Chapter 3
The World of the Spirit

I. Knowing that we Know

There is in Western science a strong "reductionistic" streak, by which I mean the notion that all the properties of a complex system can be explained in terms of—that is, by *reducing* it to—its constituent parts. The whole thing may have started with Newton, who understood, for instance, that the gravitational force exerted by a body was nothing but the sum of the gravitational forces exerted by all its parts (whichever way one chose to break it up into parts). To some extent, reductionism may be labeled an intellectually lazy hypothesis: the assumption that everything that we do not know or understand is exactly the same as that which we know and understand, only bigger or smaller (like the "turtles all the way down" or "fleas upon fleas" hypotheses mentioned in Chapter 1); to some extent, also, it may be just another manifestation of the well known fact that "when the only tool you have is a hammer, everything looks like a nail." Yet, there is no question that the "reductionist agenda" in physics was immensely successful over several centuries, and it is therefore not surprising if success was, in many quarters, mistaken for absolute truth; or if other sciences (most recently, and notably, biology) should have felt the desire to co-opt that agenda, reducing, for instance, all living processes to the expression of genes, and even occasionally making deliberately outrageous statements, such as that human beings are "just" a vehicle for the replication of their genome.

It seems to me that most sensitive (and sensible) people must find reductionism distasteful, to some degree or another. The very fact of saying that something is "just" something else—the very use of the word "just," on which reductionism hinges—is demeaning. It denies the object's own identity, and with it its unique purpose, and its particular dignity; in short, everything that might give meaning to its existence.

In the book *Between God and Man: An Interpretation of Judaism*, Abraham Joshua Heschel writes:[1]

> In pre-nazi Germany, the following statement of man was frequently quoted: "The human body contains a sufficient amount of fat to make seven cakes of soap, enough iron to make a medium-sized nail, a sufficient amount of phosphorus to equip two thousand match-heads, enough sulphur to rid one's self of one's fleas." Perhaps there was a connection between this statement and what the Nazis actually did in extermination camps: to make soap of human flesh.

It has been a goal of the past couple of chapters to show in some detail the breakdown of physical reductionism at the quantum-mechanical level. It is, I believe, a necessary step to restore the dignity of the Universe, to see it as it really is, as constant source of creation, change,

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[1] The quote is also found in his book *Who is Man?*, p. 24

and life, as opposed to a dead, dull mechanism of gears; for the dignity of God himself cannot be recognized if we cannot recognize first the dignity of his creatures. It will, accordingly, be a goal of this chapter to reassert, against all remaining reductionisms, the dignity of the particular kind of creatures that are human beings.

There is, in fact, a form of reductionism that has survived, albeit with some modification, the breakdown of the grand mechanical universe scheme of Laplace, namely, the belief that the *only* causation mechanism at work in the world is what is conventionally called *bottom-up causation*. As in Laplace's scheme (where the notion, in fact, originates, or at least from where it derived originally most of its persuasive power), this is the idea that the behavior of all aggregates is *entirely* causally determined by the laws governing the behavior of their parts. Where the ultimate laws are found to be, as in the case of quantum mechanics, probabilistic rather than deterministic, the consequences of bottom-up causation can no longer be equated with fatalism, but they can still be modeled, presumably, by a combination of "randomness," or "chance," and deterministic laws—the kind of thing that could be simulated by a computer program, albeit a "probabilistic" one[1].

Against bottom-up causation stands the idea that some structures are so complex that their behavior, in effect, needs to be described by new laws of their own: this is the notion of "emergent behavior," (or simply "emergence") with the associated idea of "emergent laws." Hence, for instance, an animal's actions ought to be understood as dictated by "higher-level" biological imperatives, such as survival or reproduction, not by "lower-level" "mechanical" processes such as the particular arrangement of the neurons in its brain[2].

On a certain level, nobody has a problem with the idea of emergence, or of emergent laws, *as a shortcut* for explaining the behavior of some systems: it is certainly much simpler to say that an animal drinks because he is thirsty, than to postulate that he does it because his neurons tell him to, mostly because the latter explanation, in order to be a proper explanation and not just a hypothesis, would require one to actually figure out what each neuron is doing when an animal feels thirsty. Similarly, at a much lower level of complexity, chemists explain how compounds are formed by invoking chemical laws that are conceptually much simpler than actually having to solve the underlying physical model, to wit, the Schrödinger equation in a very high-dimensional space. And yet—and this is the important point—chemists do not doubt that, in the final analysis, the behavior of the compounds they observe is determined *solely* (at least, of course, to the extent that anything is determined in the microworld) by the Schrödinger equation for all the constituent particles, and most biologists would argue as well that the behavior of the animal *is* ultimately determined by his neurons: "to be thirsty" is just a shortcut, a name we give to a certain state of the brain.

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[1] That is to say, one equipped with a "random-number" generator.

[2] A number of arguments for emergence, with a few references, may be found in the article *Physics and the Real World*, by George F. R. Ellis, in the July 2005 issue of *Physics Today* (vol. 58, no. 7, p. 49).

The main feature of the world that believers in top-down causation want to see officially acknowledged, as it were, is purposefulness: we, as well as many animals, do things primarily for a purpose, and we would like to believe that this purpose—not some random arrangement of neurons—*is* the real reason for our actions. There would certainly be a correlation between our resolving to do something and the state of our brain, but in the top-down model the causal chain is reversed with respect to the conventional, bottom-up explanation: our having resolved to do something is what (presumably) causes our brain to adopt a particular configuration, rather than vice-versa.

It cannot be emphasized enough, I think, that, however "natural" the bottom-up explanation may appear at first glance, it really is based on a materialistic, mechanistic model of the world that has been made obsolete in fundamental ways, not least of which is the fact that, at the *very* bottom of the ladder—the quantum level—one finds a plethora of "effects" for which *no* cause can be identified. Similarly, the notion that everything in the world must be explainable in terms of arrangements of matter and energy breaks down when one considers that the ultimate explanatory "object" of modern physics, the quantum field or wavefunction, is itself "made of" *neither* matter nor energy, as explained in Chapter 1, and is not even entirely an objective "thing"—it has a strong subjective component as well, as representative of our "state of knowledge." Proponents of what might be called "strong emergence"—that is, the notion that not *all* emergent laws are reducible to lower-level ones—also like to point out that the bottom-up reductionism of classical physics implicitly assumes that one is dealing with closed systems, where all the "constituent parts" parts can be identified, none are added or removed during the system's evolution, and all external influences are negligible—none of which describes, even remotely, a living being. So the entire scheme is really pretty much up in the air, and there is plenty of room conceptually for alternative causation models, if one wishes to consider them.

On the other hand, reductionists may point to the existence of a number of computer models—computer programs, which are the epitome of bottom-up processes—that are actually quite successful at simulating emergent behavior. For instance, a professional chess player could certainly give you a good explanation for why he has moved a particular piece, and the explanation would involve the emergent qualities of understanding, intention and purpose; but a computer program could counteract with an equally good move that is not based on any of these things, merely on following literally a set of pre-programmed instructions. Defenders of bottom-up reductionism would then argue that there is no need to postulate any additional mechanisms at work in the world, as long as the ones already known can account for all the observed behavior. Opponents would, presumably, argue that the computer simulations of "life" that we currently have do not even begin to scratch the complexity of real living systems, and as such, they may only suggest, but not actually prove anything. We probably do not even have, as yet, a thorough "bottom-up," mechanistic explanation of the way a protein folds.

