

Free Will

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ABSTRACT: A criterion for the existence of human free will is specified: a human action is asserted to be a manifestations of human free-will if this action is a specific physical action that is experienced as being consciously chosen and willed to occur by a human agent, and is not determined within physical theory either in terms of the physically described aspects of nature or by any non-human agency. This criterion is tied to the structure of a physical theory. It is noted that the orthodox quantum mechanics that flows from John von Neumann's analysis of the process of measurement in quantum theory is described in terms of three processes that are effectively based on a three-level conception of reality. Von Neumann's "Process 2" is the deterministic evolution, via the Schroedinger equation, of a physically described aspect of reality, the quantum state. His "Process 1" is the physically described aspect of a psychophysical probing action whose psychologically described aspect is an increment in the knowledge of a probing agent/observer. Process 3, in Dirac's words, is "a choice on the part of nature" of the response to such a probing action. It is argued here that all three levels of this quantum structure, the physically described quantum state, the probing knowledge-acquiring agents, and the response-choosing nature, are all best conceived as idea-like in character. Quantum mechanics, though puzzling when viewed from the inappropriate perspective of the mechanistic classical physics, becomes rationally coherent when the underlying reality is conceived to be not a physically described classical monism, but rather an idea-based quantum triality. This idea-based conception of reality evades the pitfalls of non-physics-based idealism by being erected directly upon the basic concepts of pragmatic empirically validated quantum mechanics. However, the dynamical structure of quantum theory contains certain causal gaps. In particular, the process-1 agent-generated choices of probing actions are determined, within the theory, neither by the physically described aspects of nature, nor by any non-human agency. Thus, within the framework of orthodox quantum mechanics, the process-1 probing actions are, according to the specified criterion, manifestations of human free will, and they have, by virtue of the dynamical rules of quantum theory itself, the capacity to influence, in consciously intended ways, the physical actions of the agent. Thus the passage from classical mechanics to quantum mechanics converts human beings from mechanical automata to causally efficacious conscious agents whose conscious intentional efforts can, by virtue of the quantum laws themselves, cause to occur the intended physical action and increase in knowledge.

I. Criterion for Free Will.

What is “free will”? What does the term mean? What criterion can allow us to decide whether some human action is a manifestation of human free will?

Dictionaries define “free will” as “The power of choosing one’s own course of action”, or “voluntary or unhampered choice or decision.” But within the scientific framework provided by classical Newtonian-type physics these definitions are ambiguous with respect to the meaning of “one’s own” and “unhampered”. This is because human beings enter into scientific practice in two ways, which are described in two very different manners. The human experimenter is described both in physical terms, as the collection mathematically described properties attached to the space-time points that make up the evolving location of his physical body, which acts upon his physically described surroundings, and also in psychological terms. The latter aspects include his growing *knowledge*, which supplies the empirical foundation of science, and also his conscious decisions about how he will act, and moreover his experienced willful efforts to act in the way he has chosen.

Philosophers, speaking from a classical-physics perspective about the classical dualistic description of the human agent, often claim that the notion of conscious free will is an “illusion”. This claim arises because, according to classical physics, every action that an agent makes is completely determined by the physically described aspects of reality, which include the agent’s body and brain. This leaves the agent’s psychologically described aspect completely “hampered” by his physically described aspects, and bereft of any “power of choosing a course of action”. A human being’s psychological aspects are, within the framework of classical physics, completely “unfree”, because they are completely determined by the physical aspects of reality alone.

The point here is that the “will” referred to in “free will” is, from a common intuitive understanding of the words, essentially an idea-like reality. This “will”, in order to be “free” must, in the case of the “will” of some human being, be not fully determined by the physically described realities, either alone or in concert with any aspects of reality other than that human being’s own mental aspect. But this mental inner self, *according to the precepts of classical physics*, lacks the power to choose its own course of action, thereby rendering the person’s “free will” an illusion.

