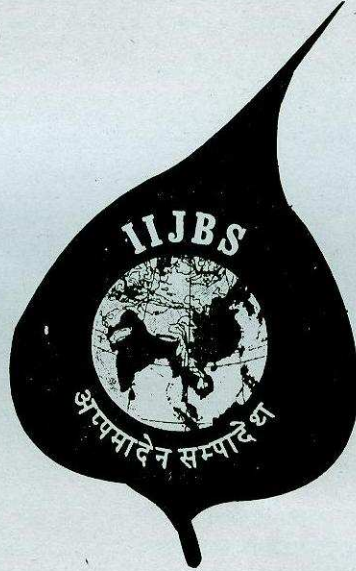


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The R-theory of Time, or Replacement Presentism : The Buddhist Philosophy of Time

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Abstract

I argue that the Indian Buddhist theory of time should be called the **R**-theory of time, and I show that the Indian Buddhist philosophy of time may be a better philosophy of time than any of the non-Buddhist accounts of time. It is a common assumption among non-Buddhist philosophers, such as Western analytic metaphysicians, that there can be relations between times. I however show that there cannot be any temporal relations. This does not harm the **R**-theory of time, since it does not involve relations between times, and thus it avoids problems I will point out to do with the temporal relations of many non-Buddhist theories of time. The **R**-theory of time also avoids the (perhaps insoluble) problem of change and identity of objects over time (object **m** can remain itself through change and can persist through time), as it is referred to by Western philosophers, and which is typically addressed in the West in the philosophies of endurantism and perdurantism. These are problems that are however found only in non-Buddhist theories of time, such as the theories of time that are widely discussed in contemporary Western metaphysics. Since the Buddhist philosophy of time does not involve issues of endurance or perdurance, and, I will argue, does not involve the interconnectedness of any different moments, I will argue that it may be the case that the **R**-theory of time is the best theory of time we have. I will further argue that science and philosophy appear to support the **R**-theory of time; and endurantism and perdurantism appear to not be supported by science and logic. I will also discuss Buddhist atomism, and give a novel account of it that apparently reveals why ultimate reality must involve replacing present moments.

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1. Introduction

The purpose of this article is to show that the Indian Buddhist philosophy of time may be a good alternative to the other philosophies of time, including the modern theories of time found in the Western tradition (the **A-**, **B-**, and pure **A-** theories of time¹). The main characteristic that distinguishes the Indian Buddhist theory of time from non-Buddhist theories of time is that, unlike non-Buddhist theories of time, according to the Buddhist theory the present *replaces*. Yandell discusses the position that time consists of *replaced* present moments, according to the Buddhist theory of time:

The Buddhist view goes as follows. A core Buddhist doctrine is that everything is impermanent. Hence persons are impermanent. At a time, a person is one or more purely momentary states. Over time, a person is a series of such bundles.... Strictly speaking, for the Buddhist the world's history is a matter of one set of states being *replaced* by another set which in turn is *replaced* by another (Yandell, 1999:5) (Emphasis added).

The Indian Buddhist philosophy of time is rarely brought up by philosophers outside the Indian tradition as a serious contender for the correct theory of time. But in this article I will argue that there may be reasons that show that the Buddhist theory is perhaps the best philosophy of time we currently have. These reasons are as follows.

- (1) Non-Buddhist theories of time, which do not involve a replacing present, typically involve the interconnection of, and/or the contacting (attaching, abutting, continuous integrating) of, moments, which I will argue in section 2 are impossible. (Some Buddhist theories of time do involve contact or *real* [rather than imagined or conceptual] interrelatedness between moments. If my reasoning in this

¹ The Pure A-theory is now typically referred to as "presentism" (only the present exists, the past and future do not exist) by Western philosophers. But I will not call it by that name, and I will use the original name, "pure A-theory, since "presentism" has many varieties, one of which is the Buddhist theory of time, and not just the contemporary Western version. Western metaphysicians typically pass over this issue, as if there is just one variety of presentism. "Pure A-theory" then denotes the specifically Western account of presentism.

article is correct, these varieties of Buddhism are apparently incorrect.)

- (2) Non-Buddhist theories of time, which do not involve a replacing present, involve the (alleged) persistence and identity of objects that change through time, but these theories may fail to explain the persistence and identity of changing objects over time.²

I will argue that the problems described in (1) and (2) are very serious, and since the Buddhist philosophy of time is the only theory of time that can be considered not to involve (1) and (2), this shows that the Buddhist philosophy of time is the best we currently have.

In this first section I introduce the R-theory in more detail. In sections 2 and 3 I will argue that points (1) and (2) above may imply that the R-theory is the correct philosophy of time.

1.1 The Doctrine of Momentariness

For reasons I give in section 2 I will call the Indian Buddhist theory of time the *R-theory of time*. I will discuss how the R-theory of time is a theory of time that involves the *doctrine of momentariness* found in Indian Buddhism (just “Buddhism” hereafter³).⁴ According

² Interestingly, regarding (2), its threat has seemed so serious to some that (2) has driven a few of the Western philosophers to attempt to describe change and identity over time by way of *inconsistency and paradox*, as if reality really contained inconsistencies not invented by the human mind. (See Mortensen, 2002.)

³ I refer to the R-theory of time as the *Buddhist* theory of time. But the R-theory is really mostly in accord with Buddhism in the *Indian* tradition. A philosophy of an eternal, unchanging, ultimate reality, which was espoused by many later non-Indian forms of Buddhism, was specifically denied by Sākyamuni. So the R-theory is not in accord with some of the later forms of Buddhism, such as Tendai. (For discussion of these issues see Swanson, 1997.) I will nevertheless refer to the R-theory (replacement presentism) as the *Buddhist* theory of time, since it is in accord with the Indian Buddhists, such as Dharmakīrti and others, and since a philosophy of *replacing* presents is also how others discuss “the Buddhist theory.” For example, this is how Yandell referred to “the Buddhist view” in the passage of his I cited at the start of this article, where he refers to the *replacement* of presents as the *Buddhist* position, even though it is a reference mainly to Buddhism in the Indian tradition.

to the doctrine of momentariness, if an object *m* changes, whereby it is no longer *m* but is *m**, *m* is destroyed and *m** comes into existence. If the doctrine of momentariness is an account that gives a correct description of any object, including all of reality, then no entity persists through time, and I will explain in the next paragraph that all entities that make up reality only exist for a durationless instant. This is the position that was held by Buddha:

How can there be laughter, how can there be pleasure, when the whole world is burning? When you are in deep darkness, will you not ask for a lamp?

Consider this body! A painted puppet with jointed limbs, sometimes suffering and covered with ulcers, full of imaginings, never permanent, for ever changing.⁵

The doctrine of momentariness can be more fully explained if I discuss *motion*. The Buddhist holds that, as Śāntirakṣita puts it, “[t]he essence of reality is motion.”⁶ This is supported by the theories of quantum physics, according to which reality consists of particles in motion.⁷ If the quantum particles that make up reality are in motion, then all of reality is activity and movement,⁸ just as the Buddhist maintains. If the essence of reality is motion, it appears that reality

⁴ There is one rarely discussed Western and non-Buddhist philosophy of change and time that involves momentariness. It was held by the ancient Greek Cyrenaic School. (See Tsouna, 1998.) The physicist Neils Bohr may also have espoused with momentariness; I will discuss Bohr later in this article. And in 3.1 I discuss how much of modern physics may predict that momentariness is the correct account.

⁵ *Dhammapada*. 1973. New York: Penguin Books. Verses 146-147.

⁶ Śāntirakṣita, *Tattvasaṃgraha*, 138.9. Quoted in Stcherbatsky, F. Th., 1962 (1930). *Buddhist Logic*. Volume 1, Page 82.

⁷ What is meant by “motion” will be discussed more below.

⁸ The idea that change is the essence of reality is also found in the ancient Greek philosopher, Heraclitus. Stcherbatsky writes:

The idea that there is no stability in the external world and that existence is nothing but a flow of external becoming, is familiar to us from the history of Greek philosophy where in... Heraclitus it marks an episode in its early period, an episode *which was soon forgotten* in the subsequent development of Greek thought. (Stcherbatsky, 1962 (1930): I.82.) (Emphasis added.)

must in fact consist of constant change. Thus all items of reality, and reality itself, obey the doctrine of momentariness, where the items of reality, exist for a durationless instant, and are destroyed. If this is the case, then all of reality is momentary, *regardless* of whether or not humans believe they perceive stable, motionless, persisting objects, such as a cup resting on a table in a still room. (In a section below I will discuss an objection to the idea that if quantum particles change then the macroscopic objects made of the particles must also change.) An experience of persistence and stability would merely be a mental error, if the **R**-theory is a correct theory of time. Observers, which are also momentary, can perceive the moments one after the other, but the non-nirvanic observer is unaware of the emptiness (durationlessness, impermanence) of all things, and instead erroneously perceives objects persisting through time. Brown writes:

The thickness of a moment is conceived as a durationless point... The duration of the moment is bound up with a theory of momentary states of consciousness that are the phenomenal equivalents of atomic point-instants. Consciousness and the duration of conscious experience are thought-constructions of the... similarities of the momentary flashings... [D]uration is added by the mind to the series of changing points... It is not sufficient, however, to argue that duration is a contribution of the mind to entities that are durationless. Such entities depend on the cognitive laws that govern the process of "thought-construction," and these laws are as yet unknown (Brown, 1999 : 263).

Temporal duration and the identity of objects through time do not exist outside of imagination. They are merely the mental constructions of the non-nirvanic mind. Actual reality involves no *real* duration, no *real* time-flow, no events that are side-by-side one another where some events are past, others are future, and one is present. Rather, according to the **R**-theory of time, temporal duration, change, and identity of objects over time, are fabricated *experiences* of the specious present,⁹ constructed and believed to exist by the non-

⁹ Le Poidevin lucidly clarifies what is meant by this phrase:

The term 'specious present' was first introduced by the psychologist E.R. Clay, but the best known characterization of it was due to William James, widely regarded as one of the founders of modern psychology. He lived from 1842 to 1910, and was professor of philosophy at

nirvanic observer. There are only present moments existing one-after-the-other, flashing in and out of existence: present p_1 is replaced by present p_2 , p_2 is replaced by p_3 , p_3 by p_4 , and so on. Mookerjee explains:

The theory of flux holds that all existents are momentary, existing only for the moment and disappearing..., in which [a]... facsimile of the previous entity crops up. This process of duplication and re-duplication goes on for any length of time and this is the reason why entities are *prima facie* looked upon as continuous. In reality, however, there have been many entities, one similar to the other, and this similarity in appearance is mistaken for their unchanged identity. This is so far an intelligible position. The real difficulty, however, crops up when a dissimilar entity emerges, as, for instance when the seed-series disappears and a different series in the shape of the sprout springs into being (Mookerjee, 1935 : 39).

What Mookerjee calls *the duplication process*, and what Yandell and I call *the replacement of presents*, give rise to the non-nirvanic illusion of the experience of persisting and/or unchanging

Harvard. His definition of the specious present goes as follows: 'the prototype of all conceived times is the specious present, the short duration of which we are immediately and incessantly sensible' (James, 1890)... Elsewhere in the same work, James asserts 'We are constantly aware of a certain duration-the specious present-varying from a few seconds to probably not more than a minute, and this duration (with its content perceived as having one part earlier and another part later) is the original intuition of time.' This surprising variation in the length of the specious present makes one suspect that more than one definition is hidden in James' rather vague characterization. One could define it, for example, as the extent of short-term memory, in which case it might well vary from person to person, and also from one sense modality to another. Or it might be the interval in which information is experienced as a single unit (say a sentence, or musical phrase)-a rather ambiguous and unsatisfactory definition. A quite different definition is this: the interval of time such that events occurring within that interval are experienced as present. This is how the specious present tends to be treated in recent discussions, though it is inconsistent with James' remark that we can discern earlier and later parts in the specious present. As we remarked at the beginning of this article, if two events are experienced as present, they are surely experienced as simultaneous. (Le Poidevin 2003)

objects, such as when one looks at a cup resting on a table in a still room and believes it to be unchanging and motionless while existing through a duration. In the present the non-nirvanic observer recollects experiences of the cup from moments which *now* do not exist. Through memory the non-nirvanic observer compares and combines experiences of the cup at different moments, which have been replaced, in order to create the illusion of a cup that persists through time.

1.2 Overview of Article

The reader should note that I am a Western analytic philosopher, and for that reason this article may inevitably appear, to some degree, to be from the perspective and writing style of a Western philosopher. But I am also quite familiar with Buddhist philosophy, and I assert that my background in Western analytic metaphysics does not harm my analysis of Buddhist philosophy.

In section 2 I argue that if moments could exist side-by-side one another, like the beads of a pearl necklace, as is held in most philosophies of time in the contemporary Western tradition (the A-theory and the B-theory), then on that account, the moments that are side-by-side cannot be *connected* to one another, and they cannot be in *contact* with one another. I will further argue that this may show that *presentism* (the position that the past and future do not exist) is the correct theory of time. Then I will argue that if presentism is the correct theory, and if there is change (i.e., if the present changes), then it can only be the case that the present *replaces*, which is the distinct feature of the Buddhist philosophy of time.

In section 3 I discuss how the R-theory of time avoids the Western debates on endurantism and perdurantism. The endurantism and perdurantism debates are specifically aimed at attempting to *avoid* the doctrine of momentariness and the problem of change: they are attempts to explain the *persistence and identity of changing objects* through time. I argue that the drive to *solve* the problem of change and identity over time, and to get around the doctrine of momentariness, is generated by what the widely discussed Western philosopher Michael Loux calls “prephilosophical intuition” (Loux, 1998 : 324).¹⁰ I will describe what Loux means by this, and I will argue that the placing of such importance on *prephilosophical*

¹⁰ I will give Loux’s full citation in section 3.

intuition is unwarranted, and it is science and logic, rather than prephilosophical intuition, that give us successful theories for describing reality. Furthermore, I will argue that science and logic support the **R**-theory and do not support prephilosophical *intuition*. For those reasons, which will be given in more detail in section 3, I will find that the **R**-theory may be a better theory than the non-Buddhist theories that are based on endurantism and perdurantism.

In section 4 I discuss how a group of Western metaphysicians called *bare particular theorists* may believe they can avoid the doctrine of momentariness and the **R**-theory. But I will find problems with their account.

In the conclusion I will argue that a novel approach to Buddhist atomism that I will give explains *why* presents replace.

2. The R-Theory of Time

In this section I will argue that presentism must be the correct theory of time, and I will argue that the correct variety of presentism is one where the present *replaces* itself. Since such a theory is in accord with the Buddhist philosophy of momentariness, then if my argumentation in this section is correct, it reveals that the Buddhist theory of time is the correct theory of time.

2.1 The R-theory

I will give the Buddhist theory of time two names. The first name is, as mentioned, the *R-theory of time* (where “**R**” stands for “replacement”). I use this label in order to put the Buddhist theory of time more in line with the names given to the existing theories of time in the metaphysics of the Western tradition. The theories of time in the Western tradition are the *A-theory* of time, the *B-theory* of time, and the *Pure A-theory* of time.¹¹

Oaklander describes the **A**- and **B**-theories:

...[T]ime [involves] events strung out along a series united to one another by the relations of *earlier than*, *later* and *simultaneity*... The events in the temporal series are fixed in that they never change their position relative to each other... It has become customary to call the entire series of events spread out along the time-line from earlier to later, the “**B**-

¹¹ Western metaphysicians also discuss mixtures of these.

series.” When viewed solely in terms of the **B**-series, time is thought of as *static* or unchanging for there is nothing about temporal relations between events that changes...

