

Conflating Matter and Mind

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I've been asked to respond to criticisms of my paper "Converting Matter into Mind" (*PSCS*, Dec90). My reaction to these criticisms is this: "Yes, I could have been more careful in some details and choice of terminology, but the substance of my position is unaffected." The critics were guilty of two faults. First was a failure to read my work with sufficient care. Thus I've been charged with among other things failing adequately to distinguish cognitive science from artificial intelligence and failing properly to understand supervenience in relation to the hierarchical levels constituting the human person-points I took pains to clarify so as not to be misunderstood. Second was the allegation that I claimed to prove more than I actually proved. Thus Gregory Clark contends that "Dembski has not proven that, from God's perspective, to be valuable is to be intelligent," when such a demonstration was not my intention. In the sequel I want both to recapitulate my arguments and to clarify my motives for writing "Converting Matter into Mind" (henceforth abbreviated CMIM).

My article draws from science, philosophy, and theology. Each of these fields brings a different perspective to bear on the mind-body problem, and particularly on the claim that computation can render a full account of intelligence. I want to examine what these disciplines have to say in turn. Concerning the connection between computation and intelligence science poses both a theoretical question and an empirical challenge. The theoretical question is this: Given our scientific knowledge of the world, is it even possible/conceivable for computation to encompass intelligence? The empirical challenge is this: If we can build a machine which displays a sufficiently broad spectrum of intellectual abilities, this would prove that computation encompasses intelligence.

The theoretical question is usually answered first. An example will clarify why this is the case. Imagine humans have colonized Mars. We would like to communicate with our relatives on Mars much as we talk to our neighbors by telephone. AT&T wants to make this desire a reality. The empirical challenge confronting its engineers is to construct a device which will allow interplanetary dialogue without time lags. Theoretical considerations, however, demand that engineers renounce this quest since signals can be transmitted no faster than the speed of light, a fact which forces an inevitable lull whenever the speaker changes in an interplanetary dialogue. Theoretical considerations obviate the empirical challenge.

Of course one can always argue that the empirical challenge is unaffected-indeed, if the appropriate device can be fabricated, we may just have to alter our theory. But there comes a point when the empirical challenge must be withdrawn, lest the challenger be relegated to the company of angle-trisectors and circle-squarers. In the case of cognitive science, it is perfectly true that devices like *2001 Space Odyssey's* Hal and *Demon Seed's* Proteus-if actual (and here lies the big qualification)-would fulfill the empirical challenge. But with no such devices in the offing, we must leave off the empirical challenge and address the theoretical question. This requires some mental exertion since the empirical challenge is always easier to deal with than the theoretical question. The empirical challenge is utterly straightforward. Can we send a man to the moon? Well, try building a rocketship and sending a man to the moon. In the words of a popular advertisement-Just do it! But when we've racked our brains trying to solve a problem (in this case the problem of artificial intelligence), we eventually ask whether the problem has a solution at all. This is the theoretical question, and it is this question to which much of CMIM is directed.

Is it even possible/conceivable that computation encompasses intelligence? To my mind the very notion of possibility is problematic. In particular we must distinguish abstract from concrete possibility. To see what is at stake in this distinction, consider the following example. Is it possible to factor a given 1000 digit number into primes? An elementary theorem from number theory guarantees that any natural number has a (unique) prime factorization. Hence it is in principle possible to factor any 1000 digit number. But in practise this is beyond current computational resources. What's more, if factoring is "hard" in the sense of computational complexity, then given the resources available in the universe, there will be 1000 digit numbers we shall never be able to factor. Abstractly, it is possible to factor any natural number into primes. Concretely, the natural numbers we can factor is limited.

Is it possible for the computer to encompass intelligence? This is one formulation of the theoretical question. To explicate this question within CMIM, I had to do two things. First I had to argue that given the inherent finiteness of human behavior, some abstract computer can encompass human intelligence, if only by way of simulation. Such an abstract computer, however, sits in the abstract world of partial recursive functions, and is therefore only an abstract possibility. Hence, the second point that had to be addressed was whether a small enough machine can be built which incarnates this abstract machine into silicon and wire (actually, any physical medium will suffice), an actual machine which captures the full range of human intellectual functioning. Note that I always stressed this full range of intellectual functioning inasmuch as AI has made virtually no progress at this level.