Being able to talk in these terms, and to determine on the basis of this criterion whether or not human beings have free will, presupposes both a general ontology in terms of which the concepts being employed are well defined, and a physical theory that specifies the causal connections in sufficient detail to resolve the issue.

II. Idea-Based Quantum Theory.

The present work is, conceptually, a continuation of my recent paper¹ “Quantum Mechanical Approach to the Connection Between Mind and Brain”. That work pursues the general theme of several earlier papers and books of mine, but goes significantly

beyond the others in two major ways. Like the earlier works it explains the important advantages of erecting our scientific understanding of the connection between mind and matter on empirically validated quantum mechanics, rather than on its empirically invalidated predecessor, classical mechanics. The most radical of the changes wrought by the switch from classical mechanics to quantum mechanics is precisely the injection of certain *choices*, expressed in terms of the psychologically described aspects of the experimenter/observers, into the dynamical laws of motion of the physically described aspects of nature. Conversely, classical mechanics is an approximation to quantum mechanics that *eliminates* precisely the element of freedom in quantum mechanics---namely the freedom conferred by the quantum uncertainty principle, which allows the psychologically described aspects of our conception of reality to causally affect the physically described aspects. I shall begin by reviewing the theoretical situation created by the switch from classical mechanics to its quantum successor, as elaborated by John von Neumann².

The connection of mind to matter specified by orthodox (von Neumann) quantum mechanics consists of two processes that act upon the physically described aspects of nature. The first of these is called “process 1” by von Neumann. It is a ‘local’ action, in the sense that it acts upon certain physical aspects of nature that are located in the body of a conscious agent, or in the region that can be reached from such a body by traveling no faster than the speed of light. It changes the physical state of the universe in a way that can be understood as posing a question whose ‘Yes’ answer, if received, would augment in a specified way the knowledge of the agent/observer. The second process is called by Dirac “a choice on the part of nature”. This choice determines the response to the question posed by the conscious agent. According to the precepts of relativistic quantum field theory^{3,4}, nature’s response acts globally: it acts not merely locally in the vicinity of the locally posed question, but, at the same instant “now”, also in far flung places^{3,4,5}.

The major innovation advanced in reference 1 is the notion that the connections between mind and matter are *limited* to precisely these two processes specified by quantum mechanics, namely “the agent’s process-1 choice of a probing action” and “nature’s process-3 response to such an action”. This restriction tightens the theory enormously by *excluding* the previously presumed direct action of the brain of an agent upon that agent’s conscious mind. The existence of such an action is problematic, logically, because the concept of the physical aspects of reality was specifically designed during the seventeenth century dawn of modern physics to contain no reference to the mental aspects. But how, then, can a physical motion of particles, described and conceived in a framework that is completely stripped of all connection to mental realities, suddenly produce (or become) a conscious thought?

This question would appear, as a matter of principle, to be devoid of a rational answer. And the failure of a 300-year intensive effort to discover such an answer supports the conclusion that none exists. But in that case the presently dominant “promissory materialism”, which is based on the promise that “someday” a classical understanding of the mind-brain connection will arise, is an entirely vain hope, and promissory materialism is fated never to redeem its promise.

In this situation the restriction of the mind-matter connection to the two actions *upon matter* specified by quantum mechanics provides two important services: 1) It specifies in some detail the form of this important connection; and 2) It frees the theory from an obligation that it can, as a matter of principle, never fulfill, namely the obligation to explain how a physical motion can produce, or become, a conscious thought.

III. Quantum Triality

The original Copenhagen quantum mechanics was presented to physicists as a practical mathematical procedure for computing, on the basis of knowledge gleaned from past experiences, expectations pertaining to the knowledge that might be acquired from future experiences. The theory was not put forth as an “ontology”. It was not offered as a description of a conception of reality itself. The student was advised not to get drawn into “metaphysical” questions pertaining to the nature of the reality that lies “behind” these rules. It was contended that “understanding quantum mechanics” consists of understanding how to use the rules to make practical testable predictions about how various observable systems will be observed to behave under empirically specified conditions.