Time not only has a static aspect, it also has a *transitory* aspect. In addition to conceiving of time in terms of events standing in temporal relations, we also conceive of time and the events in time as moving or passing from the far future to the near future, from the near future to the present, and then from present they recede into the more and more distant past... When events are ordered in terms of the notions of past, present, or future they form what is called an “**A**-series.” It should be noted, of course, that the **A**- and **B**-series are not really “two” different series of events, but the same series ordered in two different ways (Oaklander, 1995 : 69).

The phrase “pure **A**-theory” has been largely equated with the term “presentism” in recent years. It is the position that only the present exists. Oaklander discusses it in a passage about the account of the pure **A**-theory espoused by William Lane Craig, a major philosopher of time in the West:

Craig’s version of the pure **A**-theory, known as “presentism,” purports to avoid... the problem of change... According to presentism, only the present exists. Thus, it is not the case that, say, **O** is green and [then] **O** is red [if, for example, **O** is a tomato] (Oaklander, 2004 : 27).

(Note how Oaklander points out that Craig endorses presentism because Craig wishes to avoid the *problem* of change: the *problem* of explaining how there can be persistence and identity of changing objects through time. Western philosophers typically call this “the *problem* of change” because it is standard for Western metaphysicians to hold that momentariness is *not* the correct account of reality, but it is also widely acknowledged that it is unclear how to describe change without momentariness. This demonstrates how persistence and identity of changing objects over time are recognized as being problems that are unsolved, despite what the endurantists and the perdurantists assert to the contrary. I will discuss this in section 3.)

The pure **A**-theory of the Western metaphysicians is alleged to be a presentist theory. But if it is, it is not the same variety of

presentism as Buddhist presentism, since the Buddhists' account involves a momentary *replacing* present, but the Western metaphysician's pure **A**-theory does not.

Typically Western metaphysicians only recognize the **A**-, **B**-, and pure **A**-theories of time, and ignore the Buddhist theory of time. In the following passage, consider how Oaklander writes about "the nature of time", and how there is no mention of any theories but **A**- and **B**-theories. (In the passage, Oaklander does not bring up *pure A*-theory because Western metaphysician typically consider it a type of **A**-theory, and thus it is considered to (somehow) be a *tensed* theory of time—but *how* this could be is questioned by many.)

One of the most hotly contested issues in metaphysics today concerns the debate between those who hold the tensed theory or **A**-theory of time, [and] those who hold the tenseless or **B**-theory of time... The debate between these three theories concerns the question of whether the ultimate metaphysical nature of time is to be understood in terms of temporal becoming, temporal relations, or both temporal become and temporal relations (Oaklander, 2004 : 27).

As mentioned, the distinction that the **R**-theory of time has from the **A**-, **B**-, and pure **A**-theories of time, and any other non-Buddhist theories, is that the non-Buddhist theories of time all do not involve a *replacing* present. Also, unlike the **R**-theory, the **A**- and **B**-theories of time are not *presentist* theories of time. And another distinction between the Buddhist theory of time and the non-Buddhist theories of time, including the **A**-, **B**-, and pure **A**-theories, is that the non-Buddhist theories typically do not hold that the endurance or perdurance of objects is *illusory*.

2.2 Replacement Presentism

The second name I give to the Buddhist theory of time is *replacement presentism*. I use the term "presentism" since, according to Buddhism and the doctrine of momentariness, only the present exists due to the fact that only one moment ever exists. The reason there are no moments before or after the present is because, in a theory of time and change based on momentariness, where moments are destroyed and copies of moments come into being, the destruction of one moment and the creation of another indicates that there can

only ever be one moment. I argue why this is the case in much more detail in this subsection.

I use the word "replacement" because if there is no persistence, there cannot be two moments side-by-side in time lest there be a possibility that in some pair of moments that are side-by-side somehow the same object shows up in *each* moment and thus persists. If there were, for example, two moments next to one another, this would mean that a given moment is not destroyed when a following moment comes into being, and instead when one moment comes into being, there is a moment before it that has not been destroyed. This is not the Buddhist position since it could violate the logic of Buddhist momentariness. But if it were instead that case that there is only one moment that ever exists, and two moments can never exist side-by-side, then it can only be the case that one present moment (p_1) is completely replaced by another (p_2). If only one moment ever exists it can only be a *present* since it is *a now*, and since there are no moments before or after it to make it a past or future.

If moments exist side-by-side (i.e., if presentism is false), it seems that the non-Buddhist philosopher can justifiably *disagree* with the Buddhist position that there is no carryover or "temporal overflow" (King, 1963 : 124) of an object from one moment to the next, whereby there could be persistence. It would however be impossible for there to be any possibility of there being persistence of some object from one moment to a following moment if it were found that there are *not* any moments that can be side-by-side. I will show that moments apparently cannot be connected or in contact in any way, and then I will argue that this conclusion leads to the position that there is only one moment.

If moments exist side-by-side in the non-Buddhistic way just mentioned, they apparently do so in one of two ways:

- i) The moments that are side-by-side one another *abut* or *contact* one another, or if they do not *abut* or *contact* one another,
- ii) The moments that are side-by-side one another *interrelate* with one another.

i) may also be a sort of relation; so if that were the case, there would merely be two sorts of relations: a relation of direct *abutment* or direct *contact* (point i) above), and a relation of connection without direct *abutment* or direct *contact* (point ii) above).

I will argue that moments *cannot* interact by i) or ii). If I am correct, this would be a problem for non-Buddhists who espouse rather than reject i) and/or ii). If the Buddhist espouses i) or ii), I maintain that the Buddhist holding that causation of moments occurs by i) or ii) is susceptible to attacks from Western philosophers of time, as discussed in the previous paragraph. Rejection of i) and ii) is not the rejection of causation; rather, it is the rejection of causation by contact or relation. Rather than i) or ii) being the means by which a moment causes another moment, if i) and ii) lead to contradiction, as I will argue they may, it would apparently be the case that a sort of Humean causation must be espoused.

2.2.1 A Humean-Buddhist Account of Time and Causation, and Buddhist Double Reality

On the Humean account of causation, it is considered significant that the empirical witnessing of a real *connection* or *contacting* between events never occurs. Rather, there is only the witnessing of events following one another, where the empirical mind never experiences *contact* between moments, or any real *relation* or *connectedness* “stretching” from one moment to the succeeding moment. Hume writes: “When many uniform instances appear, and the same object is always followed by the same event; we then begin to entertain the notion of cause and connexion.” (*Enquiry*, p. 78)¹² The empirical mind imagines and fabricates the idea that there is a *non-empirical* relation or connection between moments, where the unobserved relation or connection is distinct from the moments that are experienced empirically. This is much like the position held by Dharmakīrti: “...(in reality) the positive entities, by themselves, are unrelated. It is the imagination (*vāsanā*) which mixes them (and so they appear as related) (Jha, 1990 : 13).”

Also, although the empirical mind may *imagine* or *believe* that moments “touch” or contact, there is however no empirical evidence for such “touching” or contacting, for the following reasons. The empirical mind is locked in the present: the only experiences it ever has are *present* experiences. Memories only occur in the present, and thus are not an example of the empirical mind possessing evidence of the existence of the past. According to presentism, the past is merely

¹² Cited in Pojman, Louis P., 2001. *Philosophy: The Quest for Truth*. New York: Oxford University Press. Page 329

moments that no longer exist, but which may be known via present memory, since the moments that have been replaced by a new present moment. I imagine that temporal parts theorists¹³ will have an objection to what has just been written. It could be the case that the empirical mind believes that past times exist (i.e., it believes that presentism is false), and that states of one's empirical mind *can* thereby exist as past, and thereby witness pastness. But this position would be a *non-empirical* position, since the strictly empirical mind is always located in a *now*. For the empirical mind to theorize that it has temporal parts that exist in the past would be to stray into what is beyond the empirically knowable. If in each state of its existence the

¹³ Temporal parts theory, which is an opponent theory of presentism, and which is very widely held in Western analytic metaphysics, can be grasped from a lucid passage from Hawley:

You're performing an amazing trick right now: you're in two places at once. How do you manage to be down there, near the floor, and yet also be a metre or two up in the air? Well, it's not so very amazing: your feet are down there on the floor, and your head is up in the air. Having spatial parts enables you to be in several different places, and to have different properties in different places: you're cold down there on the tiled floor, and also warm up there by the heater, because your feet are cold and your head is warm. Moreover, having parts could let you be in the same place as someone else: if you shared a hand with a conjoined ('Siamese') twin, then you could both wear the same glove without jostling for space...

Things and people take up time as well as taking up space: you existed yesterday, and, unless reading this article is a real strain, you will exist tomorrow too. Just as you can have different properties at different places (hot up here, cold down there), you can have different properties at different times (yesterday you hadn't heard of temporal parts, by tomorrow you'll know plenty about them).

Some philosophers believe that you take up time by having different temporal parts at different times. Your spatial parts are things like your head, your feet and your nose; your temporal parts are things like you-yesterday, you-today and you-tomorrow. If you have different temporal parts, this would explain how you can exist at different times, and it would also explain how you can have different properties at different times (you-yesterday hasn't heard of temporal parts, you-tomorrow is an expert). According to these philosophers, then, persisting through time is pretty much like extending through space: it's all a matter of parts. (Hawley, 2004, section 1)

empirical mind only exists in the present and thus only has evidence for the existence of the present, then it has no evidence that moments before or after the present exist, and thus has no evidence that there is contacting or "touching" between moments, or that there are interconnections between moments. For these reasons, if the empirical mind contains the belief that there can be contacting or interrelating between moments, it is non-empirical imagination, rather than empirical observation.

Comparing Humean and Buddhist causation is of course not new. In an article specifically about the similarities of Humean causation and Buddhist causation, Jacobson writes:

Both Hume and the Buddha insist that it is wrong-headed to call some enduring, ever-identical self more real than our changing states. Both insist that the experiences themselves are spread upon no substance and upon no substantial self but constitute a process in and for themselves... The Buddhist position is that there is no self-identical self, only "the perpetual flux and movement," the abiding flow, but that each of us is "a numerically new actuality every moment," as Hartshorne (1960 : 298-302) has put it. Hartshorne presents what he calls "the Buddhist-Whiteheadian doctrine" as a "radical pluralism" that takes its stand with our "successive experiences" or "successive actualities," arguing that these are "the primary units of the plurality" constituted by "the momentary experiences or selves" (Jacobson, 1969 : 18-19).

For Hume, however, unlike Leibniz, there can be no thought of events being related to all the other things of the entire universe... Only the momentary event itself, co-present with others, is what we perceive. Events contiguous in time and place, Hume observed, can be and are considered in terms of cause and effect, but this is chiefly a way of thinking, a manner of speaking, a cultural habit which leads us to look at one event as cause, the other as effect, and the bond between them as the "supposititious cause." When we really analyze our experience, all we find is the momentariness of events and the cultural habit or "propensity to feign" supposititious causes, which habit or propensity deadens our sensitivity to

the sheer momentariness and co-arising (dependent origination) of the events.¹⁴

In a Humean-Buddhist model of causation, ultimate reality does not involve any connection or contact between moments. Rather, there is only the witnessing of the *moments themselves*, following one-after-the-other.¹⁵ Causation can be considered a relation or contacting between moments only from the perspective of the non-nirvanic empirical mind. The empirical perspective is opposed to the causation of the transcendental (nirvanic), wherein the durationless present moments themselves *are* causes. Buddhist philosophy involves both theories of causation: empirical and transcendental.

These two positions on causation correspond to the Buddhist “double reality, the ultimate reality of things by themselves and the psychologically constructed reality (i.e., unreality) of empirical things.”¹⁶ The “double reality,” to use Stcherbatsky’s term, is empirical versus transcendental reality, or unreal versus nirvanic reality: the conceptual versus the real. Since a double reality is considered in Buddhism, Stcherbatsky discusses how there are two sorts of causality that need to be considered. One is what we can all transcendental causality, and the other empirical causality:

...[T]here are two different realities, a direct one and an indirect one. The one is ultimate and pure,—that is the reality of the point-instant. The other is a reality attached to that

¹⁴ Jacobson, 1969 : 20. Some have denied that we can compare Humean causation to Buddhist causation. See Cruise 1983. If my arguments in this article are correct, it would appear that Cruise’s assertions are incorrect. Surprisingly, Cruise does not mention Jacobson in Cruise 1983.

¹⁵ This may also be similar to J-P. Sartre’s positions. In a book where he compares Sartre to the early Buddhists, Medhithammarn writes that Sartre holds that “[e]ach instant of consciousness is a new existence which does not arise out of a prior instant.” (Medhidhammaporn, 1988 : 21). Sartre writes that “between two [momentary] consciousnesses there is no cause and effect relationship... Our consciousness is not the cause of another.” (*The Psychology of Imagination*, p. 27, Frechtman trans.)

¹⁶ Stcherbatsky, F. Th., 1962 (1930) : I.143. Stcherbatsky discusses this in a very interesting passage where he is comparing Buddhism to the philosophy of Immanuel Kant. Many have drawn similarities between some Europeans, such as Hume and Kant, and the Indian Buddhists.

point-instant, it is mixed with an image artificially constructed by the faculty of our productive imagination. That is the reality of the empirical object. Consequently there are also two different causalities, the ultimate one and the empirical one. The one is the efficiency of the point-instant, the other is the efficiency of the empirical object attached to that point-instant... ...[T]here is no separate efficiency, no efficiency in superaddition to existence, existence itself is nothing but causal efficiency,... the cause and the thing are different views taken of the same reality... If we identify reality and causal efficiency, we can say that every reality is at the same time a cause. If we separate them, we must say that efficiency is impossible, because it involves us into a proposition which two contradictorily opposed predicates, since one thing then must exist at two different times in two different places, i.e. exist and not exist in the same time and place...

There are thus two causalities, the one real ultimately, the other real contingently or empirically, just as there are two realities, the transcendental reality of an instant and the empirical reality of a thing of limited duration (Stcherbatsky, F. Th., 1962 (1930) : I.125-127).

The first sort of causation mentioned above, which is associated with the empirical life, can be called *contingent*, *conceptual*, or *empirical causation*, and it involves non-nirvanic imaginary experience of duration and time, where one static time t_1 *contacts* and/or is *related to* another static time t_2 . Of course this sort of contact or relation is impossible, since, as Dharmakīrti writes: "...[H]ow can... the cause and effect relationship (existing in two things) be possible, because the cause and the effect do not coexist? If it cannot exist in two how can it be called a relation?" (In Jha 1990, 17). I discuss many other problems with empirical causation below.

The second sort of causation mentioned above—*real*, *transcendental*, or *necessary causation*—involves direct awareness of momentary reality. Real (transcendental) causation is discussed by Stcherbatsky:

[Buddhist causation] is marked by the name of Dependent Origination... Reality, as ultimate reality, reduces to point-instants of efficiency, and these point-instants arise..., or

exist, only so far as they are efficient, that is to say, so far they themselves are causes. Whatsoever exists is a cause, cause and existence are synonyms ... Just as real existence is only a point-instant, just so a real cause is only this same point-instant...

Thus the Buddhist theory of Causation is a direct consequence of the theory of Universal Momentariness. A thing cannot be produced by another thing or by a personal will, because other things or persons are momentary existencies. They have no time to produce anything. Not even two moments of duration are allowed them. Just as there is no real motion, because there is no duration, just so there can be no real production, because time is needed for that production... [T]he cause can exist no more when the effect is produced. The effect follows upon the cause, but it is not produced by it. It springs up, so to speak, out of nothing,...¹⁷

In this article I show that according to the **R**-theory of time, which involves a Humean-Buddhist theory of causation, empirical causation (relations and/or contact between moments) is mental construction (imagination), and transcendental causation is real. Then I argue that positions i) and ii) are impossible (relations and contact between moments are impossible). In 2.2.2 and 2.2.4 I will argue that moments cannot contact (or “touch”) one another, and in subsections 2.2.3, and 2.2.5 – 2.2.6 I will argue that, if contacting is not possible among the point-sized moments, then moments however also cannot be interconnected to one another in any way.¹⁸

2.2.2 The Impossibility of Moments Abutting

I will first consider i), where moments contact one another. On the account where two moments contact or abut, consider that two moments are side-by-side one another, one moment being the present, p_0 , and the other being the moment before the present, p_{-1} . If p_0 , being

¹⁷ Stcherbatsky, F. Th., 1962 (1930) : I.119-120. This conclusion, that real causal moments come out of nowhere, or out of nothing, will be significant when I compare the **R**-theory of time with quantum mechanics in the conclusion of this article.

