions; the philosopher can hardly upstage them.

In time most words generalize, lose their edges, widen out and flatten down. So “category”—which for 2,200 years kept its learnedness and its Aristotelian high-and-mightiness even while shifting variously its technical application—was suddenly in this century made the prey of psychologist, salesman, advertiser, quiz show, and newsman, and now the poor thing is just an overworked word for any sort of sort. I have read of a “category of tugboats in the Baltimore harbor.” “Firm” meant an association of individuals who remain in-
individuals but work together and have a sort of group existence, as a firm of lawyers or architects. Now it is the newspaper word for any business, company or corporation. I have read of someone buying ("purchasing") a firm, despite the outlawing of slavery.

Other words come to apply, within their meaning, to more specific or individual things or notions which may turn out later not to deserve that meaning or to which later theorists may not want to grant that meaning. So with "atom," and "ether," and the "Donation of Constantine," and that "great fish," the whale.

"Substance" (what is real and existent) came in Descartes and his successors to specify and, I think, falsify its meaning so that its trait of enduringness withdrew into unchangingness (Descartes was a mathematician and mathematical physicist), and its comparative or relative independence pushed on to absolute independence. So then in chemistry the word is applied to the stuff or stuffs of which things are made. Twentieth-century science uses the word easily in the plural (chemical "substances") but mostly has no absolute stuff and needs none. Nor do most philosophers think there is any unchanging material substrate; and, denying this, they are apt to say they are denying substance. For my part, I do not believe there is any unchanging material substrate. And if there were, I should not call it substance. Yet substance I am sure there is, and indeed must be.

Meanwhile, after the meaning of "substance" and the theory of matter had narrowed to meet in something probably altogether insubstantial, the major ingenuity of modern philosophy developed. By this it is decided that the existence of mind and the existence of matter, now purified and separated, are, indeed can only be, found in and constructed out of the presented ideas, perceptions, impressions, phenomena (perhaps Thomas Hobbes's first word, "phantasms,"
is the best), experience (in the more recent fashion). So matter and mind, body and soul, I and it, are themselves ideas; not ideas for any mind, since it would seem a mind for which an idea is an idea is itself something more than an idea; and not an idea of any thing, except other ideas or ideal constructs of ideas.

Even here there will be some theory of what is more and what is less really there. The phenomenalist normally wants a distinction between dream and waking. In the sort of world Socrates and Theaetetus attribute to Protagoras, some opinion is better than another even if not more true. Even that “strange guest” of Nietzsche’s, nihilism, rejects some commands as peculiarly mythical. Nevertheless, in such a world as has been fashionable since Hume (although it may not have been “really” his world), and with the acceptance of “substance” as meaning the unchanging, what is asserted to be really there is not going to be that sort of substance and, surely, in older and better meanings of “substance” it is going to be pretty insubstantial.

A trouble is that change, too, is going to be hard to account for. Santayana would say we are here given a tapestry of changeless “essences.” Change might be said to be a “cinematographic illusion,” the flicker of the many stills of the movie. But it is hard to account for illusion when there is no mind with an enduring acquaintance with change to be illuded. So Bergson, and Whitehead, and others with a feeling for substance, struggle.

It is hardly fair to blame the not unnatural translation of substance as stuff on Descartes—who has earned his title as father of modern philosophy by being always handy to blame for whatever it is we dislike in modern philosophy—since it is clearly played with (if usually rejected) by Aristotle, the definer and answerer of the problem of substance, and is present, as it were inversely, in the first philosophers
and physicists, the Milesians. Inversely because here the
meanings cannot be said to be confused: they are just begin­
ning to be separated out. We are not told what the Milesians
were up to; not told by them. Our modern books tell us their
aim was scientific—to give a natural explanation of the
natural world (whatever “natural” means)—and philosophic
—to discern the real, as that of which explanation is intended.
Each of these two aims, scientific and philosophic, may use,
bow to, reject, or be critical of the other. The two begin
to show themselves, and the former—the motive of explana­
tion—tends, as intellectually the more clearly needed, to take
dom’inance in the second of the Milesians, Anaximander. But
my feeling and belief is that the first, Thales, was not so
much setting off on the “problem of the constitution of
matter” because he thought it basic in scientific explanation
as he was announcing a vision of the real nature of nature.