In spite of this claim that quantum mechanics can be understood without needing to understand the reality lying behind the rules, these rules themselves naturally specify a conceptual structure that is effectively invoked when applying them. The conceptual structure involves three processes: a *physical* process, a *probing* process, and a *response* process. The ‘physical’ process is a process whereby the physically described state of a system evolves in a mathematically prescribed manner, except when an acquisition of knowledge occurs. Because the quantum state represents “our knowledge” (cf. Heisenberg⁶), this state must change abruptly with each acquisition of knowledge. There are, in quantum theory, two ways that our knowledge can change: (1), when an experimenter/observer experiences his act of choosing and performing a probing action; and (2), when the experimenter/observer experiences nature’s response to such a probing query/action.

Each probing action is a psychophysical event. This event links a possible acquisition of knowledge to a reduction, or collapse, to a new physical form of the state of the system being probed. The new state is the part of the prior state that is compatible with agent’s newly acquired knowledge. In this case of a probing action this new knowledge is the knowledge that he, the agent, has acted in a way that has put to nature the question that he has chosen.

Nature’s response is represented, in von Neumann’s (orthodox) formulation, as the psychophysical event of the agent/observer’s acquiring the knowledge of the answer to the query, coupled to the reduction/collapse of the physical state of the probed system to the physical state compatible with the acquired knowledge of the answer to the query.

Understanding these rules about how our human experiences are connected to the physically described aspects of nature, already involves a conceptual framework involving a three-leveled structure: 1), a bottom level consisting of the mathematically described quantum state of the universe; 2), a middle level consisting of enduring minds (of agent/observers) whose only specified capacities are to choose, and consciously intend to enact, specific probing actions, and then to experience the psychological aspects of nature's response; and, finally 3), a top level consisting of a 'nature' whose only specified role is to select and deliver responses to the agent-generated queries.

This conceptual framework involves three kinds of "realities": 1), the physically described quantum state; 2), the probing agent/observers; and 3), the responding 'nature'? But what are the ontological characters of these three putative "realities"?

The physically described quantum state is specified by ascribing mathematical properties to space-time points. This is the same kind of description that is used in classical mechanics to describe the evolving state of "matter". But the quantum state does not behave like the "matter" of classical physics. The quantum state represents "our knowledge", and it changes when "our knowledge" changes. According to Heisenberg⁷, it represents not only a compendium of existing knowledge, but also "objective tendencies" or "potentia" pertaining to future possible accretions to "our knowledge".

These features justify identifying the ontological character of the physically described quantum state as essentially *idea-like*: the quantum state behaves like an evolving *idea*, about future possibilities, that can abruptly change when a new experience occurs. But this "idea" is *objective* in the sense that it pertains to "*our* knowledge": the quantum rules are such that a collapse associated with any one agent's acquisition of knowledge of an outcome instantaneously (along the spacelike surface "now" in relativistic quantum field theory^{3,4,5}) affects the tendencies pertaining to the future experiences of *all* observers.

As regards the agent's choice of probing action, it is an important fact that this choice is not determined within the structure of contemporary quantum mechanics. Thus Bohr⁸ described this choice as "the free choice of experimental arrangement for which the mathematical structure of the quantum mechanical formalism offers the appropriate latitude." In actual practice this choice seems to come from "reasons": from the *reasons* that the experimenter chooses to perform this particular experiment rather than some other one. Thus as regards process 1, both the psychological and physical sides seem to have an ontological character that is *more idea-like than matter-like*.

As regards the ontological character of nature's choice of the outcome of the agent-chosen probing action, the standard position is that nature's choice is purely random. I find that position unacceptable: I consider it to be rationally incoherent for some definite choice to arise from nothing at all, completely "out of the blue". Rational coherence demands concordance with the principle of sufficient reason: every occurrence must, in a rationally coherent scheme, have some sufficient reason to be what it is. We should, I believe, strive for a science concordant with a rationally coherent understanding of the world.