Is such a machine a concrete possibility? This is a sticky question which to date remains unanswered. In the original version of CMIM submitted to *PSCS* I included about eight pages of material on computational complexity which address this question, but which were later deleted. The material was not only heavy going, but also inconclusive. Hans Moravec, for instance, offers estimates which indicate that such a machine is a concrete possibility. Yet the problems facing us are so daunting and our understanding of human intelligence is so incomplete that it is unclear whether a machine which captures human intelligent behavior (if only by simulation) is in fact physically realizable.

The obvious objection which the materialist will now raise is, "Just look at the brain, it's a physical system which captures intelligence. The complexity it evinces is large (10 billion neurons, 10 trillion synaptic interconnections), but not so large that it can't be realized via electronics." (At the time of this writing the word "tera" epitomizes the goal of supercomputer designers: they are after teraflop processors with RAM measured in terabytes; since tera = trillion, we appear to be getting close to the complexity of the brain. Such estimates are of course crude.) If materialism is correct, then Church's thesis guarantees that computers are the only game in town-intelligence will in this case have to be subsumed under computation. But what if materialism is wrong? What coherent alternatives do we have to materialism? Here we enter the realm of philosophy and theology.

As a scientific question it is an open problem whether computation can capture intelligence: theory to date neither excludes nor demands it; moreover, the empirical challenge is still before us (I never claimed otherwise in CMIM). Philosophical and theological considerations, however, may force us to take a stand. The materialist, I believe, must take his stand with the computer-notwithstanding the objections of humanists who decry the dehumanization fostered by equating man and machine. Moreover, the materialist will argue that alternatives to materialism inevitably introduce some sort of dualism that is incoherent. Thus materialism is supposed to provide the only bona fide intellectual position we can take. Philosophy must now examine the grounds and coherence of materialism itself as well as the constraints materialism places on cognitive science.

Philosophy's work is largely a matter of clarification. Two points in particular needed to be placed under philosophical scrutiny: the question of supervenience and the nature of reality. In CMIM I could not have defined supervenience more clearly, first in plain English and then in terms of higher order logic. NO DIFFERENCE WITHOUT A PHYSICAL DIFFERENCE. I was at pains to show that supervenience is not reductionism. I'm repeating myself because one of my critics clearly missed the point. When a materialist or physicalist claims that mind supervenes on brain he is saying that the brain fully determines the mind. If you will, the mind can do nothing without the brain's approval.

Now my point in CMIM was that the claim that mind supervenes on brain (which is the position of such diverse figures as Jerry Fodor, Willard Quine, and Donald MacKay) is not a substantive or empirical claim, but rather a bald assertion which rests solely on materialist presuppositions. Compare this to a reductive analysis which is not only substantive but also eliminative. If we have a reduction of mind to brain then we can dispense with mind and reconstruct it fully, if need be, from the brain. Supervenience, on the other hand, is reductionism without the reduction. It retains the spirit of reductionism without delivering the goods. Perhaps in principle there is a reduction, or in the mind of God there is a reduction, or if we had more paper that can be packed into the universe we could write down the reduction, but in fact no reduction is on hand. The only way empirically to establish supervenience is to write down a reduction (see CMIM, p. 214). Yet with the mind-body problem no such reduction is available.

The nature of reality cannot be avoided in the mind-body problem. By reality I mean the totality of what exists. Now for the materialist reality comprises the material universe—nothing more. For the Christian, however, reality comprises God and the creation, with the creation (alternatively world or cosmos) itself divided into spiritual and physical. There are two distinctions here: God vs. creation and spiritual vs. physical world. Now the first of these distinctions is robust. Indeed, God is fundamentally other than his creation. The distinction within creation, however, between spiritual and physical world is not robust. It was Descartes' great error to press the distinction between the physical and the spiritual so far that the physical world became autonomous. He did this by defining causality among physical things solely in terms of mechanism. Once this separation was in place, it proved impossible to rejoin physical and spiritual worlds into a coherent unity.