While it is relatively unimportant, for the purpose of this book, whether "strong emergence" plays a part or not in the ways other living beings respond to or learn from their environment, my purpose in this section is to argue that there is one very important instance of genuine top-down

causation in the world, that needs to enjoy at least *some* degree of autonomy with respect to all the known lower-level causes. This is the case of the human mind, particularly with regard to its ability to apprehend the truth—especially mathematical and scientific truth—and to cause actions that depend in a fundamental way on such an understanding.

To begin with, notice that, whatever the computer simulations might suggest about other living beings, the fact that they have been designed by human programmers makes them, actually, a product of the human mind: they are, in a sense, merely assistants to the programmer's mind. Since the program required, in order to come into being, a human's understanding and purpose, it is logically impossible to conclude from whatever it does that these human qualities do not really exist, or that they lack the power of causation that I will attribute to them here.

Beyond this, there are two basic arguments for top-down causation regarding the human mind. The first one, which was essentially already presented in the previous chapter, is that if everything we do or believe is ultimately determined solely by bottom-up processes, the very foundation of the concept of truth disappears, and with it the possibility of science itself: if Laplace is just an automaton, there is no reason for me to listen to anything he might say. Introducing a degree of indeterminism or unpredictability into the picture, as we did in the previous chapter, does not change the basic problem, which is that we need to believe that when Laplace explains to us the principles of Celestial Mechanics, there should be at least a substantial degree of probability that he is doing this *because they are true*, not because of random firings of his neurons.

Put bluntly, we need to assume that truth—abstract truth, at that—must have some, relatively independent, causative power of its own. This may sound far-fetched, but it is, in fact, an implicit assumption that all scientists work with. This is why we publish papers, give talks, or teach at universities: because we believe that, at least more often than not, truth will be recognized as such and will empower people accordingly. At those times, we do not stop to wonder whether this deep-seated belief is compatible with a belief in an exclusively bottom-up, "materialistic" causation model: to the contrary, we believe that people will come to recognize the truth *because it is the truth*, independently of the way their brains may have been wired. Or, rather, if pressed, we would probably say that people's brains have been wired, for the most part, "to recognize the truth;" but this means, if it means anything at all, *precisely* that they have been wired so as to be *open* to top-down causation of the sort we are describing here.

We may ask how does this, in fact, work—and we will run, ultimately, into a mystery, for this is nothing short of a breakdown of the bottom-up causation model with which we are so well-acquainted, and, as with quantum mechanics at the other end of the ladder, we cannot very well imagine what to put in its place. But some of what is going on is obvious. The human mind must have enough relative autonomy to be able to reflect, meaningfully, on *ideas* themselves. We must not simply know things: we must be able *to know that we know*—because that is what it means to *know* that something is true. It is this capability for reflection of the human mind—to turn itself on itself, to examine mental objects themselves as if they were sensory data—that

makes our unique relation to the truth possible.

The physicist and mathematician Roger Penrose has, in a series of books—beginning with *The Emperor's New Clothes* and *Shadows of the Mind*—presented a formal proof that, in fact, our ability to recognize or apprehend mathematical truth is a non-algorithmic process; in other words, it cannot result from lower-level, bottom-up causation processes, of the sort that could be codified (possibly including randomness) as instructions for a computer program. This is exactly what we should have expected from the above considerations. Moreover, his proof makes use of Gödel's theorem, which involves self-reference in a fundamental way (the question being whether one can prove the self-consistency of a formal logical system *from within the system*, that is, using nothing but the system's own axioms[1]); it does not seem too much to assume that it is precisely the self-referential ability of the human mind—its ability to know itself, to know that it knows—that makes it impossible to reduce its functioning to that of a program.

Perhaps the strangest criticism leveled at Penrose's proof is that "there are people who believe things that are not true." But this is fine, and in fact it is just as we would have expected. Nobody is claiming an *absolute* causative power for the truth—one that would override everything and make it impose itself upon everybody and under every circumstance. We are just claiming a *relative* autonomy for the truth-finding part of the human mind; meaning that the process should be not *entirely* reducible to other causes, that it should contain a kernel of irreducibility. In practice, truth will have to compete with other causes in order to establish itself in anybody's mind, and because we are ultimately free we should even be able to reject it if we wanted too. Only a totally deterministic world, a world of machines, not people, could be built so as to ensure that no one ever makes a mistake.

II. The Speed of Thought

As mentioned in the previous section, there is another compelling argument to show that "bottom-up" causation must be at work, at least to some extent, in the human mind; or, more precisely (at a minimum, as it were) that the workings of the human mind must substantially involve causes that are not (or not to any significant degree) at work among the other animals, including our closest biological relatives.

For the purposes of this subsection, I am going to assume that the conventional explanation of biological evolution as being due exclusively to bottom-up causation is essentially correct, if only because this is much simpler (and on the whole, less controversial) than to postulate any other unknown mechanisms. The proof of the above claim follows then simply from the observation that this conventional biological mechanism is utterly inadequate to explain the extent, depth and diversity of human *cultural* evolution over the past few thousand years.

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[1]The answer is negative

Indeed, suppose the contrary; suppose that *nothing* is at work in the process of human cultural evolution, other than the same bottom-up processes that drive biological evolution: specifically, the genetic "wiring" of certain patterns of behavior in the brains of the higher animals, as a result of chance mutation and evolutionary pressures. The point is that we know how these processes work (or a least we have a plausible idea), and, by their own nature, they require an exceedingly long time to generate any substantially new "ideas"—as a glance at the record unmistakably shows.

Take beavers, for instance, who can build remarkably good dams—an ability so uncanny that, if we are to believe Fenimore Cooper[1], some native americans used to attribute to them almost human minds. Yet, apparently, this behavior is entirely hard-wired, genetically determined: beavers can build dams without ever having seen another beaver doing it. It boggles the mind to try to imagine how such a skill may have developed essentially through "blind" (though evolutionarily directed) trial and error at the genetic level; but there is no question that it must have taken an exceedingly long time to bring to its current status, a little improvement at a time: probably thousands of generations, perhaps hundreds of thousands of years. Moreover, it is the sort of thing one does not expect to happen twice by chance, certainly not twice to the same creature: and indeed beavers have not gone on from building dams to building, say, aqueducts of water mills.

Compare this to human beings, who less than a hundred years after having built the first airplane had landed a rocket on the moon. And this is just a small sample. Over the past couple of thousand years we have created cathedrals and skyscrapers, invented pianos and violins, catapults and atomic bombs; while beavers are still building the same dams they were building thousands of years ago, and our closest animal relatives, chimpanzees, have not moved very much beyond the stage of poking at termites with a stick.

The conclusion is inescapable: the exceedingly fast time scale of human cultural development cannot be explained at all by the same kind of bottom-up causation that is (presumably) responsible for biological evolution. There is something else going on.