This demand for rational coherence is easily reconciled with the empirically observed randomness. The argument is technical, so I shall be brief. Because volumes of phase space, and their quantum counterparts, [projection operators in conjunction with the “trace” operation that corresponds to the classical integration over all of the phase space], are invariant under both temporal evolution and all canonical changes of variables, any choice made for reasons that are unrelated to the specified probing action will appear to be random in exactly the way specified by the quantum probability rules. On the other hand, if the reasons for some particular ‘choice on the part of nature’ are closely connected to the choice of the associated probing action, then the quantum probability laws should fail in this instance. In short, the empirically observed quantum randomness arises automatically from a presumed normally large conceptual separation between the agent’s reason for his choice of probing action and nature’s largely inscrutable (to us) reason for its choice of response to that action.

Until and unless we can acquire some useful understanding of the “sufficient reasons” for nature’s choices to be what they are, the scientist is forced to use just the statistical predictions. Yet he need not be completely bewildered if strange coincidences seem to occur more often than would be expected on the basis of quantum randomness. He could rationally believe that the quantum randomness masks our failure to understand nature’s sufficient reasons, and could therefore endeavor to see if any useful regularities can be discerned in seeming violations of predictions based on the postulated pure randomness of nature’s choices. This perspective could conceivably eventually bear fruit more useful than what would come from an unshakable commitment to the notion that nature has the capacity to answer ‘Yes’ rather than ‘No’, or vice versa, without any reason whatsoever.

IV. The Intrusion of Reasons

Understanding the process that lies behind the choice of a process-1 probing action lies beyond the scope of von Neumann’s orthodox quantum mechanics. That formulation is simply a rigorous development of the original Copenhagen version, which was explicitly pragmatic, not ontological. Von Neumann’s analysis of the process of measurement extends the theory in the general direction of an ontology, but does not provide an ontology. It specifies two processes that intervene in the mathematically deterministic evolution of the physically described quantum state, but says nothing about how the agents, and nature, come to choose one action rather than another.

William James⁹ said, famously, that “thought is itself the thinker, and psychology need not look beyond.” But he said this in the restricted context of scientific psychology. As regards the issue of the *reason* why our thoughts are connected to brain-states in the way that they are, he averred that that reason “must lie where all real reasons lie, in the total sense and meaning of the world.” I take this to mean that a fundamental understanding of the mind-matter connection must be pursued, not by piecemeal tiny steps, but rather within the framework of a full-blown ontology. But before proceeding I would like to briefly recapitulate the basic features of the mind-based quantum ontology suggested by the foregoing considerations.

V. The Logical Structure of Quantum Mechanics.

Orthodox quantum mechanics has a natural three-level description. The three levels are:

- 1) A bottom-level physical description in terms of the evolving state (density matrix) of the universe.
- 2) A middle-level description in terms of individual minds, each of which can choose and activate the occurrence of process-1 knowledge-generating probing actions upon the bottom-level physical reality.
- 3) A top level “Nature”, which determines the responses, Yes or No, to the basically bivalent queries posed by the individual minds.

This three-level foundational structure is handed to us by quantum mechanics. But the nature and workings of the processes that govern the choices made by the individual minds, as well as the decisions made by “Nature”, are not spelled out by contemporary physical theory. We are given only a general framework, and thus still need to determine how the choices made by individual minds, and the decisions made by nature, are specified.

An essential point here is that the physically described world is not a *material* world. *Reality contains no “matter”*: no basic reality behaves like the material stuff of classical mechanics. The physically described world has the ontological character of a “continuous smear of potentialities”, which, even though it is represented in our basic theory---relativistic quantum field theory---by ascribing mathematical properties to space-time points, *behaves* more like *an idea* than like classically conceived matter. An individual “potentia” acts like an *objective idea* of a conceivable possibility of what might happen, combined with a statistical weight for the occurrence of that possibility.