¹⁸ In Grupp 2005 (forthcoming), I also argue that there cannot be any relations or connections between times.

a moment, is a location in time,¹⁹ then any other moment *contacting* or *abutting* p_0 , such as p_{-1} , which is aside p_0 , can only also be located at the present, for the following reasons. Moment p_0 , the present, is a location in time. If p_0 is a location in time, then it is not located where, for example, p_{-1} is, since that would mean p_0 is not identical to itself: p_0 would be a present moment that is located in the past (a present moment that is not the present). In other words, if p_0 and p_{-1} are distinct locations in time, then it must be the case that p_0 is not where p_{-1} is, and p_{-1} is not where p_0 is. But if p_0 and p_{-1} have any sort of interplay (such as contacting, attaching or abutting to one another), then they would apparently have to coincide (fully or partially, depending on the nature of the moments) for reasons explained next. If p_{-1} contacts or abuts p_0 , then p_{-1} , would have to “go where p_0 is” in order to contact or abut p_0 . p_{-1} , which is past, must also be present—it would have to be *present* if it is to contact or abut p_0 , if it is to have anything to do with p_0 . Also, p_0 would be a present that is located in the past, which is a contradiction.²⁰ (An objection to this conclusion will be given in 2.2.3 where I consider that p_{-1} and p_0 can attach, contact, or abut without coinciding.)

2.2.3 The Impossibility of Moments Interrelating

I will discuss issues to do with moments contacting one another more in the next subsection. But before that, in this subsection I will discuss the other option: instead of contacting, moments that are side-by-side one another in non-presentist reality might be interconnected or interrelated.

¹⁹ We can consider it a location since p_{-1} , which is next to p_0 , has locatedness since p_{-1} and p_0 can be considered in the mind in comparison to one another, associated with one another, or if there were relations and/or contacting between the moments (which I am currently arguing there cannot be), then the relations will have mind-independent (realist) relations or contacting between them.

²⁰ The conclusions drawn in this paragraph about the contacting or abutting of moments in a time series come from conversations I had about Grupp 2003 with Joshua Upson and Christopher Dillon of Western Michigan University.

It is often held by philosophers that moments are point-sized (durationless), and accordingly do not have a (temporal) size.²¹ Without a size it is unclear how moments can contact or abut one another since they do not have a surface by which to contact any other items. If that is the case, then if there were any moments that are side-by-side one another, making up a time-series, then the problem of how they contact is apparently solved if the moments *interrelate* in some way. On this account, p_1 and p_0 are interrelated but not abutted or directly in contact. I will argue for the impossibility of *any* sort of relation between p_1 and p_0 . The impossibility of relations between distinct items has also been argued by some of the great Buddhist philosophers, such as Dharmakīrti, who was aware of the outcomes of some of the issues that will be put forward in this section: “if two entities are different, how can they be related? And if they are not different, what is the point of talking about a relation?”²²

If a relation interconnects moments, such as moments p_1 and p_0 , it must coincide with the moments it interconnects. To do this, the relation must make contact with or abut with, the moments it interrelates, lest it not interrelate the moments.²³ I will first assume that the relation between moments p_1 and p_0 is a *simple* relation (a relation that does not have any parts). If the simple relation, in

²¹ St. Augustine allegedly proved that there cannot be individual moments that have temporal size which goes something like this. If individual moments did have a temporal size, one half of the moment would not collocate with the other half, and thus one moment would be past the other, thereby the entire time atom (chronon), being describable as one thing (since it is an atom), would be describable at past and not in the past, which appears contradictory. If there were no temporally extended moments, this might be another problem that the Buddhist who hold that moments causally “contact” would have to address, since it appears unclear how there can be contacting (“touching”) between items that do not have a surface or extension by which to touch one another. Also see arguments about problems with chronons in Pyle (1995 : 50-59).

²² *Sambandhaparīkṣā*, Dharmakīrti, verse 3. Quoted in Phillips, 1995 : 331.

²³ Those concerned with the exemplification tie or instantiation relation that Western metaphysicians allege to act as an *intermediary* between the relations and the moments and thus tying relation to moments, this will be discussed in section 2.2.5

interrelating p_1 and p_0 , contacts or abuts p_1 and contacts or abuts p_0 , then by its doing so, the relation is both past and present. This is a contradiction because the relation cannot have parts that have different characteristics (being past, being future) since the relation is partless. Since the relation is partless, it is one entity, and thus the *entirety* of the relation would be describable by the self-refuting statement: "Atom (partless object) that is simultaneously at time p_0 and not at time p_1 ."

Some may argue that the relation between p_1 and p_0 does not have to be simple, and the relation could have parts (it could be a *complex* relation). If the relation between p_1 and p_0 had parts, it could have a part that only coincides with p_1 , and a part that only coincides with p_0 , thus avoiding the problems to do with the simple relation described in the previous paragraph. But this is of no avail, for the following reasons. If one part of the relation is at p_1 , and the other is at p_0 , then these parts have to also attach to one another in order to form a continuous (unbroken) connection of p_1 and p_0 . But in doing so, the same sort of problems as discussed above in subsection 2.2.1 about the attaching, abutting, or contacting of moments p_1 and p_0 would ensue in this case with respect to the parts of the complex relation. If the part of the relation at p_1 , call this part of the relation r_{past} , directly contacts or abuts the part of the relation at p_0 , call this other part of the relation r_{present} , then r_{past} would have to be where r_{present} is if r_{past} is to have any sort of interaction (such as contact, tying, abutment, or attachment) with r_{present} . In other words, r_{past} would have to "go where r_{present} is" in order to attach to r_{present} since r_{present} is only where it is, and to interact with it, the interacting item must be where r_{present} is. If that is the case, however, then, for example, r_{past} would be where r_{present} is located (in the present), which is an apparent contradiction, since it would imply that it is a past item is not past.

2.2.4 Moments Contacting without Coinciding

In this subsection I return to the position discussed in 2.2.1, where it was assumed that moments that are side-by-side can touch, contact, or abut. There could be an objection one might draw to the conclusions of 2.2.1 regarding the contacting or abutting of p_1 and p_0 . Imagine that contact between moments is not a relation, but is somehow some sort of non-relational interaction between moments

(this avoids the problem just discussed in 2.2.2). Also, imagine that it may be the case that p_{-1} and p_0 contact without coinciding: p_{-1} contacts p_0 , but p_{-1} and p_0 do not coincide in any way, and thus in attaching or contacting p_0 , p_{-1} never becomes present in doing so (this avoids the problem brought up in 2.2.1). In other words, p_{-1} and p_0 contact one another by attaching or contacting but do not collocate partially or fully in any way in doing so: p_{-1} never strays into p_0 , and p_0 never strays into p_{-1} , and their interface is one where it is not the case that an item that can only be past (p_{-1}) is also present, or an item that can only be present (p_0) is also past. (This objection could also be given in a similar way for r_{past} and r_{present} , where r_{past} and r_{present} are alleged to contact without coinciding).

Assuming there can be this sort of contacting, I will proceed to analyze it. The present appears to be durationless (a time point). Consider a passage cited in Stcherbatsky and which is attributed to the Buddha himself:

All (real) forces are instantaneous. (But) how can a thing which has (absolutely) no duration, (nevertheless have the time) to produce something? (This is because what we call "existence" is nothing but efficiency which is called a "creative cause."²⁴

Contact without coincidence, however, apparently does not work for moments that are point-sized, for reasons given next. If a point-sized (durationless) moment contacts another point-sized moment, and the moments do not coincide with one another, but rather are at a distance from one another (at a temporal distance from one another), they cannot touch or contact since there is a distance between the moments. But if they are not at a distance, then they are the same moment. For the same reasons that points (numbers) on the number line cannot be in contact, and if it is the case that p_{-1} and p_0 are point-sized, then what we are calling "contact without coincidence", does not work for point-sized items. For these reasons, many philosophers have stated that touching must involve a common or overlapping boundary point.

Perhaps there is another alternative for discussing the "contact without coincidence" of moments if one espouses the philosophy of *chronons*: atoms of time that have an irreducible duration (a temporal

²⁴ This is quoted in Stcherbatsky, F. Th., 1962 (1930) : I.119.

size). Chorons, if they exist, avoid the entire issue of, and problems surrounding, point-sized (durationless) items contacting one another. In considering that p_{-1} and p_0 are chorons, if it is alleged that p_{-1} and p_0 contact or abut one another without coincidence, p_0 and p_{-1} cannot abut or contact one another by partial collocation since they do not coincide in any way. Without coinciding, p_0 is in no way located at p_{-1} , and p_{-1} is in no way at p_0 .

Call the contact interface of p_{-1} and p_0 I_{NC} (“ $_{NC}$ ” stands for “no coincidence”). In giving rise to a continuous (unbroken) integration between p_{-1} and p_0 that does not involve coincidence, I_{NC} is merely the non-coinciding interfacing of p_{-1} and p_0 . I_{NC} must exist if there is a continuous (unbroken) connection between p_{-1} and p_0 . There is no gap between p_{-1} and p_0 and thus I_{NC} does not have size (it does not have a temporal thickness), and this appears to imply that I_{NC} does not have any parts (but I will discuss an objection to this below).

There however appears to be a problem with this account. p_{-1} never extends into p_0 , and p_0 never extends into p_{-1} . The interfacing that p_{-1} does is only in the past, and the interfacing p_0 does is only in the present. (If p_0 is the present moment, then it cannot “do” something, such as *interface* with another item, while not being present.) If that is the case, since there is interfacing going on in both past and present, then the interface is both past and present. But this cannot be the case, however, since the interface does not have parts, and thus any statement about it describes all of it. So if I_{NC} is in the past, I_{NC} is entirely describable as being past. And if I_{NC} is in the present, I_{NC} is entirely describable as being present. But if I_{NC} is entirely present, and entirely past, it involves contradiction since past \neq present, and one could assert, for example, that I_{NC} is past and not past.

If, however, one wished to describe I_{NC} as *having parts*, there are several problems with this abstruse account. First, it seems that we can only discuss items that are individual existents having parts. But I_{NC} may not be anything more than a way of describing p_{-1} and p_0 , rather than an individual item that is distinct from p_{-1} and p_0 . It is questionable whether or not I_{NC} —this interfacing of p_{-1} and p_0 —has any independent reality in itself, as an entity distinct from, and over-and-above, p_{-1} and p_0 . It appears that I_{NC} may merely be a description of the way p_{-1} and p_0 are, not about an additional entity different from

p_{-1} and p_0 . But, if I_{NC} was an entity that is distinct from p_{-1} and p_0 , it would be some sort of bridge that is contacting (or “touching”) both p_{-1} and p_0 , and for that reason it would be susceptible to the problems that a *relation* was susceptible to in above subsection 2.2.2 (and the further problems I will discuss in the next subsection).

But I will put aside the issues just raised, and I will instead imagine that p_{-1} and p_0 can interface by way of I_{NC} where I_{NC} has parts. This however only appears to lead to more problems. If I_{NC} somehow has parts, then if p_{-1} and p_0 are to have coincidence without contact, and to have a continuous (unbroken) connection between the chronons, p_{-1} and p_0 , then the parts of I_{NC} would have to bond, tie, or link, and the problems much like those discussed in this section regarding p_{-1} and p_0 contacting or relating to one another would arise for the parts of I_{NC} . If a part of I_{NC} in the past, call it $I_{NC-past}$, interfaces with part of I_{NC} in the present, $I_{NC-present}$, then for $I_{NC-past}$ and $I_{NC-present}$ to interface, either they will have to do so by partial or full *coincidence*, which was found to be problematical among past and present items in section 2.2.1; or they will have to intermingle by *interrelating*, which was found problematical among past and present items in 2.2.2; or by interface without coincidence, which has been found problematical in this subsection. In the next subsections of this section (2.2.4 and 2.2.5), I discuss a few more problems about a past item having any sort of interplay with a present item; it seems that those problems could also be applied to the idea of $I_{NC-past}$ having interplay with $I_{NC-present}$.

If moments p_{-1} and p_0 are alleged to contact without coinciding, then it appears that p_0 and p_{-1} cannot contact or abut one another in any way: with respect to contacting (touching) or abutting, they cannot have *anything* to do with one another.

2.2.5 The Impossibility of Moments Interrelating by a Timeless Relation

Some may hold, however, that all accounts of the relation between p_{-1} and p_0 given up to this point are inaccurate, and the correct account of the relation is one where the relation is *not* located among the moments, as has been assumed so far. On such an account, the relation (allegedly) connects the moments but it is *not* located among the Buddhist series of replacing present moments, and thus the relation does not directly attach to, contact, link to, or touch the

moments it interconnects. (This account is much like the Platonist account of relations discussed in Western metaphysics, where properties and relations are held to be not located in time).²⁵ Rather, the relation is somehow outside of time (outside the replacement of presents), and not located in the **R**-time series. This position however does not escape problems.

It is difficult to understand how a continuous (unbroken) and uniform integration or linkage²⁶ might take place at all between the relation (which is not in time) and the interrelated moments (which are temporal since they are moments). It appears that if the relation interrelates moments, then the moments and relation must somehow continuously and uniformly *link* and/or integrate. If there was no such linkage or integration between the relation and the moments, the relation then would not in fact interrelate the items it is supposed to interrelate.

If there *is* such a continuous and uniform linkage or integration enabling the moments to be connected (tied) to the relation whereby the relation can interconnect the moments, then the relation that is outside of time, in touching (linking to, tying to, or integrating with) the moments, must be in time if it is to make contact with, or abut with, any given moment. The timeless relation must “go where” the moments are, and thus must be *at* places in time if the relation is to

²⁵ It is standard in the Western tradition that Platonistic relations are those which are *not* in the spatiotemporal world, whereas non-Platonistic relations are not outside of the spatiotemporal world, as Loux discusses:

What are the issues separating the Aristotelian realists from Platonists? ... Aristotelians typically tell us that to endorse Platonic realism is to deny that properties, kinds, and relations, need to be anchored in the spatiotemporal world. As they see it, the Platonist's universals are ontological “free floaters” with existence conditions that are independent of the concrete world of space and time. But to adopt this conception of universals, Aristotelians insist, is to embrace a two-worlds” ontology... On this view, we have a radical bifurcation of reality, with universals and concrete particulars occupying separate and unrelated realms... [T]here [is a] connection between spatiotemporal objects and beings completely outside of space and time. (Loux, 1995 : 46)

²⁶ “Link” and “nexus” are the words Loux (1998 : 38-40) uses to describe how a relation in fact is attached to the items that are interrelated by it.

link or integrate with moments in order to do the job of interrelating the moments. In order to link to or integrate moments, the timeless relation must *become located* in time, or must somehow be *at a place in time*, if it is to link to or integrate with the moments. But if a timeless relation is in time, the relation involves contradiction and thus is impossible.

But perhaps I am using the word "link" incorrectly here. Some may hold that there is a special *nexus*, *bridge*, or *tie*,²⁷ that is not a relation, and which is a distinct *intermediary* between the relation and the moments, preventing the relation and moments from directly attaching. (Such a bridge or tie is typically called the *exemplification tie*, or the *instantiation relation*, in the contemporary Western tradition.) As mentioned, if the timeless relation is not located in the **R**-series, the moments and the relation must be "bridged", and thus there is an additional item (a bridging item) between the relation and the moments that is responsible for the bridging, and which keeps the relation and moments apart, thus avoiding the problems discussed in the previous paragraph.