The above is the argument, so to speak, as seen from the outside; but, of course, being human, we can also look at what is going on from the inside. What we find is simply that human cultural evolution is Lamarckian, rather than Darwinian: it relies fundamentally on "the inheritance of acquired characteristics"—in our case, knowledge. This is something that Lamarck[2] thought could happen at the biological level, but in fact does not[3]: there is no way, for instance, for the son of an athlete who has trained to be a great discus thrower to literally inherit his father's

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[1] See *The Last of The Mohicans*, ch. XXVII.

[2] Jean-Baptiste Lamarck (1744-1829), an early proponent of the idea that evolution occurred and proceeded in accordance with natural laws.

[3] Only at the single-cell level does it (very rarely) happen that an organism absorbs another's DNA into its own, or (as in the case of mitochondria) in a "symbiotic" partnership.

ability. On the other hand, there is an easy way for any human being to acquire all the engineering knowledge he will need to build dams, or anything else, and even to improve on the current designs: all he has to do is go to college. Obviously, this Lamarckian evolutionary process is intrinsically much faster than having to wait around for the "right" mutation to happen in your children's genes by chance.

It is tempting to attribute this extraordinary human advantage entirely to our remarkable language abilities, but the truth runs deeper than that. A mute teacher could probably teach all of Euclid's *Geometry* to an illiterate student, if only he were willing enough to teach and the student willing enough to learn. The essential ingredient is, rather, what I said in the previous section: our awareness of our own knowledge, and our ability to consider it critically[1].

It is, I think, instructive to consider how one might try to get something like the human cultural evolution to happen in a purely algorithmic way, and why it would not work: and then to compare it to the way teaching does take place among animals—for indeed, many animals teach their young a number of survival skills, and presumably they do this under the influence of "hard-wired," algorithmic instructions. But the thing is that, for most animals, it is relatively simple to imagine the necessary algorithm. A mother cat, for instance, could have a series of instructions along the lines of "perform hunting-related moves often in front of your cubs"; and she would do it, without really knowing that she is teaching, and the cubs would pick them up and learn, without really knowing that they are learning.

But it is totally impossible to write a similar algorithm for "unconscious" teaching for human beings (and we know that our teaching is not done unconsciously, anyway!). The naïve approach —a single instruction along the lines of "pass on to your descendants any valuable knowledge that you have gained"—is probably, in some form, already in our genes, of course; but it presupposes that we know *what* we know, and that we have the ability to sort it out and evaluate it meaningfully. And the "brute force" algorithm "simply download to the next generation every last bit of information that you have acquired," besides not actually describing what is going on, is simply unworkable: you'd end up overloading your descendant's minds with tons of junk in a couple of generations. The only "mechanism" that works is the one that we actually have, and it relies fundamentally on a non-mechanical ingredient: the extraction of *meaning* from the acquired knowledge.

In any case, the conclusion from all of the above deserves to be restated: the speed of human cultural evolution is *completely incompatible* with the assumption that only bottom-up causation is involved, at least through any of the processes that we believe to be at work elsewhere in the animal world. In the next section, and for the sake of completeness, I will try to present a way to look at this remarkable difference between humans and other animals, and perhaps to make it a little easier to swallow for die-hard evolutionists; but first, in the remainder of this section, I would like to address (or maybe head off) some of the difficulties that the postulate of a "top-

[1] Of course, it is quite possible that language may play an essential part in developing this awareness.

down" mechanism of causation, at work in our minds, might pose for some of us.

The main difficulty, I think, is already there, with the word "mechanism." In everyday terms, it might be tempting to summarize all the above by saying that "the mind" appears to have enough autonomy from "matter" to actually be able to "exert a force upon it." The abundance of quotation marks in this sentence, however, is meant to remind us again of the limitations of our language. We do not really know what "the mind" is any more than what "matter" is, when it comes to that; which is why I keep using the very general terms "bottom-up" and "top-down" causation[1], instead of pretending that I (or anybody else) am qualified to draw a line somewhere and define "matter" as being on one side, and "mind" as being on the other, and calling this "mind over matter" and that "matter over mind"; I do not know whether such a division is possible, or meaningful. But the worst problem is with the expression "exert a force on," because it immediately suggests all the wrong things: especially, the sort of gear-like mechanisms, and collisions of little billiard balls, that we really need to try to go beyond, because it should be clear by now that they cannot describe everything that is going on in the world.

Yet most of us (especially, perhaps, physicists) cannot help it. We hear the word "causes" and we translate it as "forces," in the Newtonian sense, and we start imagining mechanisms for pulling and pushing little pieces of matter around. We forget that, while all those little models of the world worked extremely well for a couple of centuries, they were, even then, and in the final analysis, only approximations to a more elusive and—probably—ultimately unknowable reality; we may be forgiven our obstinacy a little because they were truly an amazingly good approximation; but we perhaps would do well to remember that the real development of all those physical models was not as neat and tidy as the textbooks may have had us believe. There may not even have been, strictly speaking, a time in which every prominent physicist on earth believed in what we now call "classical physics," as if it were a single, self-consistent model of the universe (of *some* universe, at any rate). Laplace's famous "atoms," for instance, were still seen as hypothetical by many around the turn of the twentieth century. Newton struggled with the "mechanism" for the force of gravity all his life, because he could not really understand how "action at a distance" was possible; in the end, he had the honesty to admit that he just did not "understand" it, with his famous "hypothesis non fingo." But everybody else around him, and after him, was "feigning hypotheses", that is to say, imagining mechanisms for all sorts of things —and most of them were wrong; like imagining that heat was a fluid, or that electromagnetic forces were carried—mechanically—by some kind of "ether;" or that light was a stream of particles, or a wave, or then a stream of particles again.

When quantum mechanics came about, Bohr and his school basically said that what matters in the end is *the fact*—the empirical data, the *observation*—and not necessarily the mechanism by which it comes about, which is almost always hypothetical and sometimes, especially where

[1] Or we could also say, à la Penrose, "algorithmic" and "non-algorithmic."

quantum mechanics is concerned, simply may not even "be there" to be found[1]. Of course, we should be reluctant to believe in something we have never seen before, if we cannot imagine how it works; but this elementary caution cannot be applied to the mind, for we live with it every day and *we know that it works.* To claim that it cannot have the sort of autonomy and causative power that I have postulated for it here, merely because we cannot explain these things in terms of some "mechanism," is to miss the whole point, namely, that the *reality* of the (relative) autonomy of the human mind is evidence for a dimension of existence that is *beyond* description in terms of little mechanical—or physical, or chemical—models.

None of the above, of course, means that one should not look for "mechanistic explanations" of many mental functions, or that in many cases such models should not work; on the contrary, as I have pointed out before, the predictive power of algorithmic, "bottom-up" approaches to the study of all kinds of natural phenomena is remarkably vast. But there will be, all the same, some aspects of the mind—including, most importantly, its ability to "know that it knows"—that must always resist such an explanation; we can be sure of this by Penrose's theorem, by the evidence of the "top-down" nature of human cultural evolution, and, ultimately, by the evidence of the possibility of scientific knowledge itself.