Because the two lower levels are basically mind-like, it is not unreasonable to conjecture that nature’s choices, *which act globally*, arise from a foundation that also is essentially mind-like. This conjecture reduces the ontology to a three-tiered mentalist monism: to the conception of a mind-like quantum triality consisting of a globally acting ‘nature’, plus a plethora of ‘individual localized minds’ that act upon a ‘physical world’ of mathematically described *potentialities* for the occurrence of psychophysical collapse events.

This ontology stems naturally from an examination of the basic contemporary scientific laws of physics in the form of orthodox (von Neumann-Tomonaga-Schwinger) relativistic quantum field theory, stripped of all gratuitously added bottom-up dynamical actions in which the physically described aspects of nature act directly upon the stream’s of consciousness of probing agents. The apparent influence of a brain upon the associated mind is, according to this view, the response of the mind to the physical state of the brain that it is continuously probing.

VI. Comparison to the Ideas of Searle and Kim.

I have addressed the problem of “free will” in reference 10, and the present paper is essentially an elaboration upon that one. There I introduced the problem by referring to arguments given in recent books by two prominent physicalist philosophers, John Searle and Jaegwon Kim. To elucidate the significance of the quantum mechanical conception of reality described above I shall compare that idea to the ones proposed by Searle and by Kim.

Searle’s solution¹¹ of the problems of consciousness and free will has some important similarities to the one propounded above. Speaking of experiences Searle says (p.20) that “These data have a first-person status in that they only exist as experienced by a human or animal agent and consequently cannot be reduced to something that has a third-person ontology, such as behavior or brain states.” Later on (p. 32) he re-emphasizes this key point when he says that in his effort to place the problem of free will in a scientific setting “to my surprise, I found that I could not give a satisfactory account of decision making without presupposing the existence of the self.there are certain formal features of conscious decision making that force us to recognize that one and the same entity is conscious, rational, capable of reflection and capable of decision and action, and therefore of assuming responsibility.”

The essential point here is that Searle escapes reduction of the mental to the physical by introducing, in addition to the physically described realities *not simply conscious events, per se, but thinking agents*. This is precisely the answer given by quantum triality. Quantum mechanics gives not a dualism of ‘physical things’ and ‘mental things’, but rather a triality consisting of: (1), the physically described aspects of reality; (2), conscious agents that first choose a physical probing actions, then initiate it, and finally register the response to the chosen action; and (3), a ‘nature’ that determines these responses. The second aspect consists of precisely the “entities” that Searle demands.

But what is the nature of these ‘entities’? Searle suggests that the solution is now reduced to neurobiology. But that seems to bring back the rejected reduction to the physical. He says (p.31) : “We don’t know enough about how the brain works, specifically, how it produces consciousness, which it definitely does, and how it gives us the experience of free will, which it definitely does, to enable us to know how the experience of free will could be other than an illusion.” But how did Searle pass from the conclusion that there are conscious entities “capable of decision and action” to the conclusion that the physically described brain “produces consciousness”. The latter is bottom-up causation, whereas the conclusion that the conscious entities are “capable of decision and action”, suggests rather that the actions are top-down actions stemming most immediately from the conscious entity, or self, as specified by the quantum ontology.

Tracing back in Searle’s account one finds the reasons behind his bottom-up conclusion.. Searle accepts the “basic facts” uncovered by science. “We understand that the universe consists entirely of particles (or whatever entities the ultimately true physics arrives at)

...(p.4) and “The most important sets of basic facts, for our present purposes, are given in the atomic theory of matter and the evolutionary theory of biology.” He asks “How can we square this self-conception of ourselves as mindful, meaning-creating, free, rational, etc., agents with a universe that consists entirely of mindless, meaningless, unfree, nonrational, brute particles?” (p.5). The correct answer to Searle’s question is that physics no longer claims that the “universe consists entirely of” such brute particles, or even contains such things! Searle calls for the inclusion of “whatever entities the ultimately true physics arrives at”, but then fails to realize that physics has abolished the ‘brute particles’ that he is including, and has added---without their being included on his list of “entities the ultimately true physics arrives at”---the agents that he himself has proclaimed to be needed.