I however find this to involve contradiction, for the following reasons. If this bridge is partless, in coinciding with the timeless relation, and the moments, to thereby create a continuous (unbroken) connection between them, the entirety of the bridge is describable as being in time and not in time, which appears to be a contradictory description, and thus the bridge cannot be of this nature. But perhaps the bridge has parts. If so, to give rise to a continuous connection between the timeless relation and the moments, a part of the bridge that is in time would have to contact, interface, attach, abut, or relate to a part of the relation that is not in time. If that is the case, then if there is a continuous connection of the parts of the bridge, the parts must coincide partially or fully, which would mean that, for example, the timeless part would have to be in time, which is impossible. And if there is contact without coincidence between the parts of the bridge, then much like when discussing chronons earlier in this section, the *interfacing* of the parts of the bridge would be describable as being entirely in time and entirely not in time.

²⁷ I am using the words "nexus", "bridge" and "tie" because I am following the account given to us by Loux (1998 : 38-40) where he uses these words.

2.2.6 What About an Exemplification Nexus?

In the last subsection (2.2.5) I discussed how some may attempt to avoid direct contacting of a relation with moments by introducing the idea of a special bridge-like intermediary that ties the moments and the relation that connects the moments. This is what Western analytic metaphysicians have espoused in response to the work of F. H. Bradley, who showed that there may be problems in considering a relation (or property) as being directly in contact with the items that it interrelates. There appear to be significant problems with introducing such a intermediary tie or bridge between a *timeless* relation and moments, but perhaps introducing the tie between relation and moments, where the relation is located where the moments are, can avoid the problems to do with interconnecting moments by a timeless relations, as discussed in the previous subsection.

But on this account, the problems discussed regarding the contacting of, and the relating of, a relation and the moments the relation relates, would be transferred to this special intermediary, for reasons I discuss next. If the relation coincided with the tie, and the tie coincided with the moments, and if the tie is partless, it would apparently involve contradiction, since it would be a single item describable as past and not past, much like how we found when discussing a simple relation relating p_1 and p_0 . Moving to a different example, the discussion above about the problems *relating* of moments by a timeless relation only involved discussion of the contact or abutment of a timeless item and a temporal item. With a special intermediary bridging the timeless relation to the moments, problems much like those described above regarding timeless relations contacting or abutting temporal moments would be found to describe the special intermediary tie. Instead of describing problems to do with the contacting, abutting, or attaching of a timeless relation and moments, which are problems to do with a timeless item and a temporal item contacting or abutting, instead the special intermediary involves these problems: the tie contacts or abuts the timeless relation, and the moment, and thus if it is partless, the entirety of it is describable as being in time and not in time. Other arguments for other positions could be given. No matter what the nature of the connection or contact is between a timeless and temporal entity, the arguments above will ensue if there is any connection of a timeless item and a temporal item, since such a contacting or connecting will

always require an abutment of, or contact of, a timeless and a temporal item, which is apparently impossible for reasons discussed in 2.2.4.²⁸

A B-theorist might imagine that the argumentation about the impossibility of the touching and relating of moments (p_1 and p_0) does not apply to her theory since her B-time does not involve tense (past, present, future). But the above arguments *do* apply to the B-theory, since the above arguments only involved discussion of relations between, or contact and abutment of, two *different moments* (p_1 and p_0), and since B-time also relies on relations between different moments (different times), the arguments above apply to the B-theory also. In other words, the above arguments only involved discussing apparently fatal problems of relations between different times, and it does not matter what those times are called; it is only the case, as Dharmakīrti pointed out, that we if we have different items that are interconnected, we run into apparently fatal problems with those relations.

2.2.7 Other Problems

If there is a causal relation between moments, in addition to the problems listed above, it would also be the case that something exists in addition to the moments: (1) there are moments, and (2) there also are relations between moments. Apparently the relations and the moments must be distinct from one another: moments are not identical to relations. This further illustrates the imaginary nature of non-transcendental causation, since this of course is a violation of Buddhist philosophy of ultimate reality. Dharmottara writes: "(In Buddhism), *since all things are only moments*, the things cannot have any additional outgrowth. Therefore cooperation must be understood as one (momentary) result produced by, (i.e., succeeding to, several instantaneous moments)."²⁹ (Emphasis added.)

2.3 If Moments Do Not Contact or Connect, there is Only One Moment

It appears that the arguments given in this section about the contacting or connecting of moments imply that moments *cannot*

²⁸ I discussed these and some other problems with the exemplification nexus in Grupp, 2003, 2004a, and 2005.

²⁹ Quoted in Stcherbatsky, F. Th., 1962 (1930) : I.129.

contact one another or relate to one another. It appears that Dharmakīrti's position must be espoused: "...in themselves existents are unrelated; it is imagination that relates them."³⁰ The arguments given to this point in this section appear to show that there cannot be a time series, and there can only be a present. But some may object and maintain that there could be a series of distinct moments that are perceived to exist side-by-side, but which are *not* connected or in contact. If this were the case, there may not be just one moment, and thus not just a present, and the **R**-theory need not be the correct account of time. Furthermore, if there is more than just a durationless present, then one could imagine that there could be an object existing at two moments giving rise to some sort of persistence. This account however may have serious problems, for reasons I discuss next.

It is the contact or connections (or *some* sort of interplay) between moments that enables the moments to have associations with one another, and enables the distinct moments to be defined in specific ways, such as being *earlier than* (past), *later than* (future), and *now*, or such as being *next to*, *10 seconds apart*, and so on. But if there is no connection of any sort between distinct moments, nor any contact between distinct moments, and if one attempted to argue for a philosophy of time where there are many distinct moments that co-exist but which are not related to or in contact with one another, then it would be the case that there are no moments that are earlier than any others, later than any others, before or after any others. The ways that moments touch (contact, abut, attach) and/or interrelate are how moments are describable as being distinct from one another. Without such distinctness, moments cannot be different. If distinct moments are not before or after, earlier than or later than, one another, then they all must be present moments: all the distinct moments apparently must be described as *now*. But on such an account there would be multiple non-identical **nows** that co-exist. A **now**, however, cannot be distinct from another now, and a now cannot be at a temporal distance from itself; but if there are multiple distinct **nows**, **now₁** and **now₂**, they would be at a temporal distance from one another, but also not at a distance from one another, which is apparently a contradiction. The way out of this problem is to assert that there is only one moment.

³⁰ *Sambandhaparīkṣā*, verse 5b.

2.4 Why *Replacing* Presents?

One might wonder why there is any need for a *replacing* present. Since the particles that compose reality (molecules, atoms, quarks, gluons, etc.) are perceived by the empirical mind to be constantly in motion, they are constantly changing, and thus are constantly destroyed, where new particles replace them. For these reasons, no two consecutive present moments can ever be alike: due to the constant motion of particles, no two consecutive moments will have the same particle arrangement or particle state, since from one moment to the next quantum particles have new positions. (This will be discussed much more in the next section.) For these reasons, if there is only one moment that ever exists, as was argued in this section, that moment cannot stay itself for longer than a durationless instant: the present moment must go out of existence and be replaced by another present. If a present p changes to p^* ($p \neq p^*$), then since there is only ever one moment that exists, then the one moment that first exists, p , must be completely destroyed, whereby the new present, p^* , comes into existence. If there is only one moment that ever exists, then the only means by which presents can come and go is by a total of present moments.

The conclusions of this section, if correct, are supportive of the Buddhist philosophy of time and the R-theory. If my arguments are correct, it appears to be the case that there cannot be any moments next to (side-by-side) one another in time. If this is the case, there is apparently no way that a non-Buddhist philosopher can attack the Buddhists for possibly espousing theories of time that allow for the persistence and identity of changing objects over time. Furthermore, since to my knowledge, all non-Buddhist theories of time involve impossible contacting and/or connections between moments, or do not involve a replacing present, it appears to be the case that Buddhist R-theory may be a better alternative than the non-Buddhist philosophies of time.

3. Change and Identity Over Time

In this section I will discuss how the philosophies of endurantism and perdurantism have not succeeded in explaining the persistence and identity of objects that change through time. I will argue that this is because it is incorrectly assumed by non-Buddhists that change and identity over time must be described as being devoid

of momentariness. But in reality momentariness may not be a puzzle or problem at all—it may be a correct account of reality.

Specifically, the material in this section will take the form of the following argument:

- (1) Endurantism and perdurantism assume that the doctrine of momentariness is a problem to be solved.
- (2) The science of quantum particles (observing the activities of quantum particles through special instrumentation) may support the **R**-theory.
- (3) Logic appears to support the **R**-theory.
- (4) Endurantists and perdurantists do not yet have anything that resembles a knock-down argument against the doctrine of momentariness.
- (5) The drive to solve the problem of change and identity over time is generated by, and based on, what Loux calls “prephilosophical intuition.”
- (6) The information of science and logic is more trustworthy than the information of prephilosophical intuition.
- (7) The placing of such importance on prephilosophical intuition may be unwarranted since it supports persistence, while logic and quantum science appear to support the **R**-theory (no persistence).
- (8) Therefore, the **R**-theory may be a better theory than the non-Buddhist theories that posit the persistence of objects through time (endurantism and perdurantism), which appear to be against logic and quantum science.

3.1 Persistence and Identity of Changing Objects Through Time

The description of any object changing implies it *cannot* persist:

If an object *m* changes from state *m* to state *m** it can only do so if *m* ceases to exist and *m** comes into existence.³¹

³¹ E.J. Lowe (2002 : 23) describes the problems of change and of identity over time as follows:

Following Western metaphysicians, I will call this “the *problem* of change and identity over time,” which is typically addressed in the philosophies of endurantism and perdurantism in Western philosophy. The analysis of the persistence and identity of changing objects through time is considered a *problem* by non-Buddhists because, as they often admit, it leads to momentariness (and thus to the R-theory of time). *Nearly all* non-Buddhist philosophers reject the idea that anything like the doctrine of momentariness is an accurate account of reality, and the reasons they do is because it is against non-nirvanic, empirical experiences and intuitions about reality—namely, the intuitions that objects persist through time and remain themselves through change. The lure of non-nirvanic awareness is strong enough to blind non-Buddhists from the simplicity and obviousness that the description of the persistence and identity of changing objects through time actually leads to the position that reality is *momentary*.

There has been an *enormous* amount of work put forth by non-Buddhist philosophers attempting to show that objects *do* persist through change and through time *without* momentariness arising. In Western metaphysics, it is in the *endurance* and *perdurantism* debates that philosophers attempt to explain persistence, in an attempt to avoid endorsing that objects have a momentary existence. Non-Buddhist philosophers, such as Western metaphysicians, do occasionally acknowledge that change is a process that has not yet been described coherently. But it is also very often the case that non-Buddhist philosophers assume (or demand) that the persistence and identity of changing objects through time are ultimately *not problems*, due to the belief in, or the alleged verification of, the persistence of objects presented to the empirical non-nirvanic observer. For example, consider how the Western philosopher Michael Loux discusses the philosophies of endurantism and perdurantism as being alleged escapes from the problems of change and identity over time:

...[W]hat is it for a thing—whether a material object or a person—to persist through time? [Western] [m]etaphysicians have given us two different types of answers to this question.

We regularly say that things can change over time, meaning thereby that one and the same thing can be different at different times. But it may seem to be nothing short of a contradiction to say that a thing can be both the same and different, that is, both the same and not the same.

According to one answer, for an object to persist through time is for it to exist whole and entire at each of several different times. On this view, temporal persistence is a matter of strict identity: where something persists through time, a thing existing wholly and completely at one time is numerically identical with a thing existing wholly and completely at another time. The other answer to our question denies that what exists wholly and completely at one time can be literally identical with something existing wholly and completely at another time. On this view... [one and the same] thing persists by having different parts—what are called temporal parts—existing at different times. The first answer to our question is called endurantism; the second, perdurantism (Loux, 2001 : 321).

I will argue that intuitions about, and demands for, persistence of objects through time and change (such as those found in the endurantism and/or perdurantism arguments) may be unsubstantiated, and have *not* put an end to the “problem” of the persistence and identity of changing objects through time (i.e., they have *not* done away with momentariness). The Buddhist **R**-theory of time avoids the *problem* of persistence, since the **R**-theory is free from having to address the question: How there *can be* change *and* identity over time? I will argue in section 3 that this may imply that the **R**-theory may be a better theory of time than its competitors in describing reality.

3.2 Science Supports the **R**-theory

In this section I will argue that science may show that reality is describable by the doctrine of momentariness. This possibility will be significant to my reasoning in later subsections of this section. I want to be clear that I am *not* claiming that science leads to some sort of sure and hard evidence for the **R**-theory of time and the doctrine of momentariness. *Rather*, I am only suggesting that when we look at some of the current findings of science (which of course could be modified or overturned), it appears that they are more in line with the **R**-theory than with the philosophies of persistence. If momentariness is *not* a problem, but conversely is the correct account of reality (i.e., if *m* changes to *m**, then *m* goes out of existence and *m** comes into existence), the doctrine of momentariness and the **R**-theory of time would be a correct account of reality. But this option is typically not

taken seriously, or is just ignored, by non-Buddhist philosophers—such as the contemporary philosophers in the Western tradition. This is because the doctrine of momentariness and the R-theory of time are in disagreement with the empirical belief that objects (seem to) persist through time, as is believed by the non-nirvanic observer engaged in non-nirvanic macroscopic sense perception and the experience of a specious present.

The Buddhist would appear to be justified if she maintained that, at their current level of development, and through their long history, neither endurantism nor perdurantism have evolved to the point where they have succeeded in explaining time and the identity of objects through change *in a way that surely avoids the doctrine of momentariness*. At best, endurantism and perdurantism can only be described as *attempts* to do so. But a Buddhist can merely reply: since endurantism and perdurantism offer no knock-down argument against the doctrine of momentariness and the R-theory of time, the Buddhist can instead consider the seemingly straightforward and simple logical position that if an object *m* changes to *m** then *m* must go out of existence and *m** must come into existence.

Moving from Buddhist logic to science, many hold that the doctrine of momentariness does not disagree with quantum theory (or even the theories of relativity).³² If we consider quantum theory, and if we investigate just how quantum theorists have found particles at the quantum level to “move” about, this may provide evidence for the R-theory of time, and for the doctrine of momentariness. Specifically, when physicists analyze how the particles that make up reality “move,” they find that particles do so by going out of existence at one place, and coming into existence at another. This *quantum jumping*, as it is often called, may indicate that particles have a discontinuous existence. Quantum jumping is most typically discussed in the context of electron orbital jumping (but this is just one of the possibilities). Consider the following passage from Pine:

The science of the subatomic realm is called quantum physics or quantum mechanics. The word “quantum” refers to the fact that energy at the microscopic realm comes in packets, or quanta; energy is said to be “discrete” rather than continuous. The best way of understanding the implications of discrete

³² See Mortensen 2002, section 5. I will give more examples below.

motion is to understand the most famous phrase in this science, the "quantum jump". As we will soon see, this does not refer to a continuous, quick motion of an object, but rather a discontinuous, instantaneous movement from one place to another. In other words, quantum objects seem to be able to move from place to place without being anywhere in between. *They seem to "pop" in and out of existence* (Pine, 1998 : 217-18, n. 1). (Emphasis added.)

Moving away from discussion only of electrons, and focusing on the motion of all particles at the quantum domain, consider an interesting passage from the physicist Nick Herbert:

In the ... world of the quantum, a particle can vanish without a trace (quantum annihilation), or come into existence out of nowhere (quantum creation), move from location A to location B without being in between (quantum tunneling), or instantly flip from one state of being to another (quantum jumping) (Herbert, 1989 : 157).

