Presence and Reality: An Option to Specify Panpsychism ?

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Abstract

Panpsychism is the doctrine that mind is a fundamental feature of the world, existing throughout the universe. One problem with panpsychism is that it is a purely theoretical concept so far. For progress towards an operationalization of the idea, this paper suggests to make use of an ontological difference involved in the mind-matter distinction. The mode in which mental phenomena exist is called *presence*. The mode in which matter and radiation exist is called *reality*. Physical theory disregards presence in both the form of mental presence and the form of the temporal present. In contrast to mental presence, the temporal present is objective in the perspective of the third person. This relative kind of objectivity waits to be utilized for a hypothesis of how the mental and the physical are interrelated. In order to do so, this paper translates the mind-matter distinction into the distinction between mental and physical time and addresses the problem that panpsychism tries to attack head-on in these temporal terms. There are, in particular, two issues thus getting involved: (1) discussions about a time observable and (2) the quantum Zeno effect.

1. From the Presence of *Qualia* to the *Presence* of Qualia

The hard problem that the mind-matter distinction confronts us with is ontological:[1] How is it that the conscious mind exists ? The conscious mind, though correlated with material processes, does not exist in the mode the material brain does. The material brain is something real. It exists independently of appearing in experience. Conscious phenomena – think of sense-qualities, feelings, moods – exist only by way of appearing. The neural, chemical and electrical processes going on in the brain are part and parcel of physical reality. Qualia are not to be found in the reality that physical theory describes. In a sense, qualia exist in the way illusions

[1] Many of the arguments to follow remain valid if the mind-matter distinction is conceived epistemically, though. See, e.g., Franck and Atmanspacher (2008).

exist.[2] Illusions exist regarding the phenomenal content presented, they do not regard the reality represented. Correspondingly, qualia exist as actual appearances. They do not survive the actuality of the appearance, however. Presentational actuality, not physical reality is the mode in which conscious phenomena exist.[3]

Conventionally, these differing modes of existing are accounted for by a dualism of perspectives. Qualia appear in the perspective of the first person. The first test of whether what appears is real lies in replacing the perspective of the third person by the perspective of the first person. Remarkably though, this test does not sharply discriminate between reality and actuality. The third person perspective still involves experience and thus appearance. A way of distinguishing physical reality and presentational actuality in a more clear-cut way lies in utilizing the difference between physical time and tensed time.

Time, on the basic level of physics, is reversible and homogeneous. Tensed time, in contrast, is irreversible and contains the heterogeneous regions of past, present, and future. Physics disregards differences in actuality. Tensed time gives expression to the differences in actuality that we observe. According to the physical concept of time, the process we experience when having the impression that time goes by does not exist but by way of appearing.[4] By implication, tensed time finds itself deemed a quale.[5] By reducing time to physical time, i.e. by excluding the Now from the concept of time, the real is consistently purified from differences in actuality. In physical spacetime, states of the real coexist irrespective of the place in time where they are to be found. Accordingly, there are no three-dimensional bodies in spacetime, but only four-dimensional "trajectories" encompassing, without any discrimination regarding the mode of existing, the totality of the stages that the object runs trough during its lifetime.

[2]This does not mean, of course, that qualia and, thus, experience are illusions as such. It means, rather, that appearances are actualities in their own right. There are no illusions other than actual experiences that are of illusory content.

[3]As a mode of existing, presence implies a standpoint or point of view. To be present means to be there within a horizon. Because of its inherent indexicality, presence has not been among the modes of existing acknowledged by science and scientifically minded philosophy. Accordingly, phenomena that exist only in the mode of presentational actuality seem to have no place in a scientifically minded ontology.

[4]To cite a representative voice: "... the general view today of scientifically minded philosophers concerning the temporal passage is that it is a subjective illusion" (McCall 1994, p. 26).

[5]Relativity theory even explicitly denies that temporal change is physically objective. Relativity theory forbids universal simultaneity. In spacetime, the simultaneity surface of a point in time varies with the location of the observer. The actual time slice would thus be observer dependent. A mode of existing that is observer dependent cannot be acknowledged as physically objective. Accordingly, actuality, in contrast to physical reality, is deemed a non-objective mode of existing.

Insofar as non-objective means subjective, actuality is a subjective mode of existing. Actuality, however, is objective in the perspective of the third person. In contrast to sense-qualities, feelings, moods, tensed time is socially objective. People agree on the experience that time goes by, they even agree on the time slice of spacetime that happens to be the actual one. The question is thus where this social objectivity comes from. It is nonsense to assume that the synchronization of the experience we individually have of time can be brought about by way of a social convention. Hence, might it have been premature to dismiss actuality altogether from physical reality ? Would it not amount to a miracle if the agreement regarding the location of the present in time were without any physical cause ? Should we not, rather, assume that there are roots of the actual still to be found in the physical ?