The quantum mechanical conception of the mind-brain connection being described here is the *causal reverse* of the bottom-up conception in which the brain “produces consciousness”. Quantum mechanics provides, instead, an understanding of how “conscious entities”, acting within the realm of freedom provided by the uncertainty principle, can influence, by their own decisions and follow-up probing actions, the course of the physically described aspects of a reality completely devoid of “un-influencible” brute material particles.

In his attempt to accommodate various possible physical theories Searle considers two alternative possibilities: Hypothesis 1 and Hypothesis 2. Hypothesis 1 is essentially the classical-physics-based idea in which the physically described reality is causally deterministic within the physical level. Hence, according to Hypothesis 1, our conscious intuition of being able to rationally choose between different courses of action, all of which are allowed by the physically described laws, is a complete illusion, because the course of physical events is, according to this hypothesis, completely determined by those physically described laws alone, without regard to any redundant, experienced mental process that leaves the deterministic bottom-level physical process completely undisturbed.

Hypothesis 2 is concordant with the quantum assertion that the physical level is not causally complete. However, Searle’s conception of the indeterminateness of the quantum dynamics does not include the physical indeterminateness of the crucially important process 1, but instead limits the indeterminateness of the physical theory to the “random” choices, which enter quantum mechanics only via *nature’s choices of responses* to the agent-generated process-1 probing actions. But in quantum mechanics the agent’s “free choices” are necessary precursors to nature’s “random choices”. By virtue of the uncertainty principle, these “free choices” are determined neither by the deterministic laws that are the quantum analogs of the deterministic laws of classical physics, nor by any other known laws or rules, statistical or otherwise. Searle’s analysis of the problem of free will is thus fundamentally flawed because it omits all consideration of these agent-based choices and actions that are precisely the places where the agent’s free will enters into the quantum dynamics.

The first two chapters of Kim's book¹² "Physicalism, or something near enough" give a rather detailed account of the problems besetting physicalism---the idea that the world is basically physical---in the classical-physics conception of the word. Chapter three, "The Rejection of Immaterial Minds", begins with a summary of the conclusions established in chapters 1 and 2, namely the usual quandary: "For the upshot of our considerations on mental causation was that, for the physicalist, there are only two options left: reductionism and epiphenomenalism. With good reason, most philosophers have found neither choice palatable. On the one hand, epiphenomenalism strikes most of us as obviously wrong...going against everything we believe about ourselves as agents and cognizers...[which] even if ...true could not serve as a guide to life...as a premise for practical reason...[or as something] possible for us to live as though it is true. Reductionism, on the other hand, has seemed to many people not much better: if minds turn out to be mere configurations of neurons, silicon chips, or whatever...that doesn't seem much like something we value ...something that makes us the creatures we are."

Thus Kim asks: "So why not look outside physicalism?" But that would mean "embracing an ontology that posits entities other than material substances." "I will argue that ontological dualism provides us with no help at all, and in fact makes things worse. My target will be the interactionist dualism of Descartes. I will be focusing on how mental causation fares within the Cartesian scheme. My conclusion will be: very badly."

What is the problem that Kim identifies?

Normally, *my* mind causally influences, directly, only *my* body: *my* mind and *my* body stand in a special causal relationship to each other. An ownership relationship exists. One possibility is to take this "unison" of a mind and a body into one person as an "unexplained and unexplainable primitive". (p.77) Kim says: "I find such an approach inadequate and unsatisfying. For it concedes that the notion of 'union' of a mind and a body, and hence the person is unintelligible. For what is it for an immaterial thing wholly outside space to be 'united' or 'joined' with a material body with a specific location in space? The word 'united' merely gives a name to a mystery rather than clarifying it... If...my mind and my body [are joined] to make a person, there must be a relationship R such that a mind stands in relation R to that body if and only if that mind and that body constitute a unitary person. ...Unless we know what R is ... the word "unison" remains a mere label..." These early parts of Kim's book describe, then, the problems.