This proved especially bad for humans, who with a foot in both spiritual and physical worlds became irremediably fragmented. Such was the unavoidable consequence when Descartes sequestered the physical world into a strictly autonomous compartment. The classical Christian conception of reality not only allows God and the world to interact coherently, but also permits causal relationships within the world not limited to what Hume might call uniform natural causes. But you ask, how do the physical and the spiritual interact? If in asking this question you demand an explanation in terms of uniform natural causes, then you've decided the issue in advance. The question has no answer in the categories of natural science. Science can explain neither the Incarnation, nor the Resurrection, nor miracles generally. The Christian's reality is richer than the materialist's reality, but it is also a reality that contains mystery, a reality not transparent to scientific inquiry.

Western secularism is so set against what I've just written that I quote the following extended passage. Its content deviates slightly from our main topic, but its form is directly relevant. Writing against idealism and in favor of realism, Etienne Gilson observes:

Most people who say and think they are idealists would like, if they could, not to be, but believe that is impossible. They are told they will never get outside their thought and that a something beyond thought is unthinkable. *If they listen to this objection and look for an answer to it, they are lost from the start*, because all idealist objections to the realist position are formulated in idealist terms. So it is hardly surprising that the idealist always wins. His questions invariably imply an idealist solution to problems. The realist, therefore, when invited to take part in discussions on what is not his own ground, should first of all accustom himself to saying No, and not imagine himself in difficulties because he is unable to answer *questions which are in fact insoluble, but which for him do not arise*.

What I called the historic Christian position on mind and body in CMIM fits coherently within the historic Christian position on reality. The Christian runs into problems with these positions only when he, like Gilson's poor idealist, tries to answer the materialist in materialist terms.

The materialist asks us to pretend that God does not exist, that all miracles recorded throughout history (Christian as well as non-Christian) are bogus, that all religious experience is a projection of vain desires, etc., etc., and then to meet him in debate. This is not to deny that the Christian shouldn't engage the materialist on purely scientific questions where they are directly relevant to Christian faith. For instance, the empirical challenge of cognitive science still holds (I fully grant that my theology would crumble with

the advent of intelligent machines; yet without such machines on the horizon I feel secure in my "archaic" theology). On the other hand, we must bring the materialist to admit how impoverished his reality is and consequently how inadequate his understanding of the world is (e.g., a consistent materialist has nothing of substance to say about value or telos).

Finally we turn to theology. The key theological question for me is not a matter of dogmatic or systematic theology. The key question is a personal one and might even appear impudent. It is this: What must be true about myself and about God for me to want to worship him? To put it more crassly, What's so great about God that I should want to serve him? Why should I want to be with him in eternity? Whenever the torments of hell are described in lurid detail, we are apt to desire God simply to escape pain. Why should God let you into his heaven? is a question heard too frequently. Why should you want to go to heaven? is more directly relevant to our discussion. The answer, Because God is there, is void of content unless we know God. Let me stress that my question is not, Why should I serve God? but Why should I *want* to serve God? Fearful judgment is, I suppose, reason to serve God, but insufficient reason to serve God willingly.

Frankly, when I consider the way God is frequently portrayed, even in Christian circles widely regarded as non-heretical, I have no desire to spend eternity with him. One God in particular I have no desire to spend eternity with is the God of the semi-materialists (cf. CMIM, pp. 215-219). Let us recall Donald MacKay's recommendation to all good semi-materialists that they "not hunt for gaps in the scientific picture into which entities like 'the soul' might fit." For the purposes of this discussion, semi-materialists are those Christians who hold that mind supervenes on brain. Why is this bad? If God decides to create us as physical systems whose consciousness and intelligence flow strictly from the constitution and dynamics of those physical systems, what's wrong with that? Is our value diminished because semi-materialism deprives us of a spirit or soul (spirit and soul being conceived as aspects of our person whose ontology transcends the physical organism)?

To this last question I answer, Yes. Nevertheless, by diminished value I'm referring primarily to my own, personal valuations, not necessarily to God's. I know my mind and I know what I value. I frankly know very little of God's mind, and I'm loath to attribute valuations to God except in cases where the valuations I attribute to God are crucial to my valuation of God himself. If humans are no more than carbon-based machines (and here by machines I include any physical system of arbitrary complexity), if God loves and values such machines, if Christ died for such machines, so much the worse for God-I'll look for another religion. I cannot worship any old God and I cannot worship God while maintaining a warped view of myself. A great God can properly be worshipped only by a great creature. Machines are wholly inadequate for the task.