Moreover, should we not even assume that the qualities actualized in experience have roots in physical reality still to be detected ? Even though conscious experience, as we know it, is a phenomenon that is supposed to have emerged in the course of biological evolution, experience is too peculiar a phenomenon for having emerged directly out of some material substrate. Does the very idea of emergence not presuppose that there is something closer to the experiential engrained in physical reality ?

This is the question that recently has lead to a revitalization of panpsychism (Skrbina 2005, Strawson 2006). Panpsychism postulates that something proto- or micro-experiential must be a universal if not ubiquitous feature of the universe. In a most recent formulation, put forward by Galen Strawson, the postulate reads as follows: Since experience is something that really exists, and since physical reality is all that really exists, physical reality must include experience in one way or another (cf. Strawson 2006). Looking for ways in which this postulation can be made operational, the social objectivity of actuality is a natural candidate. Regrettably, Strawson, as the debate in general,[6] disregards the issue of time. It is only implicitly, and in fact inadvertently, that actuality finds itself introduced (Strawson 2006, p. 8, italics added): "The physical ... includes everything that *concretely* exists in the universe."

Concreteness is a quality certainly not included by physics in the real. Concrete existence means actual existence. Concrete things are the objects that we perceive and deal with. Concrete things are three-dimensional sections out of four-dimensional trajectories. The cut that singles out each individual stage of an object that we perceive and can deal with is performed by the difference that actuality makes regarding the stages that the object runs through during its lifetime. It is only by selecting successively one of these stages after another – and making

[6] Grifin (1998) is a remarkable exception: Following Whitehead, Griffin connects experience to the duration of the actual entity. He does not go as far, however, as to connecting actuality to the perspective of the third person.

them to surface in the Now – that concrete things emerge. In the case that actuality is a subjective mode of existing, concreteness, too, is to be deemed a quale.

Strawson does not realize the opportunity he stumbles upon. Even though he mentions, in passing, that "everything that concretely exists is intrinsically experience-involving" (Strawson 2006, p. 8), he leaves the point aside as an uninteresting detail. He overlooks – as does the debate around panpsychism in general – that concreteness involves a mode of existing that is neither purely subjective nor purely objective. On the one hand, concreteness is a function of actuality. There are no concrete things lacking actuality. On the other hand, concreteness is a matter of degree. Concreteness varies with the intensity with which something is present. There is nothing more concrete than the things that captivate attention (see Franck 2004).

The mode of existing that varies with both the tenses of time and with the attention bestowed is *presence*. Presence, however, is the mode in which not only the objects of experience exist, but also the mind itself that is the subject of experience. The mode the conscious mind exists in is mental presence. If presence resists being reduced to a purely subjective mode of existing, it offers a way to be tried out for making the postulate of the proto-experiential operational.

2. Presence and Its Ways of Changing

Presence is the mode of existing that sentient beings cannot help being familiar with. Sentience as such means presence realizing itself. Sentience is either present or non-existent. If it exists, its way of existing implies an immediate awareness of its own. This immediate self-awareness does not imply a self, let alone a self conscious of itself. It may be as primitive as the *creature consciousness* that Chalmers (2000) suggests as the most primitive form of conscious experience conceivable. Creature consciousness amounts to nothing else than the coming forth of a sensation without any differentiation as to a self that is sensing and a content that is sensed. In creature consciousness, the sensation of what is present and the self-sensation of presence are one. Nevertheless sensation implies manifestation, i.e. cognizance. This cognizance, to repeat it, does not mean that there is a difference – and thus a relationship – between knower and known. The relationship may collapse into self-knowledge without a self. The presence of a sensation, how primitive and dim it may be, amounts to a feeling of *one's own being there*: a feeling of "one-self" as it is implied in the very meaning of "being conscious".

If physics is right, there is no presence to be detected independently of its manifestation in experience. Even intuitively, it is hard to see what

remains of presence when the manifestations of conscious experience are abstracted away. If, however, presence and the presence of experience are one and the same, *the temporal present finds itself fused with mental presence*. Considered from the viewpoint of creature consciousness, this fusion may seem unproblematic. Considered from the viewpoint of the experience that has realized the distinction, fusing mental presence with the temporal present means to fall back behind a crucial achievement of the self-knowledge of subjectivity.

The distinction between mental presence and the temporal present relies on drawing a line between one's own feeling to be mentally present and the awareness of phenomena presenting themselves. This latter distinction relies on realizing that there are, within mental presence, intensities that vary independently of one another. Phenomena presenting themselves come and go. Even though it takes a certain duration for the phenomenon presenting itself to become manifest, this duration is very small in comparison with the duration that mental presence needs in order to come to itself. There is no feeling of one's own presence if the intervals during which the presence lasts are too short.

As soon as the distinction is drawn between one's own presence and the phenomena presenting themselves, another distinction can be drawn. The *intensity* with which phenomena are present can change two different ways. There is a way that is susceptible to being *controlled* and a way that is plainly *autonomous*.