When Thales said “All things are water” he meant that
all things are “made of” water in the sense that we are
made of eyes, and muscles, and blood; and also that the
table is made of wood; but not in the sense that either is
made of atoms or electrical energy. Water is not recondite
but immediate. Water more than any other part of the ac­
tual has the important character of things, not only has body
but has power and a sort of primitive life. “All things are full
of gods.” Doubtless Thales was impressed by the fact that
water can be seen turning into ice and steam; and he would
take water from among these three because, certainly on the
Ionian coast, water is the normal form. But Aristotle tells
us, I am sure truthfully, that Thales was moved by the fact
that water moves, that moist warmth is characteristic of life,
that all seeds are moist.

Thales was great not only by the firstness of his genius
but by its priorness: he came before analysis had prepared
the artificial parting of the ways in which he could go wrong.
I used to say that one has to start the study of substance with Thales although he was looking not for substance but for the stuff of all things. Of these three propositions—it is good to begin with Thales; he was not looking for substance; he was looking for stuff—the first is true but the second is partly true only in the way that the third is partly false. The meanings of substance and stuff had not been analytically arrived at, to be separated or equated. Thales, like any philosopher, was looking for what is real. The Milesian bent of mind inclined toward what became the stuff identification of substance. But this was not express; and I think it would have been refused, by Thales and perhaps by Anaximander and Anaximenes, if it had been made express that stuff was to be divested—as in the later materialistic tradition, or just as firmly in the later tradition of the meaning of matter for the anti-materialists—of as much as possible of the non-stuff predicates, notably character and quality, power and life.

When I was a boy in West Baltimore, the Park Board built a fountain in Harlem Park. It was a deep, heavily walled, circular pool, some twenty-five feet across, with heavy marble balustrade, and heavily overarched with big trees. It had a single wide nozzle in the center, and just before the spray fixture was brought uptown for attachment (so the story was) the water was turned on. As the pool filled, the water reached the level of the nozzle, covered it six inches, and established a rhythm: the stream, forcing its way through, urged the water up the sides of the pool and then the mass of the water coming down again piled up in the center and cut off the heavy stream. It was an Old Faithful of steady period, thirty or forty seconds. It was named the Geyser in the neighborhood and soon so known across the city.

The nozzle was big, the stream heavy; and, as it was cut off below, the water already in air hung suspended a mo-
ment and fell back with a heavy plop rather than a splash. The spray was not at the fountain but around the pool, the leeward side of which was always wet. The children, the adult passers-by, even the officials were amused and bemused. And the intended attachment was sent back downtown.

When now I read or talk about Thales, I think of the Geyser. It brought me up on, it made me feel, the potent reality of water—as Walt Whitman on Paumanok shore felt the wave “out of the cradle endlessly rocking.”

I did not always think of the Geyser with Thales. It took me time to get the feel of Milesianism, its reaching for substance as well as for stuff. The books say that Thales, the great naturalist and generalizer, wanted a simple material of which all things are made. I do not doubt it. But if we turn back from our late-won lust and confidence in building up to living things from an abstractly pure geometrical or algebraic matter, perhaps we can with Thales, looking at water—and the magnet—say the reality of the world is in living things, “generated not made,” and, “All things are full of gods”—the heaviness of body, the life of its lift, its force, its direction, its aspiration, its fall and weariness.