Again, one does not need to be a neurologist to realize that the working of our minds has to be, to some extent, conditioned by the lower-level processes going on in our bodies; it is enough to have had a drink or two at some point in one's life. But there is a big difference between "partly conditioned" and "wholly determined," and it is in that vast territory that we normally live. And, again, note the word "normally." Even in quantum mechanics it is possible to constrain a system —say, an atom again—so that it will not decay, or decay "almost certainly" in a specific direction, or at an almost predetermined time; but this does not mean that the atom isn't free to do all these things "whenever it wants" in its natural state, that is, if only we do not interfere with it. Similarly, the fact that you can take someone's liberty away from them does not, in the least, prove that liberty did not exist in the first place; if anything, the opposite would be the case. I am not denying the possibility of a reductionist explanation for why a drunken engineer cannot design a dam; only the possibility of a reductionist explanation for why a sober one *can* (and, most importantly, knows that it is so).

Ultimately, to deny the human mind its power of understanding and self-reflection, or to attempt to reduce them exclusively to a manifestation of bottom-up processes, is philosophically a manifestation of what G. K. Chesterton, more than a century ago, in his book *Orthodoxy*, called "the suicide of thought": people using their minds to convince themselves that they are, in fact, incapable of rational thought. (Which, of course, perhaps *they* are.)

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[1] A theory, such as quantum mechanics, that connects our observations and possesses a great deal of predictive power may be said to, eventually, become itself a description of new types of "mechanisms"; but these will typically not be reducible to the ones previously known, and may at most bear a passing resemblance to them. For instance, nowadays one explains many features of quantum experiments making use of a property known as "entanglement;" yet, the essence of the celebrated Bell's theorem (due to John S. Bell, in 1964) is precisely that there is no "classical," local mechanism that can account for the correlations seen in some entangled states.

But let me go back for a minute to the physicists, because I still see the possibility of the *other* danger that comes with an unremittingly mechanistic view of the world[1]: namely, that when confronted with something that clearly transcends the explanatory power of your model, you stubbornly continue to try to "understand it" by modifying your model a little, here or there, or coming up with an "explanation" that *looks* a lot like your previous model, but does not *really* explain anything; and, along the way, you end up postulating, and maybe even believing, some totally absurd and outrageous things, just because in some meaningless way they resemble the mechanisms that you do not want to give up. We have seen a lot of this sort of thing happening with quantum mechanics: with many-worlds theories, and with all sorts of hidden-variable models—some, of course, more outrageous than others, none of them really explaining anything. And there is a definite danger of something like that happening when you start talking about "the mind" "exerting a force" over "matter."

This is why I would like to say again, as clearly as possible, that I do not believe that thinking of what's going on in terms of "classical" forces is at all a good idea: we really need to accept the breakdown of the predictive power of that old model and start listening to what the world is trying to tell us, rather than trying to tell it how we think it has to be. But even, if I may get technical for a moment, I think the word "force" would be *technically* wrong because there is no evidence that I know of that the workings of the mind *produce* energy; whatever is going on in our brains when we think, it is much more likely to be, in my opinion, like what happened in the example I gave in the last chapter about a collection of decaying atoms. It is not warranted to think of whatever causes some particular atom to decay at a specific time as a "force" (like somebody giving the atom a "push"), because, unlike when you are actually pushed, the system of the decayed atom plus the photon that it has emitted does not have any more total energy than the atom did before it decayed. In the different patterns of excited and unexcited atoms that I talked about, the difference is not in the total energy, just in how that energy is distributed. So whatever "causes" a particular pattern to happen—and I have a strong suspicion that this applies to the mind-brain system as well—it would be wrong to think of it technically as a kind of "external force," because it does not create energy in the physical system; it just causes the available energy to get shuffled around so as to favor the emergence of a particular configuration (of, say, neural connections in the brain?) over any of many other possible configurations with the same total energy.

I realize that, in spite of this warning, people will continue to do experiments on telekinesis, or the mental bending of spoons, or any number of other claimed "mind over matter" phenomena; and, of course, as a scientist, I cannot very well ask other scientists to stop experimenting anyway; but it seems to me that this is taking a singularly poor view of the "power of the mind," and moreover, one that is largely irrelevant to the main issue under consideration here. We *know* where the true power of the mind lies; and it is not in parlor tricks. Anybody who doubts the

[1] The first danger was, as I just explained, that you may refuse to believe in the reality of something because you cannot see a mechanism for it.

power of ideas to influence the physical universe needs to look only at the past few thousand years of human history, for better and for worse— the bloody revolutions, the human rights declarations, the printing press, the industrial revolution, the development of nuclear energy; *that* is the awesome power that stems from our ability to reflect upon our thoughts, to "know that we know." Or just, if you are inside a house, stop reading these lines for a moment and merely look around. You will not find a single piece of matter around you that has not been given shape by an idea.

III. Discontinuity from Continuity

In the already mentioned Chapter 3 of his book *Orthodoxy*, entitled "The suicide of thought," G. K. Chesterton had this to say about the theory of evolution:

> Evolution is either an innocent scientific description of how certain earthly things came about; or, if it is anything more than this, it is an attack upon thought itself. If evolution destroys anything, it does not destroy religion but rationalism. If evolution simply means that a positive thing called an ape turned very slowly into a positive thing called a man, then it is stingless for the most orthodox; for a personal God might just as well do things slowly as quickly, especially if, like the Christian God, he were outside time. But if it means anything more, it means that there is no such thing as an ape to change, and no such thing as a man for him to change into. It means that there is no such thing as a thing. […] This is an attack not upon the faith but upon the mind: you cannot think if there are no things to think about.

Chesterton was referring back then to the habit, which persists undeterred among a certain kind of evolutionary biologist, of stating categorically that human beings are "just apes." This is the most popular current type of reductionism, frequently buttressed, these days, with the additional claim that humans are "98% genetically identical to chimpanzees," or numbers to that effect.

The point of Chesterton's argument could be rephrased as follows: the very first duty of science is to organize the world into categories that we can turn into objects of our thought; by blurring the divisions, or pretending that there are no differences of any consequence, between the two rather obvious categories of "human" and "ape," "science"—or rather, an irresponsible group of scientists—is, in effect, rendering rational discourse itself impossible.[1]

There is, in fact, plenty of circumstantial evidence that, in spite of all their claims to the contrary, these scientists are quite aware of the fact that, in just about every way that matters, humans are *not at all* like apes. You don't see, for instance, evolutionary biologists rushing to mate with chimpanzees, or sending their children to chimpanzee school; or trying to promote their books among the gorillas, or applying to them for a research grant; and, in spite of the extravagant

[1] Fortunately, not every scientist is like this. I highly recommend the book *What It Means to Be 98% Chimpanzee*, by Jonathan Marks, for a very good critical look at "genetic reductionism" (and lots of other interesting stuff).

praise that they tend to lavish on the tool-making abilities of the great apes—"have you *ever* seen a better crafted stick for poking into termite mounds?"—I suspect that they would still rather have human beings build their houses, or repair their cars.

So if humans are really not at all like apes in any important way, the obvious conclusion is that the famous "98% genetic resemblance" is a meaningless measure of resemblance—except to the extent that it does, in fact, point to a mystery: how can two creatures so similar in one way be so very dissimilar in just about every other way?