The feeling of being capable to control the intensity with which phenomena are present is the feeling of controlling the focus of one's *attention*. The presence of phenomena is made to change when attention switches between background and foreground. Switching between background and foreground involves a feeling of *agency*. Agency, like sentience, implies immediate self-awareness. In contrast to sentience, however, the feeling of agency is a feeling also of resistance. Accordingly, the feeling of controlling the process of "presentification" never is without limits. Rather, the feeling of controlling the focus correlates with the awareness that there is an autonomous change in the presence granted to phenomena. Without any attentional effort, the presence of phenomena changes in a constant, regular and irreversible way. Expectations turn into perceptions, perceptions vanish and get lost if not re-presented in the mode of recollection. This autonomous process of reshuffling presence is as objective as a process can be. It is the process that the subject experiencing it will call the *passage of time* once the conceptual means for doing so are available.

Manipulating the presence of phenomena in a controlled way lies at the heart of whatever mental activity. Thinking starts with selectively activating or suppressing the presence of phenomena. Disciplined control over the focus of attention is called concentration. When concentrating attention intentionally, the feeling of agency assumes the feeling of ex-

ercizing effort. The effort needed to control the presence of phenomena gives rise to the awareness of yet another way in which presence changes. The presence of phenomena varies in the daily cycle of waking, getting tired and sleeping and is called *vigilance*. It varies, that is, with the *intensity with which we are mentally present*. This change of intensity is highly, though not completely autonomous. Vigilance can be influenced by, e.g., changing the environment or using psychoactive drugs. In comparison with controlling the focus of attention it proves notoriously hard, however, to control the intensity with which we are mentally present.

3. Focal Change, Changing Vigilance, and Temporal Change

From within mental presence, three kinds in which presence changes are thus to be distinguished: focal change, changing vigilance and temporal change. From an external physical point of view, each of these changes is subjective. Interestingly, though, the change that seems to be most objective from within mental presence seems to be most spontaneous from the physical point of view. So far, no physical force or mechanism whatsoever could be detected that is responsible for the passage of time. Temporal change, so it seems, is *spontaneous*: a change without physical cause.

The daily cycle of wakefulness and sleep feels like the rising and falling of an energy level. Most probably, there is a corresponding cyclic change of physical energy.[7] It is far from clear, however, how the level of physical energy relates to the intensity of presence as it is felt subjectively. What seems to be clear in principle is how focal change is related to physical processes in the brain. Even here, the easiness with which focal change is controlled corresponds, however, to the intensity with which we are mentally present. Control comes to an end when we fall asleep. In dreaming the distinction between focal change and temporal change is lost.[8]

Even in daydreaming the difference between focal change and temporal change is blurred. The distinction is recovered when the feeling of being in control of the phenomena presenting themselves returns. Feeling to be in control of the presence of phenomena does not mean, however, to

[7] For a review see Maquet (2000), see further Czisch *et al.* (2004).

[8] There may be an exception to this rule: the phenomenon of lucid dreaming. "In lucid dream ... the ego is aware that the experience is a dream. This allows the ego much more freedom of choice and creative responsibility to find the best way to act in the dream" (LaBerge and Rheingold 1990, p. 31). Lucid dreaming is a capability, however, that depends on exercizing concentration in the wake state. It depends on the kind of exercize that the freedom of will may generally depend on. Willing is inseparable from concentration. By concentrating on the object intended we perform a kind of self-conditioning that may become effective later on. In lucid dreaming this self-conditioning becomes effective in the dream state.

feel like a "prime mover". The feeling is rather that of intervening in an otherwise autonomous process. The degree to which the phenomena presenting themselves are present changes all by itself. There is a constant and relentless reshuffling of presence going on.

The feeling of being in control of the focus of attention is, to put it metaphorically, the impression of navigating the river of time. The interventions we find ourselves allowed to are narrowly circumscribed. Nevertheless, it seems possible to interrupt momentarily the autonomous reshuffling of presence by focussing attention on a particular feature of a phenomenon presenting itself. It seems possible, in particular, to keep aspects in the foreground of attention longer than they would present themselves without intentional control. By keeping aspects intentionally in the foreground that would otherwise recede into the background we find ourselves intervening in a process whose autonomy can thus be utilized operationally.

4. Inherent Instability and Changing Intensity

Presence, as a mode of existing, differs fundamentally in two respects from physical reality. First, presence is inherently *transient*. Even when persisting, presence implies constant change of what presents itself. Reality, in contrast, implies constancy of what exists. Regarding physical reality, everything that exists once is existent once and forever. Regarding presences, everything that became present is doomed to vanish into the past. Second, presence is not an either-or mode of existing – it is a *matter of degree*. In reality, everything that possibly exists is either fully existent or not existent at all. In actuality, something can be fully present or present only to a limited degree. Reality is a mode of existing free of gradation. Presence is a mode of varying intensity.