I think Thales is splendid: first philosopher of what is, first not only in time but in rank of rightness. He announces the thereness of a common nature but keeps it actual by keeping it alive. But his splendid rightness is the rightness of the road before the fork is reached. He grasps the fact and the problem before the problem is opened up. Anaximander is the genius who takes the decisive step and by its very “justice,” the justice he appeals to, misleads most of those who came later. For he could hardly see, without quadruple genius, and they generally failed to see, that his just and justified step took him away from substance into the analysis of substance along that dimension that we mean by stuff. Anaximander saw that if we mean by Thales’
question to ask what is the ultimate stuff, material, component of things, in the simple sense in which a table is made of wood, then we cannot nominate any actual familiar stuff in the world, for if we do, another stuff can say, "Why not me? You are unjust. You say water turns into steam; does not steam turn into water?" That of which all things are made must be no present thing, must go beyond, beneath all visible candidates, and ultimately beyond all namable or thinkable characters' existence or potentiality, must be the "boundless," the uncharacterized from which all characters are "shaken out," although no character or characters are previously there. But Anaximander knew there are characters, is character, in this world although there is none in his boundless. He is regularly praised for the firstness and the elaboration of his "naturalistic cosmology." Good Milesian as he is, he thinks of the stuff as real and lets the first shaking out of character, form, individuality, differentiation go unexpounded. So later the probable descendant of his boundless, Aristotle's prime matter, "yearns for form as the female for the male," although as such it has not even the first qualities of hot, cold, wet, dry. Without warmth or frigidity it yearns. I think it is Anaximander who gives the "Copenhagen interpretation"; he is the Niels Bohr of the first physics. Pythagoras does it from the other direction. "All things are number." All things are not merely the bounded, all things are the bounds. If we ask a physicist what is the constitution of matter and he says energy or electricity, we get a Milesian (but a "sophisticatedly" Milesian) answer; and if he is a follower of Bohr and Heisenberg, we get it in Anaximanderian terms. If he talks of atomic numbers and differential equations, we get a Pythagorean answer. Yet, although there is no doubt of Pythagoras' honesty, he cannot have completely meant his "All things are numbers." In addition to the numbers, there seems to be "an outside dark-
ness” and the soul. The Pythagoreans speak of an outside darkness that is drawn into the bright and shining numbers to make this world, the cosmos. Pythagoras’ personal and moral and religious teaching, the soul—the reality and overriding importance of the soul, which goes from one bodily life to another, which is the bearer of knowledge and ignorance; of virtue and vice, merit and blame; which grows better or worse, and which by these very facts is assuredly characterized and richly formed, a character in the human sense—is not a character in the logical sense, is not a predicate, an adjective, a shape, a form; is not a number. Numbers, poor splendid things, are eternal; the soul is immortal. Some later Pythagoreans tried to define the soul in numerical terms, and Socrates, a true Pythagorean, sufficiently disposes of the “soul as a harmony”: if the soul is a real soul, that is, a Pythagorean or Socratic soul.

(I am not prepared to say this is the same as Aristotle’s argument that the Aristotelian theory of the soul as the form of a living body makes nonsense of transmigration. Aristotle’s form here, or “first entelechy of a body naturally having life,” is expressly something more than a shape, an arrangement, a number—the theory he attributes to Democritus and rejects in the Parts of Animals [I, 1, 640b30 ff.].)

To be sure, Pythagoras is an extraordinarily many-sided philosopher. Born on the island of Samos, just offshore from Miletus, he carried the Ionian scientific habit of mind across the Greek world, going as a boy or youth with his father, Mnesarchus, to the southern coast of Italy, the instep of the boot, the cities of Sybaris, Metapontum, Croton, where the Orphic cults, probably the older Mediterranean religion, were known and growing. Thus he did not bring with him the secularism of Ionia and its scant belief or interest in the soul; but he combined his scientific vision with a vision of the worldly and otherworldly life of the soul and declared the
ultimate salvation of the latter in the perfection of the former. We free ourselves from barbarism and worldliness into competence in this world and others by understanding of what is, and the best understanding is mathematics. Bertrand Russell in the far-off days of “The Free Man’s Worship” was being Pythagorean, if not just so. The father of mathematics, Pythagoras is also the father of musicology; and he is the founder of perhaps the longest-lived of all secret societies; the propounder of rules dietetic, superstitious, and purely Pythagorean (those for which no other reason can be thought of, one of which I try always to keep); the theorist of the three lives (those who take care of the crowds at the Olympic Games, the competitors, the lookers-on) and so the father of Greek snootiness and of classicism in art and enjoyment; the background of Socratic ethics; the founder of the Italian school of medicine with the theory of the temperaments, tension, and tonics; the metaphysician of means and extremes, 6–8–9–12, the regular polyhedra, elementary (atomic) weights and numbers, the music of the spheres; the great teacher of otherworldliness in the world’s business, of intoxication (beer, wine, poetry, music, mathematics) in religion, and so of the Methodist revival, of the danger of routine and respectability. Among the paradoxes: as the background of Greek snootiness we may find him behind the striking Greek failure to do much with arithmetic; and as the background of Methodism we may find him behind the United States prohibition amendment.