The final section in Kim's chapter 1 has the title "The Two World-Knots". The two knots refer to the problems of consciousness and mental causation that he had explained earlier in the chapter. He says: "They are indeed *Weltknoten*, problems that have eluded our best philosophical efforts. They seem deeply entrenched in the way that we conceptualize the world and ourselves, and seem to arise from some of the fundamental assumptions that we hold about each." "Does this mean that there is some hidden flaw somewhere in our system of concepts and assumptions, and that we need to alter, in some basic way, our basic concepts in order to rid ourselves of these problems?" "Some philosophers would be willing to take this as a sufficient ground for urging us to abandon our present system of concepts in favor of a cleansed and tidier one, claiming that the conundrum of mental

causation and consciousness is reason enough for jettisoning our shared scheme of intentional and phenomenal idioms, with its alleged built-in ‘Cartesian’ errors and confusions.” “To motivate the discarding of a framework, we need independent reasons--we should be able to show it to be deficient, incomplete, or flawed in some independent way, independently of the fact that it generates puzzles and problems that we are unable to deal with.”

Of course, the independent reason does exist! The “built-in ‘Cartesian’ errors” arise from the fact that the putative physically described aspects of nature that Kim and other physicalists are considering are the physical aspects of Cartesian dualism and of Newtonian/Classical physics. But that conception has, for nearly a century, been known by physicists to be fundamentally incorrect! So the entire foundation of Kim’s conception of the problem is indeed “deficient, incomplete, and flawed” because that Cartesian conception cannot accommodate the empirical facts, and has been replaced by physicists with a fundamentally different conception in which the mental and physical aspects no longer occupy rationally disjoint realms. Due to the quantum uncertainty principle the physically described aspects are no longer dynamically complete! Additional processes are needed to complete the dynamics, and moreover to complete the dynamics in a way that accounts for the empirical data, which enters the ontology in the very special form of our conscious perceptions.

The relationship R between mind and matter is thus no longer just the name of a “mystery” of how two rationally unrelated realms are, mysteriously, aspects of a unified whole. In quantum mechanics the relationship R is an articulated relationship between aspects of a conception of nature in which the physically described aspect is no longer dynamically complete within itself, and is no longer conceptually self-sufficient, because, the physical state is, as a cause, merely an “objective tendency” for the occurrence of something beyond itself, namely the occurrence of increments of “knowledge”. There is a ‘second process’ that disrupts the deterministic evolution of the purely physical process and produces abrupt quantum jumps in the physical reality (state) that bring it into alignment with the associated increment in knowledge. The replacement, by physics, of the known-to-be-false Cartesian duality, with its two conceptually disjoint realms, by the fundamentally different quantum mechanics is certainly sufficient “To motivate the discarding of [the Cartesian] framework”. There is indeed a “flaw somewhere in our system of concepts and assumptions”, and that flaw is the acceptance of the precepts of a physical theory that is now known to be profoundly wrong, and profoundly wrong, above all else, precisely in its conception of the connection between the observer and the physically described system being observed.

Kim, after explaining the irresolvable difficulties with physicalism, the *Weltknoten*, goes on to claim that he can salvage something “near enough”. What he salvages is the causal effectiveness of the *functional aspect* of the conscious intention, but not the causal effectiveness of the phenomenal/experiential aspect of the conscious intention. But it is the causal effectiveness in the physically described world of the *experiential* aspect of one’s self--of one’s feelings of freely making a choice as to how one will behave, and then making the mental commitment and conscious effort to make that behavior happen--

- that has always been the problem. That long-standing problem is not resolved by Kim's solution, which is therefore not "near enough". In sharp contrast to quantum mechanics, it renders our conscious intentional efforts *themselves* causally inert in the physical world.

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