Both the transience implied in presence and its varying intensity pose problems when it comes to conceptualization. Until today, no consistent and comprehensive account of the mode in which conscious phenomena exist is available.[9] Until today, not even a consistent description of the process that we perceive as time is available.[10] The problems of conceptualization begin with drawing a sharp line between real change and temporal change. Real change means that world states differing in date also differ in structure or function. Temporal change means that states having been future become present, only to vanish into the past.

In experience, real change and temporal change are intimately intertwined. The distinction is simple where changes in presence are without

[9] A very detailed and careful characterization of eleven basic defining constraints for phenomenal consciousness is due to Metzinger (2003, Chap. 3.2).

[10] McTaggart's (1908) claim of a century ago concerning the "unreality of time" still awaits conclusive refutation.

imprint in physical reality. In relativity theory, presence is disregarded while spacetime is perfectly left intact. But what happens when attention switches between background and foreground? By this switch, nothing but the intensity of the phenomena presented needs to change. Nevertheless, does the switch not involve neural processes that are real? To what extent is the change in presence spontaneous, i.e. due to temporal change? To what extent is it physical, i.e. caused by neural processes? Notice that the distinction between focal change and temporal change is a distinction drawn from within mental presence with the help of the feeling of being free to change the focus of attention intentionally.

The problems of conceptualization continue when it comes to the description of the Now. In order to demarcate the border between future and past sharply, the Now would have to be point-like. If the Now is extended in time it encompasses parts that are earlier and parts that are later. Accordingly, it would be possible to distinguish, within the Now, between past, present and future. A Now falling apart into past, present and future cannot possibly be a Now. Conversely, a Now that is point-like cannot be a Now either. A Now that is point-like would not be consciously accessible.

In fact, the Now, as we know it, is not a razor's edge, but a "specious present". It is extended on various levels of *eigentimes*, ranging from some 10 milliseconds to some seconds.[11] These eigentimes can be measured by making use of both clock time and subjective reports by test persons. Measured in clock time, the specious present appears both to be extended over some seconds and to last forever at the same time.

The Now, when measured in eigentimes, appears as a series of momentary nows. The Now, when looked at from within, is a persisting Now. For a sentient being, it is always Now. Considered from within, the Now is even indistinguishable from mental presence. It is mental presence that remains present when the phenomena presenting themselves are passing. Hence, what remains of the Now when mental presence is interrupted?

If mental presence and the persisting Now amount to one and the same, time's flow should be interrupted when mental presence is interrupted. Still, time's flow is going on – irrespective of the ups and downs of mental presence. Mental presence dies when we fall into dreamless sleep. It is reborn when we wake up. The temporal present is moving on whether or not the individual brain is in the state of mental presence. Each moment, another time slice of spacetime is surfacing in the present. Subjects agree on the time slice presenting itself as the Now. Hence, there should be something beyond the individual brain that synchronizes the experience that we individually have of time.

[11] For an overview of corresponding research in psychology and cognitive neuroscience and its results see Atmanspacher and Filk (2003).

5. Presence and Manifestation

From within mental presence, the daily cycle of wakefulness, fatigue, dream sleep and dreamless sleep appears as a cycling between concentration and relaxation. When wide-awake, presence tends to be highly concentrated or is easily made to concentrate. When getting tired, the concentration of presence and its capability to control itself decline. When dreaming, control is lost. In dreamless sleep and in coma, concentration has fallen below the level at which presence can come to itself. When consciousness is lost, the immediate self-awareness implied in mental presence is lost.

We do not know how presence enters the state of immediate self-awareness. We only know that it is immediate self-awareness that lies at the base of mental presence. Moreover, we know that the capability of referring to oneself lies at the basis of both the manifestation of conscious experience and the agency of subjects. When the capability of self-reference is lost, mental presence degenerates into the *potential* to manifest itself. This potential is on the move when time goes on independently of mental presence. *Instead of mental presence, it is then the temporal present that moves* along the axis of time.

Thus distinguished from mental presence, the temporal present itself relies on an uneven distribution of presence in spacetime. It results from a condensation of the potential to become manifest in a certain "simultaneity membrane" of spacetime. The inherent transience of presence means that this membrane is not standing still but moving through spacetime along a dimension which, in turn, is thus selected as the axis of time.

Since there seems to be no detection of presence apart from mental presence, and since mental presence is the distinguishing feature of sentient beings, the *capability* of amplifying presence up to the level of manifest consciousness seems to be one of the distinguishing features of living matter.[12] This conjecture, to be sure, relies on the actual detection of presence, i.e. on the existence of phenomenal states that are actually – i.e. reflectively – assured of themselves. A distinguishing feature of life may thus be detectable by understanding how nervous systems eventually engender phenomenal states.