In fact, it is not that terribly unusual in the physical sciences to find examples where a very small change in a parameter results in a system with very different properties from the original one. The archetypal example in physics is provided by phase transitions: solid water (ice) is very different from liquid water, but it is the same substance, and all it takes to make it change from one form to the other is a very small change in temperature across the freezing point.

Figure 1 shows the specific volume (the inverse of the density) at constant pressure for water as a function of temperature across the boiling point. The seemingly horizontal part of the graph corresponds to liquid water and shows an almost imperceptible change of volume with temperature (enlarged in the inset); the upper branch of the figure, on the other hand, corresponds to the gaseous state (water vapor, or steam), which is the stable phase above T = 100 C. Not only there is an abrupt change or discontinuity in the curve, but also a very large change in the slope: in the liquid state, the density changes by less than 1 part in one hundred thousand over a range of temperatures of 25 degrees, whereas in the gaseous phase the change over the same range is over 20 percent. In other words, the gas expands with temperature more than 10,000 times faster than the liquid. And note that, in both cases, we are talking about a single pure substance; by one measure (chemical composition) the two systems—liquid water and steam—are "100% identical." But of course, this is, in this case, a totally meaningless measure.

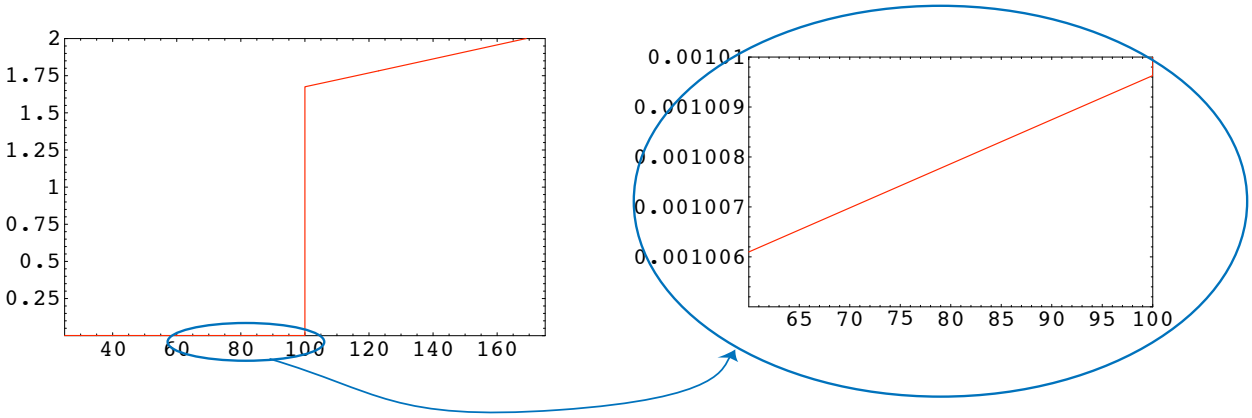

Figure 1. Specific volume of water and steam (vertical axis) versus temperature (horizontal axis, in degrees centigrade). The right-hand side is an enlarged view of the region of temperatures between 60 and 100 C, showing that water expands with temperature also, but much less than steam does.

Not all phase transitions exhibit the same kind of dramatic discontinuity. Figure 2 shows the number of photons in a laser as the so called "pump parameter" *p* is varied across the "threshold" for laser action. For values of *p* smaller than 1, the laser is not really a laser, but more like a fluorescent tube. This time, the curve is continuous, and even the apparent discontinuity in the slope turns out to disappear when one zooms in very, very closely.

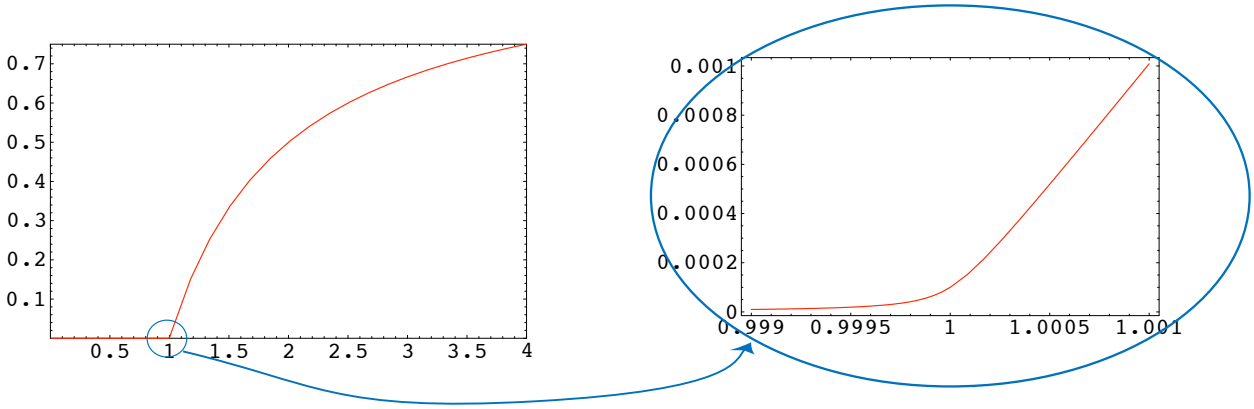

Figure 2. Number of photons in a laser cavity (vertical axis, in units of 100 million photons) versus pump parameter *p* (horizontal axis). The figure on the right is a greatly expanded view of an extremely small region around the transition point p=1, showing that, on this scale, the transition is, in fact, smooth. I suggest that experiments looking for specifically human traits in primates are equivalent to probing a similar, very small region of the corresponding parameter space, just below the phase transition point.

There are, I think, a number of ways in which it may be enlightening to think about hominization —the transition from primates to humans—as a sort of phase transition, in which a very small change in a "control parameter"—presumably encoded in our genes—resulted in a dramatically different kind of creature.

To begin with, consider the fluctuations of the properties of the system around their average (stable) values. Near the phase transition points, it is common to find regions where the density (or some other relevant property, like the magnetization) spontaneously undergoes a large fluctuation that brings it to a value closer to that of the unstable phase (for instance, for a liquid just below the boiling point, a region of the liquid might suddenly become much less dense, almost forming a small bubble of vapor; or conversely, for the vapor above the boiling point, a large fluctuation may cause a droplet to almost condense). Most of the time, however, these fluctuations just disperse without actually completing the transition; but occasionally a small bubble or droplet may become stabilized around a small impurity, such as a speck of dust. As you approach the phase transition point, the fluctuations become larger, more frequent, and more nearly stable; yet, as long as the system is still below threshold, eventually they dissipate, or at most coalesce into a small inhomogeneity that fails to grow.

This, I think, is remarkably similar to what has happened with all attempts to teach human language to the great apes. By all evidence, they appear to be "just below threshold": they may learn a few dozen words, make a few sentences, and then they hit a ceiling and stay there. So

they are below the "language threshold" (above which people just start talking and talking, and in no time at all—from an evolutionary perspective—you get the works of Shakespeare); and they are also below the threshold for cultural evolution, because although occasionally they will teach other apes, their children especially, a few words, the number of words transmitted goes down with each generation. We could say that we humans have introduced a "fluctuation" in the system, and, because the system is below threshold, the fluctuation dies down eventually (or at best condenses into a small, barely stable anomaly).