All quantum measurements when scrutinized at their finest level of resolution consists of tiny particlelike events called "quanta," or "quantum jumps"—*flashes of light on a phosphor screen*, for instance; or a bubble, spark, or click in a particle detector; the blackening of a silver grain in a photographic emulsion; or the sudden excitation of a light-sensitive molecule in your eye. The world when looked at closely appears to be made of little dots, much like color photos in a magazine. The first law of quantum theory is that these quantum jumps occur completely at random—no theory, quantum or otherwise, can predict where or when the next light-induced flash will occur in your retina (Herbert, 1989 : 160). (Emphasis added.)

Herbert's passage implies that observations of quantum particles are observations of apparently short-lived or instantaneous, and apparently stationary, flashes, dots, and smears of quantum energy. It does not appear that Herbert's passage suggests that quantum items exist continually, persisting through a measurable duration, moving about in a familiar macroscopic-like way, first existing at position *x* and then enduring through time so as to travel (move) to *y* through space and time without being momentary.

If physicists are giving an accurate description of quantum reality, I will explain in a few places below that their research could give evidence for all of reality being momentary. If it is the case that quantum theories describe the fundamental level of reality, and if particles are momentary, and if all of reality is composed of momentary quantum particles, then all of reality is momentary. The reasoning just given can be put in the following syllogism:

Macroscopic reality is composed of quantum particles.

Quantum particles obey the doctrine of momentariness.

Therefore, macroscopic reality obeys the doctrine of momentariness.

If this syllogism is not in error, it would indicate that quantum physics supports the doctrine of momentariness. I will discuss objections to this syllogism in 3.4.

3.3 Non-Buddhist Philosophy of Time is Based on “Prephilosophic Intuition”

In this section I will discuss how non-Buddhists typically deny the doctrine of momentariness by following pre-logical and unscientific *intuition* that is not in accord with the guidance of scientific and logical evidence I will also find that by asserting that their intuition *is* to be trusted, they are, perhaps inadvertently, *rejecting* basic findings of logic and science. What I specifically mean by “intuition” can be clarified if I give passages from Loux and Merricks, who are each widely discussed Western metaphysicians. These passages also show how endurantism and perdurantism—the areas of Western metaphysics that consist of attempts to describe the persistence and identity of changing objects through time in a way that *avoids* momentariness—are fields that have been created out of the *intuitions* and *beliefs* about the non-momentariness of objects found in non-nirvanic psychology.

[Arguments against the endurantist show that] the endurantist is unable to give a satisfactory account of any case where an object undergoes a change in one of its accidental, but nonrelational properties. The claim is that an endurantist account of change requires us to reject a principle that none of us [i.e., Western metaphysicians] wants to reject, the Indiscernibility of Identicals... [which] is the claim that necessarily if an object, *a*, and an object, *b*, are numerically

identical, then every property of *a* is a property of *b* and vice versa... ..[S]ince the one has and the other lacks one and the same property, we have a violation of the Indiscernibility of Identicals; or so the perdurantist claims. The perdurantist, however, adds that on a temporal parts account of persistence, everything falls into place. On that view, *x-at-t* and *x-at-t'* are numerically different objects, so there is no violation of the Indiscernibility of Identicals; but *x-at-t* and *x-at-t'* are temporal parts of one and the same four dimensional whole, *x*, so we have the persistence our *prephilosophic intuitions call for* (Loux, 2001 : 324). (Emphasis added.)

Now consider what Merricks writes about endurantism versus perdurantism:

Objects persist. Objects last over time. The computer I use today is the same computer I used yesterday. Some [non-Buddhist] philosophers think objects last over time by having temporal parts. According to such philosophers, any three-dimensional thing one sees at one time is not the same three-dimensional thing one sees at the next; rather, each three-dimensional thing is a momentarily existing entity... An enduring object is usually defined as one that is "wholly present" at each time at which it exists... The endurantist is committed to [the identity of an object if it changes through time]... Therefore, the critic of endurance claims, endurance combined with change results in contradiction.

The seriousness of the problem can be seen by noting that it would arise even if, as a matter of contingent fact, persisting objects did not undergo change—because it seems that endurance, combined with the indiscernibility of identicals, makes change of persisting objects impossible. *But surely it is possible that persisting objects change.* This is the problem of indiscernibility and change over time (Merricks, 2001 : 353-354). (Emphasis added.)

The point of citing these passages is to give examples of the way that non-Buddhist philosophers commonly reject that change involves momentariness without presenting any sort of argument or evidence. They are apparently eager enough to reject momentariness that they appear comfortable in basing their theorization on *intuition* and *belief*, rather than on *philosophy*, *logic* or *science*. If there is any

intuition found in science or logic, it is traditionally held to be less important and less valuable than experimentation (and theory based on experimentation) in the case of science, and logical evidence in the case of philosophy. The reason for this is because science and logic have usually proven to be a much more successful means of describing reality than intuition is. (I will give examples below.) As shown in the passages above, Western analytic philosophers often discuss trusting their empirical intuitions as if there is no need to question our intuitions. In response to what has just been written, I imagine empirically oriented philosophers may demand: "But I just see the object right there, enduring through time! How can that be incorrect?" In 2.2.1 above, I discussed reasons why this cannot be what the empirically-oriented observer in fact observes. Empirical consciousness only does its observing in a *now* (in the present)—and surely *seems* to be able to verify that the object is enduring through time, right there in front of her eyes—but if that is the case then empirical observation is however only a series of replaced *present* empirical states of consciousness, replacing at a rate faster than the empirical awareness can discern. Thus there is no reason to believe that the experience of the empirically-oriented philosophers is an experience that correctly indicates what reality is like.

Despite what many empirically oriented philosophers, many others, such as many quantum physicists and many non-Western philosophers do not share in this trust, given the evidence against the reliability of the information of our intuition, and of our macroscopic sense information. As just mentioned, Buddhists typically fall under this variety of philosopher, as Dreyfus discusses, in a passage about Dignāga and Dharmakīrti:

Our ordinary attitude assumes that existence and reality are given to our intuition and refuses to differentiate between what is more and less real. Dignāga and Dharmakīrti are not satisfied with this attitude, for to give all phenomena equal ontological status leads to the undesirable multiplication and reification of entities. Accordingly, one of the important tasks of the philosopher is to distinguish what to accept as real, in the full sense of the word, and what to consider as conceptually constructed (Dreyfus, 1997 : 48).

It may appear safe to many to trust the appearances presented to the ordinary (empirical, non-nirvanic) consciousness, such as persistence, the spatial extension of objects, and so on. It may appear

to some that, yes, science and logic can occasionally go against our intuitions, but some issues, such as persistence and spatial extension, are too commonsensical and obvious to ever be shown to be mere errors of the mind. But even the actuality of such seemingly ordinary perceptual objects, such as color, surface, distance, and continuous (non-momentary) motion—items *basic* to ordinary, empirical, non-nirvanic, macroscopic perception, and which may appear to be entirely commonsensical, intuitive, prephilosophical aspects of human understanding that are beyond question—are in fact drawn into serious question by the experimental and mathematical findings of physicists³³ (and the logical findings of Buddhists³⁴). The point

³³ For a discussion on many of these issues to do with the opposition quantum physics has with the concepts of space, time, distance, and motion, see Quentin Smith (2003). Also, consider a passage from Greene, a famous physicist, on the nature of ultimate reality in physics:

...[R]esearch on aspects of M-theory... has shown that something known as a *zero-brane*—possibly the most fundamental ingredient of M-theory, an object that behaves somewhat like a point particle at large distances but has drastically different properties at short ones—may give us a glimpse of the spaceless and timeless realm... [W]hereas strings show us that conventional notions of space cease to have relevance below the Planck scale, the *zero-branes* give essentially the same conclusion but also provide a tiny window on the new unconventional framework that takes over. Studies with these branes indicate that ordinary geometry is replaced by something known as *noncommutative geometry*... In this geometrical framework, the conventional notions of space and of distance between points melt away, leaving us in a vastly different conceptual landscape. (Greene, 1999 : 379)

If the quantum level makes up the macroscopic level, it is difficult to understand how the macroscopic (empirical) level can emerge out of the quantum level (I will discuss issues similar to this much more in the next subsection). But that is only a problem if one trusts the information of their empirically-oriented senses.

³⁴ Stcherbatsky discusses logical implications of the doctrine of momentariness:

The sensible world consists of *sensibilia* which are but momentary flashes of energy. The perdurable, eternal, pervasive Matter which is imagined as their support or substratum is a fiction of the Sāṃkyas and other schools. All things without exception are nothing but ... momentary events... By proving this our fundamental thesis alone, we

here to suggest if intuition is not guided by the findings of philosophy and science, then such intuition may be little more than a means of *knowing reality as it is not*. If so, the non-Buddhist endurantists and perdurantists are basing their claims on non-logical, non-scientific evidence—or, as Loux puts it, *prephilosophical intuition*.

Logic appears quite simply to lead to the position that if *m* changes to *m**, then it can only do so according to the doctrine of momentariness. But the non-Buddhist does not see matters this way, given that (non-nirvanic) prephilosophical intuition typically is willing to go against the logic of the doctrine of momentariness. Consider how David Lewis, a very well-known Western philosopher, presents his case in an article against presentism, and thus against momentariness; notice how his position is only based on belief (intuition), and no argumentation is given: “[Presentism] rejects endurance... rejects persistence... [and goes] against what we all believe... No man, unless it be at the moment of his execution, believes that he has no future; still less does anyone believe that he has no past” (Lewis, 1998 : 206). (Emphasis added.) It seems that Lewis’s use of the word “belief” is very similar to the “prephilosophic intuition” described by Loux.

Prephilosophic intuitions are widely known for their capacity to mislead the intuitions. For example, when I was young child, I had the belief and intuition that the sun was a ball that literally moved (floated) across the sky repetitiously day-after-day while the earth remains stationary. Was I irrational for this? From the perspective of intuition and belief, perhaps *not*. My prephilosophical (and pre-scientific) sense information indicated to me that the sun *was* floating across the sky. Only later did I find out that my intuitions about my immediate sense information were entirely incorrect and it was just the opposite that was the case: the sun is (more-or-less) stationary

could have repudiated at one single stroke... the God (of the theists), the eternal Matter (of the Sāṃkyhas) and all the wealth of (metaphysical) entities imagined by our opponents. To examine them one by one, and to compose elaborate refutation at great length was a perfectly useless trouble, since the same could have been done quite easily.. Indeed, not one of our opponents will admit that these entities are instantaneous, that they disappear as soon as they appear, that their essence is to disappear without leaving any trace behind. (Stcherbatsky 1962 (1930) Vol. 1 : 79-80.)

with respect being at the center of the solar system, and the earth is moving around *it*.

This example can perhaps serve as an analogy to what might be behind most or all prephilosophic intuitions. What I am suggesting is that it could be the case that our prephilosophic intuition is in general incorrect. Consider the following argument, which makes use of the syllogism about quantum reality that I presented in 3.2:

1. Prephilosophic intuition is in line with non-nirvanic psychology.
2. Non-nirvanic psychology is unaware of momentariness.
3. Quantum reality apparently shows that reality is momentary.
4. Logic (and Buddhist logic) apparently shows that if there is change, then reality is momentary
5. Prephilosophic intuition is in contradiction to quantum theory and to logic.

Conclusion : Therefore, prephilosophic intuition is an incorrect account of reality since it is unaware of the momentary nature of reality.

Regardless of what the non-nirvanic psyche believes reality to be like, if the argument just given is correct, then reality is not describable by our prephilosophic intuitions.

The non-nirvanic psyche gives much credit to its macroscopic worldview, despite that fact that simple science and logic show that view to be in error. It is interesting to note that Western metaphysicians, despite not being able to describe change or identity through time, nevertheless typically assert that there *is* identity through time, and changing objects *do* in fact endure or perdure. A passage from Loux appears to clearly reveal the unabashed bias that the non-nirvanic psychology has toward prephilosophic intuition:

Except for the occasional sceptic, *we all believe that things persist through time*. We think that the familiar objects and persons with which we interact on a regular basis persist from day to day. I *believe* that the chair on which I am sitting is the same chair on which I say yesterday and that the man who brings me today's mail is the same person who delivered yesterday's mail; and I *believe* that the same is true of myself. Indeed, it almost seems misleading to say that I *believe* that I

persist through time. The claim strikes us as too guarded; it seems to suggest that I might be in some doubt about my persistence through time. The fact is, however, that the proposition that I—this very person—existed yesterday and the day before that and the day before that is about as certain to me as any proposition (Loux, 2001 : 321). (Emphasis added.)

Although somewhat rarely, Western philosophers do occasionally release their grip on the endurantism and perdurantism debate and bring up the doctrine of momentariness (though they typically do not use the phrase “doctrine of momentariness”) as a possible way to explain time and change. But, unsurprisingly, Western metaphysicians also typically discuss the doctrine of momentariness in order to merely reject it without any arguments as to why they reject it, relying only on an appeal to prephilosophic intuition about objects. For example, consider how E.J. Lowe, a widely discussed Western metaphysician, analyzes the doctrine of momentariness (he calls it “intermittent existence”):

A further question which [my] discussion [of change and identity over time] provokes is whether it is possible for a composite thing, such as a ship, to enjoy an *intermittent* or *interrupted* existence. In an ordinary case of disassembly and later reassembly—as when a tent is taken down and later erected again, or a watch is taken to pieces for cleaning and later put back together again—it seems that we have two options when asked what happens to the composite object concerned. We could say that it goes on existing in a disassembled state, or we could say that it temporarily ceases to exist until it is reassembled (Lowe, 2002 : 33).

Lowe raises the issue of “interrupted existence,” but then in the next lines, and resorting to prephilosophic intuition, he does not endorse the theory of interrupted existence. Rather, in trusting his prephilosophic intuition (i.e., by trusting non-nirvanic psychology), Lowe gives an unargued *opinion* which is intended to bring the reader against the doctrine of momentariness and to the non-logical, non-scientific assumption of a non-momentary reality:

I think it improbable that we should, in fact, never have need to speak in this way [to speak of objects as having what he calls intermittent existence]. So my *tentative verdict* is that no

composite object whatever enjoys a merely intermittent existence—but I concede that my *opinion* in this matter is controversial (Lowe, 2002 : 34). (Emphasis added.)

Lowe refers to his conclusion as a “tentative verdict”, but the word “verdict” implies that there is *evidence* that brings one to a decision on an issue, as in a court case. But there is no evidence presented here by Lowe. In the end, what it appears Lowe has done is raise the issue of “intermittent existence” and then assert (if I may paraphrase): “I don’t think we have to endorse intermittent existence; case closed.” This however is not a verdict, but an opinion devoid of reasonable evidence—perhaps on the level of what Wittgenstein referred to as religion: *to argue without evidence or argumentation*.

Some Western philosophers have more seriously entertained the idea of an **R**-theory of time. Consider a passage by Jubien, where he entertains the idea that time involves the momentariness of, and the *replacing* of, images in one’s mind due to the momentariness of reality:

[S]uppose R is a region of space that is fully occupied by stuff at the instant t and also at the instant t^* , later than t . Do we automatically have two entities [or two blobs of stuff] in such a case? Many philosophers hold that the answer is no, claiming that “stuff can persist through time”... But others claim the opposite. On the former view, time is like a river that is flowing past objects, which the result that the same object exists at different times. On the latter view, the passage of time is better represented by a movie, with the images on the screen playing the role of physical objects in the world. In a movie, new images keep appearing and *replacing* others, which then cease to exist. This is true even in a film of totally motionless and unchanging objects. So on this view, the stuff that comprises the universe is continuously being *replaced* by brand new stuff, sometimes indistinguishable from the stuff it replaces (Jubien, 1997 : 157). (Emphasis mine.)