This understanding, however, is not restricted to the working of the neural machinery. Presence, conceived as the potential to manifest itself, is assumed as a fundamental if not ubiquitous feature of the universe. A way of looking for signs of this basic feature would be to look for possibilities of accounting for temporal change from within physical theory. The detection of temporal change is restricted, to be sure, to states engendered by individual brains. Nevertheless, the detection of temporal change im-

[12]The details of this process of amplification across levels are certainly very subtle and intricate, and cannot be addressed in the framework of this paper.

plies the detection that the experience undergone by the individual brain is synchronized intersubjectively. Let us conjecture, thus, that there must be something like an interface that connects the tensed domain with the tenseless domain of time which physical theory is about.

6. Are There Seeds of Tensed Time to Be Identified in Physical Reality ?

Looking for possibilities of accounting for the synchronization of the experience we individually have of time, *entanglement* comes to mind – those long-range correlations once labelled (disbelievingly) by Einstein as "spooky actions at a distance". The correlations that entangled states exhibit prevent these states from being localized unequivocally in space. Entangled states are synchronized holistically in a way that is reminiscent of what Leibniz once called "pre-established harmony".

Pre-established harmony is the metaphysical device that Leibniz invented for showing how it is possible that the experience of individual souls, i.e. of monads, is synchronized interindividually even though the ("window-less") monads do not interact with each other, and even though there is no direct interaction between the mental and the material. Pre-established harmony means that the mental domain and the material domain have been synchronized from the very beginning of the universe "with so much art and accuracy that we might be assured of their future accordance".[13] According to Leibniz, the magnificent watchmaker accomplishing this synchronization is God. The question thus is whether quantum theory affords the means for translating the metaphysical concept of pre-established harmony into a physical concept of holistic synchronization.

In an explorative study, Hans Primas (2003) addressed this question in detail. In order to do so, he conceived, in the language of algebraic quantum theory, an *unus mundus*, i.e. a world that encompasses, in initial unification, both reality and presence.[14] Presence, thus conceived, is a potential that waits to be included into the basic features of the universe. In Primas' (2003) words:

> Our point of departure is the hypothesis that there is a timeless holistic reality which can be described in terms of the non-Boolean

[13] Cf. "a letter of Leibniz on his philosophical hypothesis and the curious problem proposed by his friends to the mathematicians" (1696). Quoted from Leibniz (1890), No. XV, pp. 92–93.

[14] The idea of an *unus mundus*, as addressed by Primas, goes back to Wolfgang Pauli who, in turn, took it from C.G. Jung's depth psychology; see Atmanspacher and Primas (2006). The idea is that of a primordial unity of the mental and the material that mind and matter are epistemically different aspects of.

> logical structure of modern quantum theory. Neither time, nor mind, nor matter and energy are taken to be a priori concepts. Rather, it is assumed that these concepts emerge by a contextual breaking of the holistic symmetry of the *unus mundus*.

Primas goes on to demonstrate that and how it is possible to obtain both a tensed and a tenselss domain by breaking the primordial symmetry. The tensed and the tenseless domain can be referred to with complementary non-Boolean descriptions which, in turn, can be combined into a single non-Boolean description. In this encompassing description, tensed time and tenselss time are synchronized by holistic correlations.

An account of tensed time in terms of algebraic quantum theory is considerably more than panpsychism in any of its formulations has offered so far. Including tensed time means to account for the temporal present. The temporal present is a preliminary stage of mental presence. The *unus mundus*, accordingly, is an account of the proto-experiential. Might it thus be that looking for roots of the experiential by way of presence in physical reality is not as hopeless as introducing the proto-experiential *ex ante* and *ad hoc*?

The temporal present, when conceived as the actual time slice of space-time, cuts three-dimensional objects out of four-dimensional trajectories. The temporal present, when conceived as the tensed domain of the *unus mundus*, is the location where macroscopic objects are constituted that are separated from both their spatial and their temporal environment. This is what the measurement process, as understood quantum theoretically, amounts to.

Measurement, thus understood, means that non-local correlations are suppressed to the effect that local facts emerge. Remarkably, this suppression is not an instantaneous "collapse" of the state vector, but a transition from entangled states to disjoint states that itself takes time. From within this *transient event*, it makes no sense to distinguish temporal parts that are earlier or later since there are no facts yet to be ordered sequentially. Considered externally, however, the event extends over a time interval that can be measured and subdivided.

The properties of the measuring event resemble those of the temporal present. As we have seen, the temporal present cannot be assumed to be point-like without incurring question-begging consequences. The present has to be extended somehow, thus raising the problem that it consists of parts which are earlier and later. When looked at from within, the "specious present" appears as an eigentime that resists being subdivided into parts. When measured from outside, it covers an interval that can be subdivided as long as its diameter is positive. Might it be that this conformity with quantum measurement is more than just by chance?