There are other ways in which the phase transition metaphor is suggestive. Consider, for instance, boiling an amount of water from a pan, turning it completely into vapor. Before, the water was confined by gravity to the pan; afterwards, its molecules are free to explore all the space available. The phase transition in this case has opened up a new dimension for the system, made a new "degree of freedom" available. Note that the *potential* was already there: we have not created the vertical dimension, we have simply made the system capable of reaching into it. Translated to the case of human beings, this suggests that the potential for self-reflection, the *dimension of meaning*, was already "there," as a possible "space" for us to explore[1]; that it had been "there" since the beginning of time, and all it took was to "cross the threshold" of hominization for our minds to become *open* to it.

The vertical dimension is also suggestive of the new way of looking at things that came about with hominization: namely, looking at things *from above*, so we can actually see where everything fits in "the big picture." Up to that point, as I discussed in the previous section, evolution had been solving problems by trial and error, one at a time; like a rat in a maze, trying any number of blind alleys until it chances upon an opening. The human cultural evolution, on the other hand, is *guided* from above, by a mind that is aware of where it is and where it can go.

It may be worth pointing out as well that exploiting the dramatic differences brought about by phase transitions has resulted more than once in technological revolutions, in the course of human history. Many relatively static civilizations had harnessed the power of water, for many purposes, for centuries; but the much greater thermal expansion power of steam brought about the industrial revolution. Light bulbs were, in and of themselves, a wonderful invention; but consider all the things that the coherent light of lasers has made possible in the past forty years, from eye surgery to optical fiber communications—and, with them, the entire Internet.

This, I think, is the appropriate framework in which to place the ape to human transition: as a "phase-transition"-like event, in which a relatively small genetic change resulted in the unlocking of a whole new dimension, a whole new way to understand and to relate to the world, and a unique kind of creature, fundamentally unlike any that had walked the earth before.

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[1] This is certainly the case, at least, for mathematical truths. We did not "invent" the Pythagorean theorem, we discovered it.

And yet, of course, related to all of them as well. I am not taking back any of the things I wrote at the end of the previous chapter. Biologically, there is no question that we belong here—not just with the apes, but every other living thing. And, as I have already explained, the relative autonomy from bottom-up causation that I have claimed here for the human mind is *only* relative: in many ways we are, without a doubt, conditioned by the physics, chemistry and biology of our bodies.

The point, though, is that there are *two* dimensions, neither one completely reducible to the other; and we live in both. There is a world of bottom-up causation, endowed with what appears to be a "blind" creative force: new things are tried, seemingly at random, and only afterwards "selected" by an assortment of physical, chemical and biological processes; and there is a world of ideas, of reflective awareness, of *meaning*, where we choose to believe or do things because they are right, or true. Alone of all creatures—again, the evidence of the speed of our cultural evolution is incontestable—we bridge these two worlds, and it is easy to imagine that just about everything we do will, like a vector, have a component, however small, along each of the two dimensions. At one extreme will be actions and decisions—like the design of an engineering project—based almost exclusively on pure thought and rational and mathematical logic; at the other extreme there will be a number of actions that will be mostly instinctual in nature, and these will in great measure[1] be reducible to, or explainable in terms of, the physics and chemistry of our bodies. And there will be other—perhaps most—activities where the "physical" and the "spiritual" will be impossible to disentangle[2].

What seems clear, in any case, is that our distant relationship to the great apes (fascinating as these creatures are on their own terms) must be largely irrelevant to an understanding of who or what we are. Simply put, we really are a different species, separated by more than six million years of evolution, with a different environment and a different lifestyle, and even our bodies (let alone our minds) have necessarily evolved to reflect that. What we are is what *we* are; it is not what chimpanzees, or gorillas, or orang-outans are. This is not "anthropomorphism:" it is—as argued in Chesterton's quote at the beginning of this section—a basic methodological principle. If you want to find out what a species is like, you should actually study *that species*, not a genetically similar one[3].

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[1] But, certainly, not entirely. Even something as natural, biologically speaking, as a meal can be suffused with meaning and symbolism, depending on whether or not something is being celebrated, who is or is not present, and many other factors.

[2] Consider, for instance, what happens when we compose music: there is clearly a physical basis for our enjoyment of music, but there are also harmonic rules, known to the composer, that are ultimately mathematical in nature; and then there are the composer's own intention and mood, where again both physical and spiritual ingredients may come into play. (Think, as somewhat extreme examples, of Bach's *Passions*, or Eric Clapton's *Layla.*)

[3] The phase transition analogy also applies here. To fully exploit the power of steam, you need to deal with the physical properties of steam, not of liquid water; you cannot design a steam engine as if it was a hydraulic press. Similarly, nobody would have thought of developing, for instance, laser surgery, if people had been stuck on thinking of a laser as merely a "glorified lightbulb."

To see how silly the "98% identical" claims are, in practice, consider the following hypothetical scenario. Suppose that one of those people that are glad to define themselves as "mere apes" was turned down for a job because he happened to have a second cousin who once ran afoul of the law[1]. Presumably the self-styled "ape" would find this highly unfair, and argue strenuously that his genetic resemblance to his no-good cousin (a virtual identity, from an anthropological standpoint) is completely irrelevant, and should in no way prevent him from being a wonderful human being—professionally, in any case. But if the no-good cousin in the state penitentiary is genetically irrelevant, how can the chimpanzee in a distant jungle possibly be relevant?

It is an obvious fact that we are, each of us, much more closely genetically related to *both* Adolph Hitler and Mother Theresa of Calcutta than to any chimpanzee, and this should suffice to give us an idea of the range of our potential, both for good and for evil. With this vast spectrum of possibilities open to us, the distant chimpanzees are, indeed, utterly irrelevant. It is to other human beings that we must look in order to learn how to be—and how *not* to be—human.

IV. God the Spirit

What does any of this have to do with God?

In the first chapter, I introduced the classical idea of God as the first cause: follow the chain of causation as far as you can go, to its very foundation, and call that foundation "God."

In the past two chapters, however, I have established the existence of *two* different chains of causation in the world. One is "bottom-up," and responsible for most physical, chemical, and biological processes; at the most elementary level, it appears to be founded on a balance of what looks like "blind" chance, and "order;" algorithmically, it appears as if it could be simulated by feeding "randomness" into deterministic laws. I have identified this with what I have called "the creative power of the universe," the power to constantly bring about new patterns of information, and to give some of them the chance and the means to become stable and grow, and even, for living beings, to self-reproduce. Accordingly, I have identified the ultimate foundation for this chain of causation with the aspect of God traditionally regarded as the Creator.

