

regularity that golden retrievers tend to be very gentle and friendly) can validly be attributed to *meanings of molecules*.

To people who deal directly in dogs and not in molecular biology, this kind of thing is taken for granted. Dog folks talk all the time about the temperamental and mental propensities of this or that breed, as if all this were somehow completely detached from the physics and chemistry of DNA (not to mention physical levels finer than that of DNA), and as if it resided purely at the abstract level of “character traits of dog breeds”. And the marvelous thing is that dog folks, no less than molecular biologists, can get along perfectly well thinking and talking this way. It actually works! Indeed, if they (or molecular biologists) tried to do it the pure-physics way or the pure-molecular-biology way, they would instantly get bogged down in the infinite detail of unimaginable numbers of interacting micro-entities constituting dogs and their genes (not to mention the rest of the universe).

The upshot of all this is that the most *real* way of talking about dogs or hogs involves, as Roger Sperry said, high-level entities pushing low-level entities around with impunity. Recall that the intangible, abstract quality of the primality of the integer 641 is what most truly topples hard, solid dominos located in the “prime stretch” of the chainium. This is nothing if not downward causality, and it leads us straight to the conclusion that the most efficient way to think about brains that have symbols — and for most purposes, the *truest* way — is to think that the microstuff inside them is pushed around by ideas and desires, rather than the reverse.



CHAPTER 13

The Elusive Apple of My “I”



The Patterns that Constitute Experience

BY OUR deepest nature, we humans float in a world of familiar and comfortable but quite impossible-to-define abstract patterns, such as: “fast food” and “clamato juice”, “tackiness” and “wackiness”, “Christmas bonuses” and “customer service departments”, “wild goose chases” and “loose cannons”, “crackpots” and “feet of clay”, “slam dunks” and “bottom lines”, “lip service” and “elbow grease”, “dirty tricks” and “doggie bags”, “solo recitals” and “sleazeballs”, “sour grapes” and “soap operas”, “feedback” and “fair play”, “goals” and “lies”, “dreads” and “dreams”, “she” and “he” — and last but not least, “you” and “I”.

Although I’ve put each of the above items in quotation marks, I am not talking about the written words, nor am I talking about the observable phenomena in the world that these expressions “point to”. I am talking about the *concepts* in my mind and your mind that these terms designate — or, to revert to an earlier term, about the corresponding *symbols* in our respective brains.

With my hopefully amusing little list (which I pared down from a much longer one), I am trying to get across the flavor of most adults’ daily mental reality — the bread-and-butter sorts of symbols that are likely to be awakened from dormancy in one’s brain as one goes about one’s routines, talking with friends and colleagues, sitting at a traffic light, listening to radio programs, flipping through magazines in a dentist’s waiting room, and so on. My list is a random walk through an everyday kind of mental space, drawn up in order to give a feel for the phenomena in which we place the most stock and in which we most profoundly believe (sour grapes and wild

goose chases being quite real to most of us), as opposed to the forbidding and inaccessible level of quarks and gluons, or the only slightly more accessible level of genes and ribosomes and transfer RNA — levels of “reality” to which we may pay lip service but which very few of us ever think about or talk about.

And yet, for all its supposed reality, my list is pervaded by vague, blurry, unbelievably elusive abstractions. Can you imagine trying to define any of its items *precisely*? What on earth is the quality known as “tackiness”? Can you teach it to your kids? And please give me a pattern-recognition algorithm that will infallibly detect sleazeballs!

Reflected Communist Bachelors with Spin 1/2 are All Wet

As a simple illustration of how profoundly wedded our thinking is to the blurry, hazy categories of the macroworld, consider the curious fact that logicians — people who by profession try to write down ironclad, razor-sharp rules of logical inference that apply with impeccable precision to linguistic expressions — seldom if ever resort to the level of particles and fields for their canonical examples of fundamental, eternal truths. Instead, their most frequent examples of “truth” are typically sentences that use totally out-of-focus categories — sentences such as “Snow is white”, “Water is wet”, “Bachelors are unmarried males”, and “Communism either is or is not in for deep trouble in the next few years in China.”

If you think these sentences *do* express sharp truths, just ponder for a moment... What does “snow” really mean? Is it as sharp a category as “checkmate” or “prime number”? And what does “wet” really mean, *exactly*? No blur at all there? What about “unmarried” — not to mention “the next few years” and “in for deep trouble”? Ambiguities galore here! And yet such classic philosophers’ sentences, since they reside at the level where we naturally float, seem to most people far realer and (therefore far more reliably true) than sentences such as “Electrons have spin 1/2” or “The laws of electromagnetism are invariant under a mirror reflection.”

Because of our relatively huge size, most of us never see or deal directly with electrons or the laws of electromagnetism. Our perceptions and actions focus on far larger, vaguer things, and our deepest beliefs, far from being in electrons, are in the many macroscopic items that we are continually assigning to our high-frequency and low-frequency mental categories (such as “fast food” and “doggie bags” on the one hand, and “fret of clay” and “customer service departments” on the other), and also in the perceived causality, however blurry and unreliable it may be, that seems to hold among these large and vague items.

Our keenest insights into causality in the often terribly confusing world of living beings invariably result from well-honed acts of categorization at a macroscopic level. For example, the reasons for a mysterious war taking place in some remote land might suddenly leap into sharp focus for us when an insightful commentator links the war’s origin to an ancient conflict between certain religious dogmas. On the other hand, no enlightenment whatsoever would come if a physicist tried to explain the war by saying it came about thanks to trillions upon trillions of momentum-conserving collisions taking place among ephemeral quantum-mechanical specks.

I could go on and say similar things about how we always perceive love affairs and other grand themes of human life in terms of intangible everyday patterns belonging to the large-scale world, and never in terms of the interactions of elementary particles. In contrast to declaring that quantum electrodynamics is “what makes the world go round”, I could instead cite such eternally elusive mysteries as beauty, generosity, sexuality, insecurity, fidelity, jealousy, loneliness, and on and on, making sure not to leave out that wonderful tingling of two souls that we curiously call “chemistry”, and that the French, even more curiously, describe as *avoir des atomes crochus*, which means having atoms that are hooked together.

Making such a list, though fun, would be a simple exercise and would tell you nothing new. The key point, though, is that we perceive essentially *everything* in life at this level, and essentially *nothing* at the level of the invisible components that, intellectually, we know we are made out of. There are, I concede, a few exceptions, such as our modern keen awareness of the microscopic causes of disease, and also our interest in the tiny sperm-egg events that give rise to a new life, and the common knowledge of the role of microscopic factors in the determination of the sex of a child — but these are highly exceptional. The general rule is that we swim in the world of everyday concepts, and it is they, not micro-events, that define our reality.

Am I a Strange Marble?

The foregoing means that we can best understand our *own* actions just as we best understand other creatures’ actions — in terms of stable but intangible internal patterns called “hopes” and “beliefs” and so on. But the need for self-understanding goes much further than that. We are powerfully driven to create a term that summarizes the presumed unity, internal coherence, and temporal stability of all the hopes and beliefs and desires that are found inside our own cranium — and that term, as we all learn very early on, is “I”. And pretty soon this high abstraction behind the scenes comes to feel like the maximally real entity in the universe.