The time covered by the transition from propensity to fact is different

from the parameter time used to order facts. In the formulation of the measurement process by Lockhart and Misra (1986, pp. 71ff), an eigentime of the event stretching over a finite interval Δt, when measured externally, is expressed by a time operator – or time observable – T. (More precisely, the number Δt is regarded as the eigenvalue of an action performed by T.) The action of the operator T involves a *non-locality in time* that is indeed strongly reminiscent of the extended present. The operator T "operationalizes (externally) the size of the time interval over which temporal nonlocality persists (internally)".[15]

The introduction of the time operator must not be confused with the involvement of an observer that is mentally present. Rather, the temporal present is thus explicitly distinguished from mental presence. The introduction of the time operator means, to be specific, that two basically different aspects of time are distinguished. One of them parametrizes time as the temporal succession of sequential facts that have been constituted by measurement. The other is more fundamental as it refers to the emergence of facts. Facts are interpreted as traces of measuring events taking place in an extended present.

The extended present, thus conceived, is what remains of presence when mental presence has gone. Without mental presence, there is no self-realization of presence and thus no manifestation of facts. Mental presence, however, is not all there is regarding manifestation. In the transition from entangled to disjoint states the potential to become manifest is growing. There is no perception of non-local states. What we are presented with when we perceive the reality out there are disjoint states, localized in space and singled out in time. The reality described by quantum wavefunctions is not of this kind. It takes the measurement process for transforming holistically entangled quantum states into manifestations as concrete states of affairs.

What grows in the time that it takes to perform a measurement is the distinctiveness of potential states, one of which eventually will turn into a fact. This growth in distinctiveness differs fundamentally from the change that the sequential order of measured states gives expression to, i.e. real change. The growth of distinctiveness is much more of the kind that philosophical tradition has called temporal becoming.

Temporal becoming, as traditionally understood, means the ongoing and autonomous surfacing of world states in mental presence. If, however, there are forms – or proto-forms – of presence below the level of mental

[15]The citation is from unpublished notes on Lockhart's and Misra's paper by Harald Atmanspacher and Albrecht von Müller. These notes highlight the different aspects of time, whereas the paper by Lockhart and Misra (1986) itself deals with them in rather passing remarks on pp. 73f. Though unpublished, I cite these notes for reasons of acknowledgement because they elucidated the significance of Lockhart's and Misra's work to me.

presence, temporal becoming would not be restricted to conscious experience. Rather, the emergence of facts, as attributed to the process of measurement, would be a proto-form of temporal becoming. The fundamental difference between the measurement process and processes of real change would be that measurement involves the amplification of presence.

7. Agency and the Quantum Zeno Effect

The interpretation of measurement as proto-presentification is highly speculative. Let me make clear that it is neither fully endorsed by Primas nor by Lockhart and Misra. Nevertheless, these authors refer to forms of presence below the level of creature consciousness. They offer physical descriptions of phenomena that involve differences in presence. These differences, to be sure, only concern the potential to become manifest, not already the manifestation in conscious experience itself. The descriptions stop short of the immediate self-awareness by virtue of which presentification turns into manifestation.

In contrast to phenomena such as synchronization and temporal nonlocality, the phenomenon of time's flow involves manifestation. The impression that time flows does not come forth before the change in presence that is due to the moving focus of attention is told apart from the autonomous change of the place in time where the potential to become manifest is concentrated. Two conditions have to be met to distinguish these kinds of change. First, the individual nows corresponding to the eigentimes of the present have to be integrated into one overarching persisting Now. Without the reference point of a persisting Now there is no impression of passage. Second, the changes that are due to the motion of the focus have to be singled out according to the feeling of agency. Both the integration of the discrete moments of nowness into a persisting Now and the feeling of agency rely on the self-identification of presence.

The self-identification that is effective in the persisting Now and in the feeling of agency provides differentiated forms of the immediate self-awareness implied in the meaning of being conscious. The persisting Now in relation to which the phenomena presenting themselves are passing presupposes recollection, i.e. the identification of states re-presented as earlier states of the very same presence now performing the re-presentation (by controlling its focus). The feeling of controlling the focus of one's attention presupposes that the mental presence that focuses itself also identifies itself as a self whose presence varies independently of the presence of the phenomena presented (or re- or pre-presented, respectively). The forms of presence that are thus differentiated by way of self-identification are fundamentally different from the forms of presence below the level of manifestation.

Nevertheless, even these higher forms of presence might have roots in the forms of presence below the level of manifestation. Recollection, i.e. the imprint, conservation, retrieval and re-presentation of the content of experiences undergone, may rely on quantum processes that involve measurement in their own turn (see Vitiello 2001). Even the distinction between immediate perception and reproductive recollection may not only have to do with the differing source of input, but also with the differing intensity that the presence of the content assumes (see Franck 2004). Even the feeling of agency may rely on quantum processes that involve measurement.

The feeling of agency has to do with proprioperception. It is the feeling of one's own effort and of the effect of the effort one feels exercized. Proprioperception is well studied in terms of perception and sensomotorics. As intensively, however, as proprioperception is investigated in the context of gathering and processing sensory input, as rare is systematic research in the context of attention.[16] Paying attention means to control, to a noticeable extent, the ongoing process of manifestation. In order to feel oneself controlling one's attention, aspects of the "stream of consciousness" must be correlated with the effort one exercizes. Since the reshuffling of presence is autonomously going on, controlling the focus means to intervene into – if not to partially halt – the ongoing process of presentification.