But there is also another chain of causation, one that is "top-down," that begins with our awareness of truth and our ability to study the contents of our own mind, to consider ideas critically, and to make decisions based on this. Neither one of these chains, I have argued here, is wholly reducible to the other, but neither are they wholly independent; the "mind" can certainly influence "the world," and vice-versa, and the "lower-order" processes in our brains clearly must be "indeterministic" enough to accommodate the actions and decisions of a self-aware mind. But they are *not* reducible to each other, which is the main point; and hence it is necessary to postulate God, as the First Cause, as *also* the source and foundation of this other

[1] It has been my experience that almost everybody has a second cousin like that somewhere.

form of causation: that is to say, as the source of our ability to conceive of the truth, and our desire and our ability to attain it.

This second aspect of God, clearly, corresponds very closely to what is called "the Holy Spirit," the third person of the Christian Trinity; and this ability of our minds that I have been talking about, this unique relationship with the Truth that we enjoy and that is thus founded in God—that may be thought of, without stretching the language too much, as a *gift from God*—is what constitutes our unique essence, what makes us fundamentally human: what Aristotle and Aquinas would have called "our rational soul."

It follows that the main characteristic of the soul may be expressed as an *openness to the truth*; and we may then think of the Holy Spirit as *the fundamental aspect of the Ultimate Reality that makes this openness to the truth possible*; that makes it possible for the truth to act, to have causative power. We may even stretch a point and think of the Holy Spirit as having the nature of Truth itself; although here we are already drifting into metaphor, in an attempt to express the inexpressible.

In any case. this basic idea of the fundamental importance of Truth to our whole being, to our full humanity, is not exclusively a Christian concept. Buddhists speak of the Dharma, the teaching, as a refuge and as a causative agent for liberation, or enlightenment; they even personify it as the Dharmakaya, the Dharma-body, and in this personification they refer to it as one of the bodies of the eternal Buddha. Ignorance and delusion—the opposite of truth—are the sources of suffering, which is dispelled by awakening and seeing—or recognizing, that is, seeing with awareness—the reality of things as they are. And the ability for this awakening, the essential component of human nature that we all carry within and makes this understanding possible is, in some of the more mystically-inclined Buddhist traditions, identified with *the Buddha himself*[1]. So the eternal, living Buddha is both the truth—the Dharma—and the ability to apprehend the truth (or the source of this ability): the Holy Spirit, in Christian terms.

It is, however, a distinctive trait of at least early Buddhism that it eschewed most metaphysical speculation, to focus almost exclusively on practical matters. From this perspective (most often, but not exclusively, associated with the Theravada tradition) it is not necessarily important to know from whence the mind gets its power to apprehend the truth, and to give shape to our entire reality: what matters is to recognize that it does have such a power, and then to learn to use it wisely[2]. And yet, there is no question that even early Buddhism contains, and even—superficially, at least—depends in part on, a great deal of material that, from a purely empirical perspective, can only be called speculative, including a detailed and exceedingly complicated

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[1] Or "the Buddha-nature."

[2] The *Dhammapada*, for instance, begins with these words:

> All that we are is the result of what we have thought: it is founded on our thoughts, it is made up of our thoughts. If a man speaks or acts with an evil thought, pain follows him, as the wheel follows the foot of the ox that draws the carriage.

cosmology that includes many heavens and hells, and an impersonal but all-powerful karmic order. Hence to ask, as Christianity has traditionally done, "how the order without relates to the order within": or, how "God the Father"—as the foundation of Existence—relates to "God the Spirit"—as the foundation of Meaning—is not "to complicate the uncomplicated" (to borrow a famous phrase from the Pali canon[1]), but to honestly attempt to come to terms with a reality that, at least as seen from "here below," *is* already complicated. We feel the need to know how the Spirit and the World fit together, ultimately, because we need to know how *we* are supposed to fit together, as creatures of both.

The last sentence implies the basic question with which all human beings must wrestle, in one form or another: here I am, now what am I supposed to do? Who am I supposed to be? What—if anything—is expected of me? We are able to ask these questions precisely because we have a "rational soul;" but the answers do not seem to be readily forthcoming.

Animals that rely primarily on instinct and uncritical learning of what their parents teach them do not appear to have this problem: a cat knows early on how to be a cat, how to be a *good* cat; what to strive for and what to avoid; and he or she goes on to live a blameless, unexamined cat life. We, on the other hand, have been known to say that "an unexamined life is not worth living[2]." We are confronted with choices, and we want to know what the right choice is; but we do not automatically know *how to know*.

Or do we?

A central principle of the philosophical position known as existentialism is that, for human beings, "existence precedes essence[3]." That is, first we *are*, we come into being, and only then it is decided (by us) *who* or what we are. We decide this—we *make* ourselves—without reference to any prior "essence." Or, to put it metaphorically: there is nothing "written" anywhere that says, "*this* is what a human being is supposed to be."

In a previous chapter I quoted from the concluding lines of Jacques Monod's book *Le Hasard et la Nécessité*. The full quote, given below, expresses a definite existentialist standpoint (italics are mine):

> l'homme sait enfin qu'il est seul dans l'immensité indifférente de l'Univers, d'où il a émergé par hasard. *Non plus que son destin, son devoir n'est écrit nulle part*. A lui de choisir entre le Royaume et les ténèbres.

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[1] *Anguttara Nikaya*, 4.174.

[2] Socrates, as quoted in Plato's *Apology*.

[3] This famous dictum apparently comes from a lecture by Jean-Paul Sartre, *Existentialism is a Humanism* (1945).

"*Man's duty is not written anywhere, any more than his fate*. It is up to him to choose between the Kingdom and the darkness."

The Biblical-sounding language used in this text serves—with deliberate irony—to emphasize the departure from traditional Western religious thought, according to which it would simply not be true to say that "Man's duty is not written anywhere." In traditional terms, Man has a duty that is given to him by God; the rules and prescriptions of the "Moral Law"—Monod's "Old Covenant"—are an expression of this duty. Traditionally, also, these rules have been seen as a more formal and better statement of something called "the natural law," an instinctive sense of right and wrong with which we are all supposedly endowed since birth.

The "moral law" has played an important role in Western theology and philosophy. Immanuel Kant based on it an argument for the existence of God, and this argument, with variations, is still popular. Kant's epitaph, taken from the conclusion of his *Critique of Practical Reason*, reads:

> Two things fill the mind with ever new and increasing admiration and awe, the more often and steadily we reflect upon them: The starry heavens above me and the moral law within me.

In the terms I have developed here, the above paragraph suggests two distinct ways to encounter God: outside us, as the Creator of the Universe, and inside us, as the source of the "moral law." A first question[1] is, whether the latter description may be justified, at this stage, as an alternative way to conceive of "God the Holy Spirit." There is, certainly, a fair amount of material in the Bible that would seem to strongly support this idea, beginning with Moses' pivotal role as the giver of the Law in God's name, and continuing with the example of the prophets of Israel, who, over and over again, are "moved by the Spirit of God" to call the people of Israel to repentance.

Moreover, there is a strong connection between truth and moral obligation, as indicated already by the fact that the same word is used, in the English language, to denote truth ("being right") and "doing the right thing.[2]" When the writers of the American Declaration of Independence wrote "we hold these truths to be self-evident: that all men are created equal…" they clearly understood that there were moral consequences that followed from the truths they were stating (even if they did not quite follow through on all of them at the time). In fact, as with many other such documents, like the Declaration of Human Rights, they were using these perceived truths as the foundation for the ethical or legal principles they were trying to establish. "Truth" and "good" are thus intertwined, to the point that most of us, I think, would agree that it feels almost like a moral duty to believe in a truth that has been demonstrated to us: truth has not only a causative, but what one might almost call a moral power.