Although Jubien writes as if the doctrine of momentariness is one of the theories espoused by Western philosophers of time, to my knowledge, an **R**-theory of time with a replacing present has never been a major position in Western philosophy or in any non-Buddhist philosophy of time (except perhaps for the ancient Greek Cyrenaics, as mentioned in endnote 5, but which have been largely forgotten in

the Western tradition). It is the Indian Buddhists who have long endorsed the logic of momentariness, and for that reason the R-theory should be considered the *Buddhist* theory of time.

For reasons discussed in this subsection, it appears one may be able to discard the information about the non-momentariness of reality presented by the prephilosophic intuition, since it may be the case that logic and science support the R-theory of time and the doctrine of momentariness.

3.4 Objections to the Syllogism: Anti-Reductionism

Some may object to the syllogism given in 3.2. In this section I will discuss two objections to it.

Some may assert that the syllogism appears to arrive at a *reductionistic* conclusion. Reductionism can be defined as: object x can be shown to consist of nothing but more fundamental objects that make up x .

It is not my goal to take a side in the reductionism versus anti-reductionism debate. It is debatable whether or not the syllogism is in fact reductionistic, but in this subsection I will argue that it does not matter if the syllogism is reductionist or not. This is because regardless of whether or not reductionism or anti-reductionism is correct, in either case the syllogism appears to be successful: even if macroscopic reality is not reducible to quantum reality, quantum reality's apparent momentariness nevertheless indicates that macroscopic reality must be momentary. If that is the case, then whether reductionism, or anti-reductionism is correct, it appears that in both cases the syllogism does involve an inference from the premises to the conclusion.

If reductionism is a correct philosophy, it is obvious that it does not harm the syllogism. So what needs to be discussed is whether the syllogism is successful if reductionism is *incorrect*, and where any micro- or macroscopic composite object, or all of reality, need not *only* be described in terms of their quantum parts. I will argue that if anti-reductionism is the correct account, macroscopic objects can apparently only be momentary on either account, and thus the syllogism is vindicated.

If anti-reductionism is correct, no macroscopic item can be explained only in terms of its quantum particles: macroscopic reality is non-momentary, even though it is composed of momentary

quantum particles. Consider a lion, L_1 , where L_1 is not reducible to its constitutive momentary quantum particles. The anti-reductionist holds that L_1 is *emergent on*³⁵ a constitutive momentary quantum particle assemblage, q_1 , at moment t_1 , but L_1 is not reducible to q_1 . If it were the case that quantum reality consists of momentary particles, then from moments t_1 to t_2 , the constitutive momentary quantum particle assemblage q_1 is replaced by a new constitutive momentary quantum particle assemblage, q_2 , at t_2 . This indicates that L_1 , which is emergent on q_1 , may not exist at moment t_2 , since the constitutive momentary quantum particle assemblage q_1 does not exist at t_2 and has been replaced by q_2 . If q_2 composes L_2 , but not L_1 , then regardless of whether or not L_1 and L_2 are fully explainable in terms of their constitutive momentary quantum particle assemblages, since L_1 and L_2 are partially explainable in terms of their constitutive momentary particles, then from t_1 to t_2 the particle bases are different, and L_1 and L_2 are describable as being different in at least that one respect. If they are partially different (i.e., if at least one aspect of L_1 does not persist into L_2), then they are not identical, and L_1 cannot be the same as L_2 (L_1 and L_2 are momentary). If L_1 and L_2 are not identical, it is because their constitutive momentary quantum particle assemblages have been replaced, and thus the syllogism from subsection 3.2 appears sound. Regardless of whether L_1 is or is not reducible to its constitutive momentary quantum particle assemblage, if the constitutive momentary quantum particle assemblage is replaced at t_2 , then it appears that L_1 would have to be replaced by L_2 .

³⁵ "Emergentism" is a word typically associated with the reductionism/anti-reductionism debate. Stephan (2002 : 78) writes:

The different varieties of emergentism are covered more or less by three theories deserving particular interest: *synchronic* emergentism, *diachronic* emergentism, and a *weak* version of emergentism. For synchronic emergentism the relationship between a system's property and the system's microstructure, i.e., the arrangement and the properties of the system's parts, is in the center of interest. For such a theory, a property of a system is taken to be emergent only if it is *irreducible* or, what I take to be the same, if it is *not* reductively explainable.

In this case, the properties *solidity, being a lion, golden, being non-momentary, being a mereological whole*, are those which compose L_1 and which are emergent on q_1 .

The motion, and the apparent momentariness, of quantum particles makes macroscopic reality momentary, even if anti-reductionism is correct.

Some may object to the reasoning given in the previous paragraph for this reason: it does not matter what the constitutive momentary quantum particle assemblages (q_1 and q_2) are doing, because L_1 , in being *emergent on* q_1 , can be treated as distinct from, separate from, q_1 , and if L_1 is distinct from q_1 , it is not clear why L_1 must be replaced if q_1 is replaced. In other words, why can't the replaced constitutive momentary quantum particle assemblage (q_2), and the first constitutive momentary quantum particle assemblage (q_1), *both* give rise to L_1 , whereby L_1 would persist from t_1 to t_2 , even though L_1 consists of distinct quantum particles from t_1 to t_2 ? On this account, the anti-reductionist could assert that the constitutive momentary quantum particle assemblages that compose L_1 , described by discontinuous quantum jumping and momentariness, do not change the fact that we can see with our non-nirvanic sense perception that L_1 persists from t_1 to t_2 , and such sense experience is enough to ascertain that L_1 stays itself from t_1 to t_2 , regardless of whether or not the constitutive momentary quantum particle assemblages making up L_1 are momentary.

There appears however to be a few problems with this account. Firstly, our ordinary non-nirvanic understanding of reality does not indicate that L_1 is unchanging from any one moment to the next, but rather it indicates that L_1 is changing from any one moment to the following moment. This is because there will always be an aspect of the lion (the lion as emergent upon the quantum particles) that is not the same from one moment to the next. For example, the organization of mental states going through the lion's mind and/or brain are likely fast-paced as, for example, it scans a landscape and images are replaced at an extremely fast rate, and thus it is hard to imagine that the lion's mind is ever identical from one moment to the next. As another example, consider the flow of blood through the lion's body; it is hard to imagine, since it is productively flowing every second of the lion's life, that there are ever two instants where the blood is in the same state from one instant to the next—how can there be a perpetual flow of something (of blood) that is not perpetually moving and thus perpetually changing? Other examples are easy to find. The heartbeat of the lion is continual change. On a breezy day, the fur of

the lion may be perpetually moving in the wind. As a lion walks, or performs any bodily action, such as moving a limb, the lion is not the same from any one moment to the next, since such motions are continuous motions, meaning the limb or body-part in question is always in a different position from one durationless instant to the next. For reasons just given, it is hard to imagine how or why one could assume that the emergent lion, L_1 , is ever an unchanging entity from one moment to the next, or the same item from one moment to the next.

Secondly, in section 2 of this article I found that moments apparently cannot contact or interconnect in any way. If my argumentation is correct, then it seems that since there is a discontinuity and an unconnectedness between q_1 and q_2 , then even if it is asserted that L_1 is emergent upon *both* q_1 and q_2 , there also must be a unconnectedness and/or discontinuity between L_1 at t_1 and t_2 . Therefore, even if one asserts that L_1 which is emergent on q_1 , is identical to L_1 which is emergent on q_2 , it appears that there is an unconnectedness and/or discontinuity between L_1 at t_1 and L_1 at t_2 . But if there is an unconnectedness and/or discontinuity between L_1 at t_1 and L_1 at t_2 , then for reasons I will discuss next, it appears that the following equation must be true:

$$L_1 \text{ at } t_1 \neq L_1 \text{ at } t_2.$$

If L_1 at t_1 is emergent on q_1 , then L_1 at t_1 is describable by the statement,

“is emergent on q_1 .”

If L_1 at t_2 is emergent on q_2 , then L_1 at t_2 is describable by the statement,

“is emergent on q_2 .”

The first statement is different from the second,

“is emergent on q_1 ” \neq “is emergent on q_2 .”

But if these statements that describe L_1 *differ*, then the descriptions of the L_1 s differ. And for that reason, L_1 at $t_1 \neq L_1$ at t_2 , and lion L_1 must be momentary if the constitutive quantum particles composing the lion replace from t_1 to t_2 .

On a similar note, one might assert that the first statement of the syllogism at the end of 3.2 (“Macroscopic reality is composed of quantum particles”) involves the following composition fallacy: the *parts* (quantum particles) of the macroscopic object (such as a lion) have the attribute of momentariness, but it is incorrect to maintain that the *whole* (lion) has the attribute of momentariness. Stated differently, a composition fallacy would be committed if the parts of an object have some property **I** (**I**=impermanence), but it would not follow that the whole also has property **I**. This objection is similar to the anti-reductionist objection discussed above. Above I found that even if anti-reductionism is correct, it appears to be the case that a momentary quantum particle assemblage cannot give rise to a non-momentary object composed of the momentary quantum particles lion. If my reasoning is correct, then property **I** is ascribable to both whole and parts—to both particles and lion.

3.5 Conclusion

In this section I have found that endurantism and perdurantism are based on intuitions and beliefs, and are not based on scientific evidence, nor on the evidence of logic. I maintain that intuition and belief do not present the evidence needed to assert that the momentariness of the **R**-theory is incorrect, nor that the non-Buddhist philosophies of time are more robust than the **R**-theory of time. Conversely, the problem of persistence appears to be a problem not only because it is against the simple logic of momentariness (if any object changes it cannot stay identical to itself through change), but because persistence may not be supported by quantum science. If my reasoning in this section is correct, the **R**-theory of time appears to be a better alternative than the non-Buddhist philosophies of time, such as endurantism and perdurantism, since the non-Buddhist philosophies of time typically involve the non-logical and pre-scientific *belief* that there is persistence of objects and selves through a duration.

4. Metaphysical Realist Objections

Some might wonder why an *entire* object must go out of existence when it changes. For example, and from the perspective of the empirical mind, when a lion changes by losing one hair of its mane, why is it the case that the entire lion goes out of existence at t_1 whereby a copy of an entire new lion comes into being at t_2 ? Why can't, for example, just *one* or a few properties of the lion alter or just

one or a few pieces of the lion alter, where the rest of the object persists, and accordingly the *entire* lion does not vanish out of existence? These questions were addressed above when I discussed how the lion is composed of quantum particles: it is an illusion that, for example, when the lion loses a single hair, only that aspect of the lion changes, and the legs, tail, and abdomen of the lion remain unchanged, since in reality all of the lion is composed of particles in motion (moving according to quantum jumpiness), and thus all fundamental particles making up the lion are momentary, regardless of what the macroscopically oriented empirical mind believes to be the case about reality.

While it seems this does answer the question of why the *entire* object replaces, I will however ignore this reasoning, which is based on quantum theory, in order to discuss how Western metaphysicians have attempted to explain objects as persisting through time, where only a few pieces and/or properties of an object (such as a lion) are momentary, rather than it being the case that the entirety of the object in question is momentary. I will show, however, that the Western accounts of the (alleged) persistence of changing objects apparently *cannot* be an account of how objects change without resorting to the **R**-theory of time. The issues brought up in this section have to do with the Western account of *metaphysical realism*,³⁶ which is very similar to the Nyāya account of realism.³⁷

³⁶ In the *Cambridge Dictionary of Philosophy* (Cambridge University Press, 1995, pp. 562-63), Butchvarov describes what is meant by "metaphysical realism":

Metaphysical realism, in the widest sense, [is] the view that (a) there are real objects (usually the view is concerned with spatiotemporal objects), (b) they exist independently of our experience or our knowledge of them, and (c) they have properties that enter into relations independently of the concepts which we understand them or of the language with which we describe them. *Anti-realism* is any view that rejects one or more of these theses, though if (a) is rejected the rejection of (b) and (c) follows trivially...

In discussion of universals [properties], metaphysical realism is the view that there are universals...

³⁷ See Dreyfus (1997 : 53-58, esp. p. 57). This passages shows how closely aligned Western metaphysical realism is aligned with the realism of the Nyāya.

Consider the lion changing through time when it loses a single hair. For simplicity, consider that lion **L** is describable in terms of three properties, **S**, **B**, **H**, but **L** changes to **L***, where **L*** is describable in terms of **S**, **B**, **M**, rather than **S**, **B**, **H**:

$$\mathbf{L} = [\mathbf{S}, \mathbf{B}, \mathbf{H}]$$

$$\mathbf{L}^* = [\mathbf{S}, \mathbf{B}, \mathbf{M}],$$

L's properties are **S**=sleeping, **B**=breathing, **H**=has hair h_1 , and **L***'s properties are **S**=sleeping, **B**=breathing, **M**=missing hair h_1 . On this account, **S** and **B** seem to have persisted, but **M** replaces **H**. **L** \neq **L*** since $[\mathbf{S}, \mathbf{B}, \mathbf{H}] \neq [\mathbf{S}, \mathbf{B}, \mathbf{M}]$. But since **S** and **B** may have persisted, why then do we need to hold that *all* of **L** vanishes? Shouldn't it be the case that just **H** vanishes? If that were the case, then one might attempt to hold that **L** \neq **L*** is not correct, since not all of **L** has vanished. But one might assert that instead of **L** \neq **L***, according to this objection, the correct account would be:

When **m** changes to **L***, some of **L** vanishes, and some of **L** endures to **L***.

Making use of the *approximately equal* sign, one might put the matter this way:

$$\mathbf{L} \approx \mathbf{L}^*$$

According to this objection, rather than holding that **L** \neq **L***, one should espouse that **L** is partly equal to **L*** since **S** and **B** do not vanish out of existence, and it is only **H** that is momentary.

This objection may be similar to one that Western metaphysical realists have in mind. On one popular metaphysical realist account, it is held that objects, such as a lion, *have* properties, where two items are being considered: (i) the item that *has* properties, and (ii) the properties that are possessed by that item. Hereafter I will call the property possessor the *bare particular*. On the Western metaphysical realist account, the properties and the bare particular are all typically considered in a realist context (they are not idealist entities since they are assumed to be separate from the mind), and the

bare particular—the property possessor—is typically considered distinct from the properties.³⁸

On this account, the properties may come and go, but the thing in itself, the bare particular, the holder of the properties, apparently

³⁸ In this section I am going to attack the Western bare particular theorist's account of a persisting bare property possessor. But this might lead some to wonder if there is another alternative offered in the West, in addition to realist bare particular theory. There in fact is a second position—the philosophy of thick particulars, where property possessors are not bare:

On the non-bundle substance [i.e., thick particular] account, since... there must be two distinct items involved in property possession (a *property* tied to a *particular* that is entirely distinct from the property), there must be a specific entity that the... tie is... attachment with... I consider this a rather simple inquiry to make, for one reason: *any of the first-order... properties of a non-bundled substance must attach to some entity, but if they attached to each other, the substance would be a bundle, thus first-order properties must attach to a non-property.* (This issue, which is integral in my theorization in this article, has been ignored by metaphysical realists.) If a substance is not a bundle, there must be something about the non-bundle substance that is *not a property*, and it is that “something” that the first order properties attach to (via the exemplification tie).

Many metaphysicians who are non-bundle substance theorists tell us that non-bundle substances do not involve a bare particular. They tell us that we “cannot get below the concept of a concrete particular”... On the Armstrongian [i.e., thick particular] account of non-bundle substances,³⁸ some Aristotelian accounts of non-bundle substances, and platonistic accounts of non-bundle substances, properties are widely held to be properties of *thick* particulars,... as when we say: “the lion (thick particular) is sublime (property)”,... since “lion” may appear to refer to a complex of properties, and not just to the non-property entity that properties tie to. (Grupp forthcoming-a, section 2.3.)