Still, as ontologist he seems the complement of Anaximander. They see a radical analytic distinction of two ingredients—rather two ingredients—content and form, mass and shape, the boundless and number—and each proclaims the one he likes. Their teacher, Thales, had both. And so, I think, does substance.

I am a body, have Anaximanderian stuff, Aristotelian substrate. Last summer late in the surf at Ocean City, I was attacked by a surfboard just after its rider washed out. I had seen the board and I believed its materiality; but my body itself felt, hurt for a week. I can argue that such awareness of changing external shapes and of intracutaneous pain can be taken as sufficient evidence of being alive. But surely that basic assurance or experience (here a word I dislike and distrust seems to fit) of living, now briefly focused, is more than an argument, more even than that Cartesian “I think therefore I am,” which he protests is too immediate to be regarded as an argument. Hume’s trick of tabulating the “impressions” of sight, hearing, touch, taste, and smell, plus pain or pain-pleasure, and then arguing, with no possibility allowed of any other acquaintance, surely wore insufferably thin a hundred years ago, although it still afflicts us—and, it is only fair to add, sometimes protects us.

Heraclitus of Ephesus, Miletus’ neighboring city to the north, was the first rebel against science. He used to be hailed as notably scientific because he believed in change. And yet he came after Thales and his energetic and transmogrifying water, and those who hailed him lived in the nineteenth-century days of reversible Newtonian-Laplacean physics, when Darwin was restraining even biological change in regularity. Heraclitus’ indignation for his scientific predecessors was similarly, but less inaccurately, unfair to the life in Thales’ teaching and the soul in Pythagoras’. The laudable objectivity of the scientific motive in those great originators led them to objectify even the metaphysical vision behind the scientific and to allow the natural focusing of their own and their followers’ contemplative interest and curiosity on the more objective scientific theory. So Milesianism became a theory of the constitution of matter and Pythagoreanism, a theory of extremes—means and the regular polyhedra
as explanatory of heard music, observed physics, and calculated astronomy. Just “a knowledge of many things,” Heraclitus says.

Heraclitus is indignant because he thinks his scientist predecessors and contemporaries have tried to take from him the sensuous-sensual qualities in which he glories and still more because they took away the enduring self in which he feels real and part of the great self of all things. He is the philosopher of change because he knows his identity is not the identity of a number. He is the philosopher of the enduring because he knows he is not a difference or a bundle or succession of different numbers or descriptions or stuffs. “It is wise to harken . . . and know that all things are one.”

Mr. W. K. C. Guthrie remarks that Heraclitus is the first to cast suspicion on the trustworthiness of the senses. The remark is just, but seems to me very incomplete. Heraclitus is skeptic, relativist; and in all things pulls no punches. Of the senses directly he says, “Eyes and ears are bad witnesses.” They are bad witnesses but precious enjoysments. They are bad witnesses but still witnesses, and our only ones on the scene. They are bad because they are apt to focus attention on the separate qualities or on the inconstancy of quality and fail to see that even the inconstancy would lapse but for persistence, fail to get through to what is changing, fail to let us remind ourselves that they are avenues not only from the world but to ourselves. He is the philosopher of change surely enough because he emphasized that change is integral with the sameness of the enduring.

He is enough of a Greek and an intellectual at times to “think” that the best part of the self is the “thinking” part, the fire, which is also the fire of the world; and even at times to suggest a confusion of the “common,” which is the true object of thinking, with the thinking common fire of the world. And yet the doctrine of the “common” as the logical
and objective—as opposed to the subjective “world of his own” into which the sleeper “turns aside” and as opposed to the subjective-objective world of perceived things of which we all see different sides and angles—is itself, whatever its place in the Heraclitan personalism, one of his surest claims to originality and acuteness.

With the doctrine of the real and changing “one,” that all things change and there is no change except of things, Heraclitus is the first to announce the doctrine of substance as substances, as changing individuals. But he does not use the word. That remains for Aristotle: “Substance in the truest sense is something like this man or this horse.”