Now in CMIM (pp. 216-218) I formulate an argument which addresses these concerns. It is an a fortiori argument and it works as follows. First I argue that the motion of a single cube within a stationary box is uninteresting unless an intelligence guides the motion of that cube. Uninteresting to whom, you ask? Well, to me for one. An intelligence can use the cube's motion to communicate with me. Communication can be interesting or boring depending on the communicating intelligence, but if there is no intelligence guiding the cube's motion, then boredom is assured. Now I chose the cube-box setup because this physical system is so simple that to claim an intelligence guides the cube's motion requires we look beyond the physical system comprising the cube and box. Here we have the weaker premise of the a fortiori argument, namely that cube watching is boring unless an intelligence not strictly derivative from the physical system comprising cube and box guides the motion of the cube. You may question if I have adequately defined my terms. What do I mean by boring, interesting, or valuable? My usage is perfectly ordinary. I'm through with philosophical analysis. Henceforth, I'm examining a very personal theological question, theological in the truest sense of the word-talking with and about God. Do you grant my weaker premise? If so, we can continue. If not, I have no further argument-you will have to content yourself with my scientific and philosophical analyses.

What then is the conclusion which in true a fortiori fashion is supposed to follow resoundingly from the weaker premise? It is this: God finds even less interesting a physical world where all intelligence this world displays is strictly derivative from the physics of that world, than we do a cube-box system where the

cube's motion is guided only by whatever intelligence is already inherent in that cube-box system. Does this argument work? Does it accurately portray what is at stake in human and divine intelligence? Or does it turn on a fuzzy analogy, relating what's interesting to God with what's interesting to humans in the sense of a Freudian projection? The argument does indeed turn on an analogy. Nevertheless, if we mean anything in calling God omniscient, we must grant that God's knowledge of the physical states of the world (past, present, and future) is comprehensive and total. Since our knowledge of a cube's motion inside a box is incomplete, God understands the physics of the universe *better* than we understand the physics of any cube-box system. I'm bored with the physics of cube-box systems taken in isolation. By analogy I claim God is bored with the physics of the world when divorced from spiritual realities. Am I guilty of an egregious anthropomorphism, projecting human values onto a God who wants nothing to do with them, or am I simply as a creature created in God's image discovering a truth about myself (viz., boredom with physical objects taken in themselves-toys as I called them in CMIM) because this is a truth inherent in God (viz., boredom with finitary objects taken in themselves-in this case the physical world)?

If there is a problem, it turns on the type of God-talk we permit, i.e., the type of things we may legitimately attribute to God. Not only am I comfortable with the a fortiori argument I've made, but should I be convinced that such an argument, and more generally that such God-talk is nonsense, I would dispense with Christianity. Yes, God is transcendent and totally other, but he is also more and better. J. B. Phillips tells the following delightful story:

A simple psychological test was recently applied to a mixed group of older adolescents. They were asked to answer, without reflection, the question: "Do you think God understands radar?" In nearly every case the reply was "No," followed of course by a laugh, as the conscious mind realized the absurdity of the answer.

Why was their answer absurd? Obviously because God does understand radar. Moreover, he can convince us that he understands radar simply by writing out an explanation of radar on, say, stone tablets (he's been known to do such things in the past).

I have little use for the crude forms of apophatic theology which make the rounds in academia. Thus we are told that all human knowledge of God is strictly speaking impossible, or that to affirm anything about God is to define him and thereby deny him, or that anything we can say about God is at best loose metaphor and analogy, likely to be misleading if pressed too far. All such claims are positive, bold assertions about God and are therefore self-refuting. G. K. Chesterton saw this when he wrote, "We do not know enough about the unknown to know that it is unknowable." Church historian Jaroslav Pelikan indicates that Gregory Palamas understood it as well:

Apophatic theology did not negate or oppose positive knowledge, for what is said apophatically about God was true. The mistake of conventional apophatic theology, according to Palamas, was that it was not apophatic enough. It needed to recognize that God transcended not only affirmation, but also negation. Palamas attacked those whose preoccupation with the apophatic led them to deny any activity or any vision beyond it. If God transcended all knowledge, he transcended negative knowledge as well as positive knowledge.

This is an appropriate note on which to end.

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