I only discuss this account in this footnote, rather than in the main text, since it seems, to my knowledge, that the bare particular position is discussed much more often in philosophy in general than the thick particular model, and the thick particular model is only discussed by very specialized analytic metaphysicians. Also, I feel that the argumentation give in the passage from my forthcoming paper shows that the philosophy of thick particulars is not as clear as the perhaps more straightforward bare particular account.

need not alter at all. If this were the case, metaphysicians in the Western tradition could assert that it is not the entirety of a changing object that vanishes out of existence, but rather just one or some number of properties of the object that go out of existence. For these reasons, some metaphysicians in the Western tradition may believe that the problems of change and of identity over time are avoided by holding that only the *properties* tied to the bare particular come and go, but the bare particular, which is distinct from the properties, can remain changeless. Oaklander, in discussing the possibility of this position, puts it as follows:

It sounds paradoxical when you say “Change involves the tomato being what it is and being what it is not,” but the air of paradox disappears once we distinguish the thing or substance, the tomato, from its properties. If a thing changes, then obviously it is not qualitatively identical with what it was because it has different properties or qualities from those it previously had. But even through it is qualitatively different it may still be numerically the same thing that undergoes change (Oaklander, 1995 : 58).

On the Western bare particular account, properties *are not tied to one another, but rather are tied to an entity that is a non-property*. The non-property item is the bare particular that properties tie to. It has also been called a *thin particular*, or an *internally bare particular*.³⁹ Armstrong discusses what is meant by “internally bare particular”, or “thin particular”:

Here is a problem that has been raised by John Quilter (1985). He calls it the “Antinomy of Bare Particulars.” Suppose that particular *a* instantiates property *F*. *a* is *F*... *a* and *F* are different entities, one being a particular, the other a universal. The ‘is’ we are dealing with is the ‘is’ of instantiation—of the

³⁹ If the properties of the non-bundle substance were not tied to a non-property that is a hold of properties (a bare particular), then they would be tied to a property, and the substance would be what realists in the West call a *bundle*. So on the non-bundle account, the properties must be held by a non-property. I do not discuss position in this article due to length considerations. Also, the bundle theory is already under attack by many Western analytic metaphysicians regarding its not being able to account for persistence. There are other problems with the Bundle theory as well. (See Grupp, 2004b.)

(*internally* propertyless⁴²), then this internal nature is itself a propertyless item. If this is the case, then the internal nature cannot change since change (and momentariness) is describable in terms of properties. In other words, the reasoning of the previous section may appear to have problems since it discusses bare particulars as changing, but bare particulars cannot since a propertyless item has no reason for alteration of any sort. So the tying of the bare particular to the property via the exemplification tie cannot in fact show that there is a momentary bare particular, as indicated in the previous section. Instead it seems that the bare particular is not momentary, and rather only the exemplification ties and properties are.⁴³

The metaphysical realist holds that properties that are tied to the bare particular can alter. "Tying" denotes what the exemplification tie does with the bare particulars. But if the *exemplification* of properties alters, then the exemplification of properties of the bare particular at t_1 is not the same as that at t_2 . If the

⁴² Moreland, a major contemporary Western bare particular theorist, discusses the propertyless nature of the bare particular:

Advocates of bare particulars distinguish two different senses of being 'bare' along with two different ways something can have a property. In one sense, an entity is bare if and only if it has no properties in any sense. There is another sense of 'bare', however, that is true of bare particulars. To understand this, consider the way a classic Aristotelian substance has a property, say, some dog Fido's being brown. On this view, [unlike a bare particular,] Fido is a substance constituted by an essence which contains a diversity of capacities internal to the being of Fido. These capacities are potentialities to exemplify properties or to have parts that exemplify properties... When a substance has a property, that property is 'seated within' and, thus, an expression of the 'inner nature' of the substance itself...

By contrast, bare particulars are simple and properties are linked or tied to them. This tie is asymmetrical in that some bare particular x has a property F and F is had by x . A bare particular is called 'bare', not because it comes without properties, but in order to distinguish it from other particulars like substances and to distinguish the way it has a property (F is tie to x) from the way, say, a substance has a property (F is *rooted within* x). Because bare particulars are simples, there is no internal differentiation within one of them. (Moreland, 2003 : 3-4.)

⁴³ I am grateful to Jessica Deal of Grand Valley State University for posing this objection.

tie of properties alters, then the interplay between bare particular with the *tying* of properties also alters. So it seems that the metaphysical realist must assert that the bare particular is changing since it has different “interactions” with different exemplification ties at different times, and if the interaction that the bare particular has changes, then the bare particular changes. It seems that the metaphysical realist would likely assert that this cannot happen since it makes no sense to say the propertyless bare particular changes, since being devoid of properties and parts, the bare particular cannot be describable as changing, and thus as being momentary. However, if property exemplification is not identical from one moment to the next, the bare particular cannot be described as being the same from one moment to the next, and thus it must be momentary.

5. Conclusion

5.1 Conclusion Part 1: Buddhist Atomism (Abstract Atomism)

One might wonder: *Why* do presents have to replace? In other words, why is there any motion at all? Motion leads to the constant change and replacing of present moments, but what is the reason that *replacing* occurs? In this last part of this article, I will discuss *why* there is motion: *why* Buddhist ultimate reality can only be composed of atoms that are in motion—i.e., why Buddhist ultimate reality is composed of *replacing* basic building blocks (Buddhist atoms). I will attempt to give an answer to why there is motion (replacing), and I will argue that it is a mere outcome of the nature of Buddhist atomism that there is replacement involving the atoms that compose ultimate reality.

Buddhist atoms are non-concrete atoms of energy. I also call them *abstract atoms*, where the word “abstract” is meant to give emphasis to the abstruse, perhaps even immaterial or non-concrete nature of the ultimate “stuff” (atoms) that makes of reality. Buddhism is also often considered to be atomistic (especially in Indian Buddhism). In discussing Buddhist atomism, Stcherbatsky writes:

...[T]he Buddhists denied the existence of substantial matter altogether. Movement consists for them of moments, it is a staccato movement, momentary flashes of a stream of energy... “Everything is evanescent”,⁴⁴ says the Buddhist, because there is no stuff... Both systems [Sāṃkhya, and later

⁴⁴ *Nyāya-sūtra*, IV. 1. 24 ff.

Indian Buddhism] share in common a tendency to push the analysis of Existence up to its minutest, last elements which are imagined as absolute qualities, or things possessing only one unique quality. They are called "qualities" (*guṇa-dharma*) in both systems in the sense of absolute qualities, a kind of atomic, or intra-atomic, energies of which the empirical things are composed. Both systems, therefore, agree in denying the objective reality of the categories of Substance and Quality,... and of the relation of Inference uniting them. There is in Sāṃkhya philosophy no separate existence of qualities. What we call quality is but a particular manifestation of a subtle entity. To every new unit of quality corresponds a subtle quantum of matter which is called *guṇa* "quality", but represents a subtle substantive entity. The same applies to early Buddhism where all qualities are substantive... or, more precisely, dynamic entities, although they are also called *dharmas* "qualities" (Stcherbatsky, 1962 (1930) : 1.19).

In other publications, and with novel arguments, I have argued that reality is composed of unconnected, unattached, indistinguishable, non-contacting, non-touching and non-interacting,⁴⁵

⁴⁵ It is interesting to note the way today's most progressive quantum physicists also come to the conclusion that the fundamental particles (some of which, such as electrons or quarks, may be true philosophic atoms) apparently do not contact, touch or interact in any sort of macroscopic manner, such as by bouncing off one another, or such as by surfaces interacting in some way. Instead, and as discussed in subsection 3.2 above, what "interaction" means in quantum physics is really a misleading word that physics use, because "interaction" or "touching" or "contacting" of particles at the quantum level are words that appear to all be *synonymous* with the word "momentariness". Consider this passage from the physicist Kane:

Nearly all particles are unstable and decay into others. The word decay has a technical meaning in physics—one particle disappears, typically turning into two or three others. A major difference between the way decay is used in physics and its use in everyday life or biology is that the particles that characterize the final state are not in any sense already in the decaying particle. The initial particle really disappears, and the final particles appear. The photons that make photons that make up the light we see provide an example: The photons emitted from a light bulb when it is turned on are not particle that were in the bulb just waiting to

unrelated,⁴⁶ point-sized, basic building blocks: true philosophic atoms: irreducible, uncuttable, partless.⁴⁷ These articles contribute to showing that (1) realist theories of reality and property possession⁴⁸ fail; (2) the structure of the world, as given to the non-nirvanic mind, is a conceptual creation (of the empirical non-nirvanic mind); and (3) reality is composed of the sorts of non-concrete true philosophic atoms just mentioned.⁴⁹

come out, and photons that enter our eyes... are absorbed by the molecules in our eyes and disappear. All particles can be created or absorbed in interactions with other particles. (2000 : 19)

⁴⁶ I argue this is Grupp forthcoming-c, and in other places. I do this by applying many similar arguments against temporal relations that I have presented in section 2 of this article, but in Grupp forthcoming-c I instead argue against the existence of relations between spatial locations and between spatial objects, such as the relation *at a distance from* that the empirical mind might imagine exists between, for example, the lion and the zebra.

⁴⁷ I argue this in Grupp, 2005, 2004a, 2004b, 2004c, forthcoming-a, forthcoming-b, and other upcoming articles.

⁴⁸ In the *Cambridge Dictionary of Philosophy* (Cambridge University Press, 1995) pp. 562-63, Butchvarov describes what is meant by "metaphysical realism":

Metaphysical realism, in the widest sense, [is] the view that (a) there are real objects (usually the view is concerned with spatiotemporal objects), (b) they exist independently of our experience or our knowledge of them, and (c) they have properties that enter into relations independently of the concepts which we understand them or of the language with which we describe them. *Anti-realism* is any view that rejects one or more of these theses, though if (a) is rejected the rejection of (b) and (c) follows trivially...

In discussion of universals [properties], metaphysical realism is the view that there are universals...

Perhaps the best summary of what the realist theories of reality are that I have seen is the summary given by Dreyfus, 1997 : 53-58.

⁴⁹ It is interesting to note that this model of atomism would solve some of the mysteries about the Big Bang theory. For example, it is often considered mysterious as to how an initial point (0-dimensional) of the universe (the singularity point of the universe before the expansion of the universe) could begin expanding, and could thereby become larger

The atoms, while considered by the conceptual mind to be at distances from one another, are nevertheless *indistinguishable*. The atoms are the same items, despite the fact that they are theorized by the empirical mind to be distinct: the mind theorizes that there is more than one object in reality (and thus more than one atom), but there is only *one*. One can refer to ultimate reality as “atoms,” as if atoms are distinct, since the empirical mind imagines that the atoms are distinguishable. But one can also refer to reality as “instances of the one atom that makes up everything;” this would be the appropriate way to describe ultimate reality. This is similar to the way physicists often consider the apparently irreducible particles they study—such as electrons or quarks. French and Krause write: “Electrons, like the other elementary particles, have no names, have no identity, and cannot be distinguished from one another” (French and Krause, 1996 : 27).

Since the atoms are indistinguishable, they are not countable, as when one counts items: 1, 2, 3, 4, ... (i.e., atom a_1 , atom a_2 , atom a_3 , atom a_4 , ...). This is because the atoms are indistinguishable. Rather, one would have to use the following symbolization, a_1, a_1, a_1, \dots , in order to label and describe ultimate reality. One could use a_1, a_2, a_3 , and so on, if one merely understood that even though atoms a_1, a_2, a_3 , and a_4 are not overlapping (they do not coincide) and are theorized to be at distances from one another, it is nevertheless the case that $a_1 = a_2 = a_3 = a_4$. One could use the a_1, a_2, a_3, a_4 symbolization, as long as one understood that talking in terms of a_1 and a_2 , for example, where the “1” and “2” symbolization make atoms a_1 and a_2 appear to be distinct since $1 \neq 2$, such distinctions are merely a construct or intuition of the conceptual non-nirvanic mind. It is common for philosophers and physicists to still discuss electrons as if they are distinguishable individuals (e.g., “electron a is at x and electron b is at y , where $x \neq y$, which might make it appear that $a \neq b$), even though they are indistinguishable, since this makes more sense to the ordinary, non-nirvanic, human understanding of reality. I will do the same when discussing philosophic atoms: one can assert

than a point (3-dimensional). But the model of atomism just described may get around this problem if at time $t = t_0$, continuum-many points overlapped (coincided) and therefore gathered in a region that is the size of one point, and the Big Bang explosion merely consisted of these points ceasing to overlap (coincide), and instead they spread out.

that atom a_1 is at x and atom a_2 is at y , where a_1 and a_2 do not coincide, even though $a_1 = a_2$.

Before describing abstract atomism, I will discuss a few issues for the sake of clarification. Atoms are real, and empirical items are conceptual. To understand how this can be, consider an example: a flock of birds. The flock, as a single whole item over-and-above the birds, is a product of the imagination, since the birds do not touch or connect, and the atoms that the birds are made of (i.e., that give rise to the appearance of there being a bird) do not touch or connect.⁵⁰ Without any touching or connecting, there is no means by which the birds (or the particles that compose the birds) can come together to form one mereological item (one whole item with distinct parts, where the whole is distinct from the parts). For those reasons, there is no flock; there are only the birds. This line of reasoning could be given for any item that is alleged to be a composite item. This indicates that there are only atoms, and to apprehend items that are non-imaginary is to have direct awareness of atoms. The nirvanic mind has direct awareness of the atoms that make up empirical reality, and which empirical reality can be reduced to.⁵¹

According to the typical accounts in physics and philosophy, through the centuries, the reasons for *why* there is motion are typically asserted to be due to one of the following: (a) the internal nature of matter; (b) fields, forces, and various interconnections (relations) between pieces of matter (or space); or (c) *direct* interactions (touching) between bodies. (There are also mixtures of (a) – (c) found in physics and philosophy.)

(c) can be described as follows by Pyle, in a passage about seventeenth century mechanistic philosophy:

Rest and uniform motion are alike *states* of bodies; changes of state require the action of forces; bodies resist, with a strength dependent on their quantity of matter, any attempt to compel them to change their state (Pyle, 1995 : 595-96).

⁵⁰ See Grupp, 2004c, forthcoming-a, forthcoming-b, and forthcoming-c, where I argue that any sort of connection between items is impossible.

⁵¹ I argue for this reductionism in Grupp 2004c, forthcoming-a, forthcoming-b, and forthcoming-c.

If reality is composed of point-sized unconnected unrelated atoms, as I argued elsewhere, that would indicate that contacting between any atoms, or any bodies made up of atoms, does not exist, and our perceiving real contact between items is an illusion. Therefore, even though the non-nirvanic empirical mind might believe there are direct interactions between empirical objects, it appears however that direct contact may not occur at all in reality, which would leave only (a) and (b) to consider.

Jammer discusses the widespread use of force and fields and relations that have popped up through the history of philosophy:

Force as a regulative agent in nature appears, perhaps for the first time in Greek thought, in Empedocles' doctrine of love and strife, and in Anaxagoras' theory of the mind (nous). Both doctrines aimed at an explanation of the causes of motion... These agents as causes of motion may rightfully be interpreted as "forces", although they were not held as immaterial, but as extended in space and corporeal (Jammer, 1999 : 25).

Plato interpreted Empedocles' two agents as attraction and repulsion, stating that their operation is conceived in an alternative sequence, whereas, according to Plato, the same forces operate simultaneously in Heraclitus' conception of nature (Jammer, 1999 : 27).