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[1] A further question would be, as I have said above, how the two aspects are related. This will be the subject of the next two chapters.

[2] With subtle variations, the same is true in French, Italian and Spanish ("juste," "giusto," "justo"), German ("recht"), Japanese ("tadashii")…

Fundamentally, it is clear that the same mind that can reflect upon the truth or falsehood of its own ideas can also reflect upon the rightness or wrongness of some contemplated action, by comparing it to a standard. It is not too much of a stretch to assume that, just as it is our nature to want our beliefs to be right (meaning true), it may also be our nature to want our *actions* to be right; and, in any case, that we owe our ability to conceive of right and wrong, to the same basic principle to which we owe our ability to conceive of truth and falsehood.

We may then conclude that God, as the Holy Spirit—the upper end of the chain of top-down causation—is the source of our moral nature, or, at the very least, of the *rational* part of it. By this I mean, at a minimum, our ability to conceive of, and discern, right and wrong, and possibly also our desire, or natural inclination, to let our actions be ruled by these considerations; what one might call the foundations of a working conscience. Of course, all of this needs to be developed: we are not born knowing what is right and what is wrong, any more than we are born knowing how to do algebra; but we are born with brains that have the potential to grasp and respond to all this, that are open to, and have the potential to explore, "the dimension of meaning."

This much, I think, we can say safely; but going beyond that, and asserting that any particular set of commandments or precepts—even those that we might be tempted to call "the natural law"—comes *directly* from God is a somewhat questionable proposition. Unlike mathematical truths, which in a sense simply lie there to be discovered, independent, in their purest form, of any reference to the material world, moral truths are inextricably bound with the world of matter and energy, the world ruled by bottom-up causation through mostly deterministic laws, which lead to predictable consequences—at least, on average, and most of the time. It is obvious that moral action would be intrinsically impossible if the consequences of our actions were wholly unpredictable; but it is also true that, since nothing is wholly predictable in the world, absolute certainty that one particular course of action is for the best is intrinsically unachievable. This would appear to give to moral truths (or "rules") already a much more tentative nature than that of mathematical, or even scientific, truth.

We may also consider how something like a "natural law" might come about as a result of our biological evolution. Of course, with human beings, it is virtually impossible to tell what is innate and what is learned through early socialization; but it is not hard to figure out a rough outline of the kind of instincts or tendencies that would be most useful for us to have, given the kind of animal we are. The most important one, without a doubt, would be precisely a tendency to socialization: to bond with other members of the group, to do what others do (and learn from it), to cooperate with the group. Probably there should also be some inbuilt reluctance to cause serious harm, or kill, another member of the group; probably also a natural instinct to protect the very young, and perhaps also our mates or our closest kin; perhaps even some kind of tendency towards altruism. And, from the fact that our children need to be taken care of for a very long time (in animal terms), one might expect us to have some kind of a natural tendency to form relatively stable couples as well.

The thing is that, even if all of this could be called a "moral law," which it cannot really (nor, I think, would we want it to[1]), we could certainly not say that it has come *directly* from God; rather, it has come about from the processes of the world, from evolution and natural selection. It may be used as a starting point for reflection, and the conscious elaboration of a moral code suited to our biological nature, and to the extent that this process of reflection involves our God-originated ability for discernment, one might even say that God would be involved in it; but this is a claim that should not be made lightly, or else we may find ourselves in the embarrassing position of having to explain why the same God who told the Israelites not to kill in Exodus 20:13 would also tell them, in Deuteronomy 20:16, that "in the cities of these peoples that the Lord your God gives you for an inheritance, you shall save alive nothing that breathes, but you shall utterly destroy them[2]".

In summary, I would have to say that, at this point, and with the concept of God developed only this far, one can plausibly assert that God is the source of (the most important part of) our moral nature, but not that he is the direct source of any *specific* moral law. It seems better, overall, to think of God as the foundation of our capability for *discernment*, which we can bring to bear when confronted with (among other things) moral decisions. This, it seems to me, is consistent with most portrayals of the Holy Spirit in the Christian New Testament as a "teacher," and a source of both wisdom and moral fortitude. It also would seem to be consistent with the corresponding role played by what Thich Nhat Hanh calls the "living Buddha," the "Buddha within each of us."

It follows that any attempts to develop the idea of an "absolute" standard of morality will have to be postponed till later in this book, although some preliminary ideas are already advanced (in small print) below. In any case, I should point out that here I am also not fully embracing the existentialist understanding of human beings, since I am attributing to every human being an *essence* that is the rational and moral soul, characterized, at a minimum, by our intrinsic[3] desire —experienced as something akin to a moral obligation—to believe in things that are true.

Since the above discussion might leave me somewhat open to a charge of moral relativism, I think it may be necessary to present below, as it were, a preview of what I think is the correct way to introduce an absolute standard of wrong and right. This, however, depends on an understanding of the concept of God that I have not quite developed yet in this book[4], so it will have to be taken, as it were, in parentheses, until all the background material is in place.

One of St. Augustine's best lines is at the very beginning of his *Confessions*:

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[1] In particular, the consequences of the instruction to "assume that whatever everybody else around us is doing must be right" are all too often tragic; think of the Rwandan genocide, for instance.

[2] I.e., kill everybody, even the women and children; as detailed later throughout the book of Joshua.

[3] Doubtless developed through early socialization, but the potential, the seed, must be there from the start; otherwise no amount of socialization could bring it about.

[4] Although it was already anticipated in Chapter 1.

You have made us for yourself, O Lord, and our hearts are restless until they rest in you[1]

If "being with God" is the supreme good for a human being, then an absolute moral standard is easily derived from that: an action will be good if it brings us closer to God, and evil if it takes us away. Conventional "morality," understood as a set of precepts and rules, may then be regarded as a substitute for what really matters, which is *living with God*. (It is, nonetheless, a necessary substitute, for none of us are capable of the kind of sustained mindfulness that can be described as "living with God" 24 hours a day.)

This understanding, I think, may be the clue to some of the Tao Te Ching's most cryptic statements, such as "When the great Tao is forgotten, goodness and piety appear," (Ch. 18) or "Throw away morality and justice, and people will do the right thing." (Ch. 19). It is almost certainly the key to St. Paul's emphasis on faith (which for him was an all-encompassing vital experience) over "the works of the Law." It is also, I would dare say, the reason why Jesus issued only *one* "new" commandment: to love one another; for "God is love, and he who abides in love abides in God, and God in him."[2]

"Love, and do what you will," is how St. Augustine also reportedly put it[3]. But this is a teaching that needs to be always carefully balanced against the cautionary words of the letter of James (which work just as well with the word "faith" replaced by the word "love"): "Show me your faith apart from your works; and I by my works will show you my faith."[4]

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[1] *Confessions* I, 1

[2] 1 John, 3:16

[3] *Sermon on 1 John* 7, 8

[4] James, 2:18