I do not think Heraclitus was the first to feel or believe this. With the assurance of most philosophers—feeling their views are “really” those of common sense—I believe we all start out that way. The child never doubts that he is one and enduring and changing. Then he goes to school and studies arithmetic and logic and chemistry and in college he is shocked to wonder whether he has “identity.”

Aristotle also was the first to give an analysis of change, which the philosopher of change had not bothered about. \( \text{μεταβολή} \), he says, may be change of place, change of quality, or change of substance, as either growth and decay or (possibly) coming into being and passing away. It may be significant that change of place, which is most important or sole for (Cartesian) physics (not Bacon, or Bergson), seems least important for substantialism, as external to the moving thing. And in any case, Aristotle’s analysis of change, still useful and used, has been apt, like all analyses, to externalize for the uses of observation and its scientific story. Heraclitus would probably want more. He would at least wonder whether change of personal character (and sameness as well, since we should have a parallel analysis of sameness) is taken care of under change of quality as that has come to be under-
stood. There is that first-level change when the now-angry man becomes calm and that second-level change when the characteristically irascible man becomes serene. (It may be that the sometimes warm disagreement as to whether God changes could be eased. The Jew, who is most apt to accent “and still the same,” talks of change, even locomotion, in the Old Testament. What we all may want is the last rubric of dependability above. John Bowring’s hymn, “Chance and change are busy ever,/Man decays and ages move;/But His mercy waneth never,” offers our undependability dependability. But what does not “wane” allows a sort of comparison to the moon. And mercy, if any good to us, is active. What change is there in the stationary traveler when “the mariner, in his fixedness and loneliness, yearneth toward the journeying moon, which still journeyeth and still sojourn-eth”?

Parmenides breaks in from the West, from Elea the big Greek city farthest up the west coast of Italy—Parmenides, the most high and mighty dialectician of our philosophers, breaks in with the annoying voice of logic. “There is just one question. ‘Is it, or is it not?’ If all things are water, then anything that is not water is not. So be honest and do not talk of water turning into anything for, if it turns into, it turns into that which is not. Nor is there any nothing into which it can move and wherever it might move it is already there. ‘Nor was it ever nor will it be but it is, altogether.’ And it cannot have come into being nor can it pass away, for there is no nothing from which it could have come or into which it could go, and ‘what cause could have made it arise later rather than sooner?’ ‘So is becoming extinguished and change of bright color.’ And ‘it is all one to me where I begin for I shall come back there again.’ And this is not merely for water. Indeed water already implies internal characters and external contraries and all this is impossible.
What we have to consider is quite simply what is. What is is; there is no is not. ‘What can be thought and that for the sake of which thought is are the same.’”

He is obviously wrong. But he seems to say that he does not care about what is obvious as long as he sees what is necessary. What he does not tell us (only the first and most radical of a long and perhaps endless line in history of failures to fill in) is how appearance, error, illusion is possible in the world that Parmenides announces as necessary.

He is not wrong, it seems to me, in the thesis that any stuff or material or basic-component theory of the world must have more than one component. And history since Parmenides, with occasional forays into the country he forbids, has backed him up. And this has worked out at times unfavorably to the word “substance.” As with the Milesians, there is a natural tendency in the search for what is really there to poke into what things are made of. And then we talk at once of “a” basic stuff and “the” basic stuff. This may be only or mostly the proper love of simplicity in explanation; but there seems a special tendency to one in explanation by stuff. So we could rest easy a generation ago when we could feel that the electron was somehow the component of the proton; and so soon after Parmenides, when empty space moved openly on stage, it seemed, and still seems, not quite on a level with the matter moving through it. Is space material or not? And so some, probably without realizing it themselves, feel that if they say substance, they must say stuff; if they say stuff, they must say fundamental stuff; if they say that, they must say there is just one; and saying that, they see Parmenides wagging his finger.