...Aristotle recognizes two kinds of forces, the Platonic conception of force inherent in matter, which he calls "nature" (physis), and force as an emanation from substance, the force of push and pull, causing the motion in a second object, and not in itself... For his mechanics, Aristotle confines himself solely to the concept of force as the agency involved in pulling or pushing, and ignores the Platonic concept of force as inherent in matter or what we may call today energy (Jammer, 1999 : 35-36).

In his search for possible other phenomena in which the attractive force of the sun may become perceptible or demonstrable, Kepler was thus left with only one possibility: Gilbert's magnetic forces. No wonder that Kepler, when writing his *Tertius in terueniens*, is convinced beyond any shade of doubt that his astronomical computations only confirmed his previous assumptions about the importance of

magnetic forces. In article No. 51 of this short treatise Kepler asserts emphatically: "The planets are magnets and are driven around by the sun by magnetic force."...

Kepler imagined these magnetic forces, emanating from the central body such as the sun, to be like giant arms propelling the planets on their appropriate orbits. He thought it necessary that for this purpose the central body itself should be in rotational motion (Jammer, 1999 : 89-90).

Jammer also discusses how through the history of physics, *many* physicists, such as Newton, have considered forces and fields to be relations (Jammer, 1999 : 200) :

With the rise of Newtonian dynamics and its interpretation along the lines of Boscovich, Kant, and Spencer, the concept of force rose almost to the status of an almighty potentate of totalitarian rule over the phenomena. And yet, since the very beginning of its early rise to power, revolutionary forces were at work (Keill, Berkely, Maupertuis, Hume, d'Alembert) which in due time led to its dethronement (Mach, Kirchhoff, Hertz). This movement in mathematical physics, from the time of Newton onward, was essentially an attempt to explain physical phenomena in terms of mass points and their spatial relations (Jammer, 1999 : 242).

This continues up until Einstein. Stenger writes:

So general relativity does away with the need to introduce the gravitational field. However, in its place another field is introduced: the metric field of space-time... [T]his metric field was not the same form at every point in space-time, but varied from point-to-point... Thus the metric of space-time is a field, denoting the geometry of each point in space and time (Stenger, 2000 : 76).

The word "metric" in Stenger's passage denotes a relation that connects points. I however found that all relations between distinct items are apparently impossible in another publication. Here is a passage from the conclusion of that article:

If my preceding arguments are sound, relations between regions larger than a basic building block of space are impossible, and there are no relations between non-identical basic building blocks of space. It appears that if this is the

case, then all basic building blocks in nature are apparently *unrelated* to one another, and all basic units of space are *unconnected*, and theorists who makes use of such relations between non-identical basic building blocks of space or non-collocated basic building blocks of matter, must explain how they are coherent (Grupp forthcoming-c, from the conclusion).

If my argumentation elsewhere is correct, and there are no relations between entities, it would mean there is no explanation for why there is motion in terms of forces, fields, and relations between entities, since if there are no connections of *any* sort (connections that are forces, fields, or relations) between items, there cannot be forces, fields, or relations that bind items together. Without *interconnecting* or *touching* between particles or philosophic atoms, there is no explanation of motion of objects in terms of (b) or (c).

In apparent agreement with my reasoning elsewhere, where I found that forces, fields, and relations do not exist, Gribbin discusses that since the birth of quantum physics, fields are now considered by quantum physicists to merely to be aggregations of particles—fields are made merely of particles:

In classical physics, a field is something, which stretches out from an object and conveys a force (there are really only two forces in classical physics, gravity and electromagnetism). The force can be described in terms of ripples in the field. Or waves. But in quantum mechanics we know that waves can be described in terms of particles. So the concept of a field in the classical sense is replaced by the concept of particles, which carry forces as they are exchanged between other quantum entities. The classic example is the photon, which mediates the electromagnetic force... (Gribbin, 1998 : 316-17)

Gribbin notes that a field is in fact an assemblage of particles. Therefore, motion appears to be to do with the particles themselves. Above we found that motion deriving from forces and connections between bodies, or by way of direct contact of bodies, does not occur. The only option left then is motion comes about by an internal principle of matter. I will next explain that what this (perhaps vaguely described) principle might involve, and that this principle can be understood with an understanding of the very nature of the abstract Buddhist atoms replacing from moment to moment. This replacing at

the ultimate level would give rise to the appearance of motion at the chemical or macroscopic level, and thus would be the cause of empirically imagined motion.

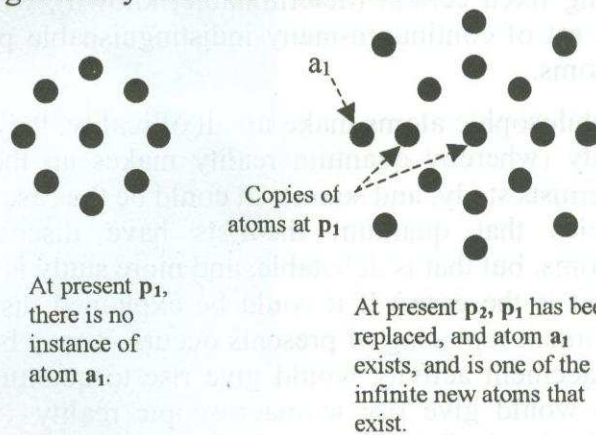
If ultimate reality creates the illusory empirical reality that the empirical observer believes exists due to their non-nirvanic awareness, then it would seem that the ultimate level would have to consist of items that are in motion (that replace) in order for the illusory empirical domain to involve any imaginary motion. If that were the case, motion would have to be the result of something akin to the remaining option mentioned above: (a) motion is a “force inherent in matter” (Jammer, 1999 : 35-36). To my knowledge, however, nobody has ever explained how this works, or what exactly this force is, without reverting to mysterious supernatural explanations, or to mysterious platonistic explanations. But I will argue that since Buddhist atomism is describable by the atomism I discussed above, then there is, in Buddhism atomism, is a simple explanation for precisely *why* replacing occurs, and therefore *why* the illusory empirical domain of reality that is made of real atoms thereby involves motion. It is an explanation that would describe motion in non-supernatural, uncomplicated terms, and that I have not seen before in any philosophic texts.

Some might wonder why there is replacement at all, or why the atomic building blocks of reality are in motion (i.e., why they replace), thus giving rise to replacing presents. Can't there merely be an unchanging reality where there is no motion and no change, and thus no replacement of presents? (If this were the case, and if ultimate reality were composed of indistinguishable and unconnected atomic building blocks that do not replace, then ultimate reality would apparently resemble *Brahman*: reality is one, is unstructured, partless, unmoving, and unchanging, (See Grupp 2004c and forthcoming-b.))

Abstract Buddhist atomism consists of a number of aspects:

- i. The number of atoms that make up reality is infinite (and *dense*, so there are \aleph_1 -many indistinguishable atoms: $\mathbf{a}_1, \mathbf{a}_2, \mathbf{a}_3, \mathbf{a}_4, \dots$; this will be argued in an upcoming article).
- ii. If there are infinite indistinguishable atoms composing reality, if an atom, call it \mathbf{a}_1 , comes into existence and thus is added to the atoms, or is destroyed and thus is taken out, the number of atoms making up reality *does not change*: there is still infinite atoms.

- iii. Mathematical description of the universe at any present is as follows: “an infinite set of atoms”. For that reason, it is unclear which is the correct mathematical description of reality: the description *with* atom a_1 in reality, or *not in* reality. Since the atoms are indistinguishable from one another, *both* descriptions of reality seem to be correct at any given present. Just by theorizing that reality is composed of \aleph_1 -many indistinguishable atoms, the aforementioned issue arises: the precise state of the atoms is not determinable (it is uncertain), since it is unclear whether or not instance a_1 exists.
- iv. To correctly describe reality, reality in at a given present must be described simultaneously as *having and not having* a_1 , but that appears to be impossible. It is however *not* impossible if there are be two states (two present moments) of reality that are *consecutive* states: state-1 of reality, which is without a_1 , is *replaced* by state-2 of reality, which has a_1 . In the first state, present a_1 does not exist, and then in the second state (which replaces the first) atom a_1 does exist. On this account, reality can never be considered as an enduring, unchanging set of atoms, since reality must be describable as changing by the process of atoms being added into reality. The following diagram may show how this works:



- v. Why do we have to describe reality as involving consecutive states? This can be answered by considering the following. Why do we have to describe reality with *and* without a_1 at any given present? Because both descriptions of reality are correct, but they cannot describe reality at *one* durationless present,

since that would be impossible: at present **p** reality has atom **a₁** and does not have atom **a₁**. So a present cannot stay itself, it must change—i.e., it must replace. Furthermore, *all* of reality must replace upon **a₁** coming into existence or being destroyed, since reality consists of instances of the *one* atom that exists, and if one instance of the atom (**a₁**) alters in any way, that would indicate that all of reality has changed. So that indicates that all of reality must alter. If all of reality must alter, then all of reality must replace.

If reality were only described as one state of infinite atoms, it could not be a complete description, since infinite atoms could be added in to mathematically describe the same reality. Thus reality must have *replacing* presents, where at each present reality consists of new instances of atoms. Only this way would reality have a complete mathematical description—with and without **a₁** (it is just the case that it happens over the coming into being of different present moments). On this model of atomism, due to the mathematics involved, atoms apparently must come into existence, and thus all of reality must change. That's the "engine" behind the **R**-theory of time: It cannot be the case that the present does not replace since that would amount to the state of, and the set of instances of, the atoms that make up reality being fixed certain (determinable, known), which is not possible for a set of continuum-many indistinguishable point-sized philosophic atoms.

Since philosophic atoms make up all of reality, they make up quantum reality (whereby quantum reality makes up the level of reality that chemists study, and so on). (It could be the case that some of the particles that quantum theorists have discovered are philosophic atoms, but that is debatable, and more study is needed to ascertain if that is the case.) If it could be explained just how the moment-to-moment replacing of presents occurs, it may be the case that such replacement activity would give rise to quantum reality, which in turn would give rise to macroscopic reality—where, of course, only the level of the atoms is real, however, and the other levels are conceptual).

According to the philosophy of abstract Buddhist atomism, the basic building blocks—which are atoms of energy, irreducible momentary pieces of existence—emerge in a lawless manner from the void. This also appears to possibly be in accord with the

description of the quantum foam, as it is occasionally referred to, that physicists have theorized makes up all of reality. In writing about the very tiniest levels of reality that physicists discuss, the physicist Brian Greene shows that the nature of reality described by physicists may appear similar to the reality of abstract Buddhist atomism:

As gravitational fields are reflected by curvature, these quantum fluctuations manifest themselves as increasingly violent distortions of the surrounding space... By probing to even smaller scales,... we see that the random quantum mechanical undulations in the gravitational field correspond to such severe warpings of space that it no longer resembles a gently geometrical objects... Rather, it takes on... frothing, turbulent, twisted form. John Wheeler coined the term quantum foam to describe the frenzy revealed by such an ultramicroscopic examination of space (and time)—it describes an unfamiliar arena of the universe in which the conventional notions of left and right, back and forth, up and down (and even before and after) lose their meaning... [The ultramicroscopic level is a] roiling frenzy of quantum foam... [A]s we recede to more ordinary distances..., the random, violent small-scale undulations cancel each other out... [T]he fabric of space-time appears to be smooth except when examined with ultramicroscopic precision (Greene, 1999 : 127-29).

If abstract Buddhist atomism does indeed correlate to the fundamental level of reality that physicists have theorized about, it would appear that the theory of abstract atomism would describe ultimately why reality is composed of replacing presents, and more interestingly, why exactly there is motion at all (why presents replace at all) at the ultimate level.

When considering the nature of the quantum vacuum (empty space) that physics describe, it also appears to be a seething, random and unpredictable, “boiling” froth⁵² of particles. Davies writes:

⁵² It is interesting to note the way that Buddha also used the themes of boiling, froth, and foaminess just as Greene and Davies do: “When a man considers this world as a bubble of froth, and as the illusion of an appearance, then the kind of death has no power over him.” (*Dhammapada* 170)

When physicists began to study the quantum theory of fields, they discovered that a vacuum was not at all what it had long appeared to be—just empty space devoid of substance and activity... The source of the trickery can be traced to Heisenberg's uncertainty principle as it relates to the behavior of energy... [T]he law of conservation of energy can be suspended by quantum effects for a very short interval of time. During this brief duration energy can be 'borrowed' for all manner of purposes, one of which is to create particles. Any particles produced in this way will be pretty short-lived, because the energy tied up in them has to be repaid after a minute fraction of a second. Nevertheless, particles are permitted to pop out of nowhere, enjoying a fleeting existence, before fading once again into oblivion. This evanescent activity cannot be prevented. Though space can be made as empty as it can possibly be, there will always be a host of these temporary 'ghost' particles... The temporary 'ghost' particles cannot be seen, even though they may leave physical traces of their brief existence. They are, in fact, a form of 'virtual' particle, similar to messenger particles, but with nothing on the 'ends of the line' to send or receive the message. They travel from emptiness to emptiness...

What might appear to be empty space is, therefore, a seething ferment of virtual particles. A vacuum is not inert and featureless, but alive with throbbing energy and vitality. A 'real' particle such as an electron must always be viewed against this background of frenetic activity. When an electron moves through space, it is actually swimming in a sea of ghost particles of all varieties—virtual particles, quarks, and messengers, entangled in a complex *mêlée*. The presence of the electron will distort this irreducible vacuum activity (Davies, 1984 : 104-105).

If I understand the positions of physicists on the Planck scale (as described by Greene) and the void (as described by Davies), these accounts of quantum reality may be in line with abstract Buddhist atomism since both involve momentary particles that emerge from nothing in an unpredictable manner. But this could only be verified if it could be known with a high level of precision what the nature of Buddhist ultimate reality is like (which involves the random production of instances of non-concrete abstract atoms coming into

existence from nothing), and what the nature of ultimate reality to the physicists is like (which involves quantum foaminess). But until those issues were shown with certainty, it must be considered highly speculative to consider abstract atomism and quantum foaminess to be similar theories.⁵³

5.2 Conclusion Part 2: The Whole World is Burning

If my preceding arguments are correct, I do not see a way to avoid the conclusion that the **R**-theory of time is the best theory of time we have been offered. There are no times that contact or connect to one another. Only a present moment exists, and the present moment replaces itself, where a new reality comes into being every instant. Since causation is behind the Buddhist philosophy of time, this article is an account of Buddhist causation, which involves real causation, and involves empirical causation. Empirical causation is mental and non-nirvanic, and transcendental causation is real. The **R**-theory of time indicates that the present moments of reality are *now* replacing one another, where if one had direct awareness of reality one would know reality as transcendental efficient moments (Stcherbatsky [1962 (1930) : 1.129] “[c]ause, efficiency or *moment* are but different names for the same thing”). From non-nirvanic awareness, one experiences imaginary causal connections between moments and thus fabricates the illusion of persistence and duration of objects. But when one experiences reality, one only experiences the efficient moments, rapidly replacing one another, like the flames of a fire. Buddha: “...the whole world is burning.” The non-nirvanic observer, unaware of the fiery, boiling nature of reality, is unaware

⁵³ One issue that I imagine some readers will have regarding the reasoning of this subsection is given in this endnote. Quantum foam is typically considered to be a theory involving *chronons*: time atoms that involve an irreducible duration. And I imagine some will complain that I cannot compare quantum foam with the **R**-theory of time since the **R**-theory involves a durationless present, rather than a present that is a chronon. But above, in endnote 32, I discussed simple reasoning as to why a chronon appears to be impossible: it appears that durations cannot be partless (cannot be composed of just one irreducible unit of time), and it appears that a present cannot have more than one instant making it up. For that reason, I discuss quantum foam in the context of this article under the assumption that eventually physicists will discover that the ultimate level involves time points rather than chronons as the items that replace.

that they will not exist beyond this present instant, and that any volition or hope is unneeded and illusory, and is based on the misery of unreality.⁵⁴

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