In a neuroscience that is committed to the paradigms of classical physics, such intervention has no place. In this context, the impression of being free to intervene can only be an illusion. In a quantum theory of the brain, things may be different. Quantum theory includes the role that processes of observation play in gathering information. Gathering information from experimentation assumes that the experimenter asks questions that nature is supposed to answer. If this is to be a sensible undertaking, the experimenter must be free to manipulate initial conditions in a way that is not predetermined by the theory under test. For instance, such a lack of predetermination can be seen in Heisenberg's uncertainties. It is only the asking of questions – not the responses – where experimenters need to be free. By asking questions, i.e. by choosing initial conditions, the properties are pre-selected that are supposed to either become manifest ("Yes" response) or not ("No" response).

Choosing initial conditions makes no sense if it does not connect to a feeling of agency. In a study exploring the possibility of accounting for this freedom of choice within quantum theory, Henry Stapp (2005) goes into the question of how agency might work in connection with measurement. He recurs to the "quantum Zeno effect" first described by Misra

[16] In Pashler (1998), a standard reference for the psychology of attention, proprioperception is no indexed keyword.

and Sudarshan (1977): A rapid enough sequence of successive monitoring events can cause an otherwise unstable state of the system being observed to "freeze". By increasing the rate of measurements intentionally, Stapp sees a possibility of intervening into the flow of phenomena manifesting themselves. In particular, he sees the possibility that the brain increases the rate of measurements initiated when the answer obtained motivates the continuation of monitoring events (Stapp 2005, p. 51):

> If a "Yes" response occurs and includes a positive evaluative element that instigates a quick re-posing of the query then the quantum Zeno effect can convert this positive evaluation into positive action. Such a use by nature of the quantum Zeno effect would promote the survival of any species that can exploit it. Thus the physical efficacy of conscious effort entailed by this quantum model would provide a naturalistic explanation of how and why our brains developed in a way that can exploit the quantum Zeno effect.

The quantum Zeno effect, if capable of being induced by the brain, could amount to an intervention into the autonomous flow of events. The initiative would be not on the level of facts, but on the level of measuring events. It would only be the asking – not the answering – of questions that is influenced by the effort. Nevertheless, the effort would result in a remarkable effect. By speeding up the succession of monitoring events, the phenomenon focused at could be "frozen" transitorily. This would be enough for intervening into the process of presentification.

Stapp conjectures that intentionally inducing the quantum Zeno effect may be sufficient for triggering templates of mental action that eventually will have effects on the level of facts. Indeed, it is only by virtue of real effects that the capabilities provided by the quantum Zeno effect could have been detected by natural selection. Let us put aside the question of how an initiative that is not predetermined connects to an effect that is linked to a causal chain of facts. Irrespective of the question what freedom of choice means in the last analysis, the quantum Zeno might be the key to understanding where the intuitively compelling impression of being in control of one's focus stems from. Accordingly, vigilance may then be another expression for the capability of speeding up the succession of measuring events in the brain. The intensity with which we are mentally present may be the "how it feels" quality of maintaining the rapid succession of measuring events to the effect that the focus of one's attention is controlled. Dreaming and daydreaming would then result from the Zeno effect becoming too weak to be effective.

8. Conclusions

Due to the mode in which phenomenal states exist, the manifestation of conscious experience is a matter of degree. As there are levels of mental

presence above the level of creature consciousness, there may be levels below the threshold of self-awareness. The amplification of presence above the level of creature consciousness is what living matter is capable of. It is what happened in biological evolution, and it is what happens in the daily cycle of sleep and wakefulness. Regrettably, very little is known about how the amplification is accomplished.

The question, however, is a thoroughly empirical one. Even though we know of no way to measure the intensity of presence independently of mental presence, it would be rather arbitrary to assume that there are no levels of presence below the threshold of self-awareness. From the observation that the temporal present is on the move independently of mental presence, we are lead to suspect that there are levels of presence below the intensity needed for manifestations of subjective experience.

The temporal present is not only characterized by the local peak of presence and the spontaneous movement thereof, but also by the temporal non-locality that is maintained while moving. It is again an empirical question how this non-locality is related to the intensity of presence.[17] Moreover, the question of how the non-locality of the temporal present is related to the internal time that quantum theory attributes to the process of measuring is a question that waits to be operationalized empirically. The problem of this operationalization is, of course, that the temporal present cannot be distanced from the situation of experimentation.