By temperament Parmenides is an abstractionist. He is doing more than telling stuff-theorists to have more than one sort of stuff. His argument is that we must go on to, and must stop with, what is; and that which is, is, and is necessar-
ily one as what is. I think this argument is invalid. But its invalidity is not easily and validly exposed. It is a commonplace to say that Plato dealt with it in the Sophist—with the doctrine of the existential and the predicative uses of the verb “to be” and of the “participation” of Ideas. He did—brilliantly, profoundly, difficultly, and incompletely. The topic also calls in the full theory of classification—classification which Aristotle practiced superbly but curiously did little to expound. We note here only that the generalizing process—from the individual “across the line” into the realm of classes, up from the lowest species through successive genera to the neighborhood of the category and then to the category, and beyond to the sumnum genus that is not a genus—all involves leaps and losses. Even being is not a competent sumnum genus since it does not take nonbeing into account; even the already-actual-ness of being cannot be used as a stuff from which the world can be thought of as made; it can only be abstracted from a world of individuals and particulars we find to start our knowing with. This is true of knowing; it is as true of creation; or so it seems to me. I know that great oaks from little acorns grow, and we may all have evolved from a primeval “soup” (with space and motion)—but not from being.

The atomism of Leucippus and Democritus, masterpiece of simplicity and elegance and in the mainstream of Western physics until now, takes the “One” of Parmenides and makes the least possible change and the most radical possible change. Accept the being of what-is-not in the fact of empty space and break up the fissureless “One” into very many, very little, pieces in motion. Within the atom keep Eleatic purity: no motion, no quality, no possible crevice. But externally the atom is in motion, without need of applied force, in motion haphazardly and with no up or down (forget the later moralist atomism of Epicurus and
the Roman Lucretius with its “like a snowstorm”). The atom has size, shape, position, motion—the mathematical characters—and since, as Eleatic, it cannot merge or alter on impact, it follows its hard nature and some few, very simple, laws of geometrical mechanics (cf. the early modern concern over the impact of two perfectly rigid bodies). Develop whirlpool motion and we soon have nebulae, solar systems, ups and downs, more and more elaborate and complex agglomerations and constructions of atoms. All, substantially, is still atoms and the void.

Now this beautiful theory is the perfecting of the mathematical form of Pythagoras, dropping off the substantial soul; and of the stuff of Anaximander, dropping off the “hylozoism” of Miletus. There is propriety in the tradition that Leucippus was a Milesian who came to Abdera, on the northern shore of the Aegean, and taught Democritus. Thus analysis, and acuteness of imagination, has proceeded to a perfected platform for mathematical physics as a basis for all science. Its very elegance within, however, poses the philosophic problem of how to get outside to any other: how to emerge, how to move from a pure geometry and abstract matter and motion and space to the life, the knowing, the qualities, the goods and bads of what we set out to explain and of what we are.

Atomism inherits this difficulty from its “father Parmenides.” Parmenides traveled to Athens with his follower Zeno and talked with the young Socrates, asked him about the newfangled “Idea,” how it could be both one and many. We want to ask Parmenides how within his “One” he can account for the seeming differences of Italy, seas, and Attica; for the seeming motion of his journey—not to mention how we seem to be moved by those never-existent motions. With the birth of motion after the marriage of the geometrical what-is of the atom and the geometrical what-is-not of
space, we get physics; but we still wonder: how does this beautifully bare ontology account for acquaintance, quality, response to quality and value? The history books call all these subjective, mental, a desirable naturalization of the “illusion,” which the books invoke to help Parmenides. But where among the atoms in the void can the subjective grow; how does one shape have awareness of another; and why should a shape, no matter how complicated, be for or against its own shape or change of shape or another shape? Disruption is pain and we shun it, says atomism. This is surely so for a living thing; but the void is void, the atom is eternal, the shape of a billion atoms is utterly outer to the atoms, is at most truly predicative not substantial. “Emergism” has emerged. But it seems just an adding in of the mystery by a little at a time.

To be sure the atom, the Democritean boundless, is in its simplicity quite precisely bounded. It keeps the mathematical nonqualitative qualities of extension, at least pseudo-existence, space-time occupancy, and exclusiveness. And so Werner Heisenberg says: “This implies his concept of the atom cannot explain geometry, extension in space, or existence, because it cannot reduce these to something more fundamental. The modern Copenhagen quantum view of the elementary particle with regard to this point seems more consistent and radical.”¹ Thus Francis Bacon often praises Democritus’ use of “dissection” as against the “abstraction” of Plato and Aristotle;² Bacon first praises Democritus for making Cupid (the atom) naked but not formless and then finds fault with the form Democritus gives him. Really, the Baconian objection is to the eternity and geometrical simplicity of the atom’s motion and of the atom’s shape.