Looking, thus, at the mode in which conscious experience exists, the question of how phenomenal consciousness has emerged from physical reality loses its purely speculative character. Presence, to be sure, is a mode of existing that physical science refrains from dealing with. Presence, however, is inevitably involved when the existence of conscious experience is addressed. Presence, moreover, is inevitably involved when the difference between physical time and tensed time is at issue. Even if mainstream scientific thought were right in denying the reality of the Now, our living in the Now and the passage of time are "illusions" that nobody has succeeded to get rid of so far. If temporal change is an illusion, it is an illusion that mankind is subject to collectively. The making of such an illusion is of prime scientific interest. It is of interest all the more as it promises to hide the key to an explanation of how conscious experience has come into the world.

Acknowledgments

One of the arguments put forward in this paper relies on work that was only indirectly made accessible to me: the internal time Δt of the

[17] This holds true for the levels above and below creature consciousness. For the levels above see Atmanspacher *et al.* (2007) and Franck and Atmanspacher (2008).

measuring event, originally presented in the paper by Lockhart and Misra in 1986. I learned of the paper and about its meaning through privately communicated notes by Harald Atmanspacher and Albrecht von Müller (see footnote 16). I gratefully acknowledge the tremendous help thus being granted. Since the notes are not published, the authors are free of any responsibility for the errors and misinterpretations to be found in the present paper. Thanks also to Walter Freeman for helpful hints to the correlation of physical energy levels in the brain and the subjectively felt intensity of mental presence.

References

Atmanspacher H., Bach M., Filk T., Kornwachs J., and Römer H. (2007): Cognitive time scales in a Necker-Zeno model for bistable perception. *Journal of Integrative Neuroscience*, ...

Atmanspacher H. and Filk T. (2003): Discrimination and sequentialization of events in perception. In *The Nature of Time: Geometry, Physics and Perception*, ed. by R. Buccheri, M. Saniga, and W. M. Stuckey, Kluwer, Dordrecht, pp. 67–75.

Atmanspacher H. and Primas H. (2006): Pauli's ideas on mind and matter in the context of contemporary science. *Journal of Consciousness Studies* **13**(3), 5–50.

Chalmers D.J. (2000): What is a neural correlate of consciousness? In *Neural Correlates of Consciousness*, ed. by T. Metzinger, MIT Press, Cambridge, pp. 17–39.

Czisch M., Wehrle R., Kaufmann C., Wetter T.C., Holsboer F., Pollmächer T., and Auer D.P. (2004): Functional MRI during sleep: BOLD signal decreases and their electrophysiological correlates. *European Journal of Neuroscience* **20**, 566–274.

Franck G. (2003): How time passes. On conceiving time as a process. In *The Nature of Time: Geometry, Physics and Perception*, ed. by R. Buccheri, M. Saniga, and W. M. Stuckey, Kluwer, Dordrecht, pp. 91–103.

Franck G. (2004): Mental presence and the temporal present. In *Brain and Being*, ed. by G.G. Globus, K.H. Pribram, and G. Vitiello, Benjamins, Amsterdam, pp. 47-68.

Franck G. and Atmanspacher H. (2008): A proposed relation between intensity of presence and duration of nowness. In ..... *Wolfgang Pauli's Philosophical Ideas and Contemporary Science*, ed. by H. Atmanspacher and H. Primas, Springer, Berlin, in press.

Griffin D.R. (1998): *Unsnarling the World-Knot. Consciousness, Freedom and the Mind-Body Problem*, University of California Press, Berkley.

LaBerge S. and Rheingold H. (1990): *The World of Lucid Dreaming*, Ballantine Books, New York.

Leibniz, G.W. (1890): *The Philosophical Works of Leibnitz*, ed. and transl. by G.M. Duncan, Tuttle, Morehouse, and Taylor, New Haven.

Lockhart C.M. and Misra B. (1986): Irreversibility and measurement in quantum mechanics. *Physica A* **136**, 47–76.

Maquet P. (2000): Functional neuroimaging of normal human sleep by positron emission tomography. *Journal of Sleep Research* **9**, 207–231.

McCall S. (1994): *A Model of the Universe*, Clarendon Press, Oxford.

McTaggart J.M.E. (1908): The unreality of time. *Mind* **17**, 456–473.

Metzinger T. (2003): *Being No One*, MIT Press, Cambridge MA.

Misra B. and Sudarshan E.C.G. (1977): The Zeno's paradox in quantum theory. In *Journal of Mathematical Physics* **18**, 756–763.

Pashler H. (1998): *The Psychology of Attention*, MIT Press, Cambridge.

Primas H. (2003): Time entanglement between mind and matter. *Mind and Matter* **1**, 81–119.

Skrbina D. (2005): *Panpsychism in the West*, MIT Press, Cambridge MA.

Stapp H. (2005): Quantum interactive dualism. An alternative to materialism. *Journal of Consciousness Studies* **12**(11), 43–58.

Strawson G. (2006): Realistic monism – why physicalism entails panpsychism. *Journal of Consciousness Studies* **13**(10-11), 13–31, followed by 17 commentaries and the author's replies to them.

Vitiello G. (2001): *My Double Unveiled: The Dissipative Quantum Model of the Brain*, Benjamins, Amsterdam.

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