
The Looping Structure of Buddhist Thought (Or, How Chan Buddhism Resolves the Quantum Measurement Problem)

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Is there a world out there when nobody is looking? This is a question that medieval Buddhist scholiasts struggled with over many centuries, giving rise to a variety of competing positions. In this article, I identify a loop that runs through and structures seemingly antithetical positions—some realist, some antirealist—in these debates. My claim is that the loop is a feature of our lifeworld, and thus any serious reflection on the mind/world relationship is bound to get entangled in it. Even modern physics has come up against it, such that rival positions advanced by quantum theorists are structurally analogous to positions proffered in medieval Buddhist writings. I conclude by turning to the Chan Buddhist tradition, which is often mischaracterized as hostile to philosophical analysis. Chan is among the few Buddhist schools that recognize, foreground, and celebrate the manner in which mind and world enfold each other. As such,

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this paper foregrounds the decidedly philosophical insights of the Chan tradition.

When searching for harmony in life one must never forget that in the drama of existence we are ourselves both actors and spectators.

—Niels Bohr

WHILE on a stroll with physicist Abraham Pais, Albert Einstein suddenly turned to Pais and asked him whether he really believed that the moon exists only when one is looking at it (Pais 1979, 907). Einstein thought the idea untenable, and throughout his life he continued to insist that belief in an external objective reality is an indispensable foundation for the natural sciences. Einstein conceded, however, that this was a *belief* and not an empirically verifiable fact: “Since, however, sense perception only gives information of this external world or of ‘physical reality’ indirectly, we can only grasp the latter by speculative means” (Einstein 1954, 266).

People have pondered the existence and nature of the mind-independent world since the beginnings of philosophical reflection, but the modern form of the debate has been shaped largely by the critical investigations of Descartes, Hume, and Kant. By the end of the nineteenth century, the debate had become rather technical and arcane, accessible only to the cognoscenti who had worked their way through Kant’s transcendental arguments. But in the twentieth century, the rise and stunning success of quantum mechanics gave new life and urgency to the issue. Pace Einstein, who held that science *necessitates* realism, some scientists—notably those who came to be associated with the “Copenhagen interpretation”—began to question that conclusion. They felt that the indeterminacy observed at the quantum level posed a serious challenge to the conceptual coherence and analytic utility of scientific realism. It appeared that physical stuff, or at least the unimaginably tiny bits of stuff that show up at the quantum level, does not exist as such—that is, it does not possess determinate physical properties—until it is observed. As to what exactly it means to be “observed” is an area of ongoing controversy and debate; will a measuring apparatus operating on its own suffice, or does someone have to register the result? But one consequence of the quantum revolution is that some (but not all) reputable physicists would now claim, without irony, that quantum mechanics provides *scientific evidence* for some kind of antirealism.

Before proceeding I should clarify what I mean, or more to the point, what I do *not* mean by the term *antirealism*. Philosophers typically

construe *realism* as involving two logically distinct theses: (1) there is a way things are, irrespective of how we think things are; and (2) the truth of a proposition is determined by its correspondence to the way that things are. I am using *antirealism* to refer to positions that repudiate the latter claim, but not necessarily the former. That is to say, in my restricted usage, antirealism does not necessarily endorse or entail the *inexistence* of an extrinsic, mind-independent, or noumenal domain. Certain strands of Madhyamaka antirealism, for example, hold that it is incoherent to either affirm *or* deny the existence of an objective world. And some forms of scientific antirealism are decidedly agnostic on the existence of unobservable entities and processes, whereas others are self-avowedly “realist” but construe the real in non-objectifying terms. So my use of antirealism is restricted to a spectrum of positions—instrumentalist, positivist, historicist, constructivist, empiricist, nominalist, pragmatic, correlationist, and so on—that have in common, if nothing else, their rejection of the view that the truth or adequacy of a proposition or formula, whether philosophical or scientific, consists in its correspondence to, or accurate description of, an objective, frame-invariant reality, whatever that may be.¹

Determining the early Buddhist view of the ontological status of a mind-independent domain is no easy task. Indeed, it is far from clear that Buddhist exegetes would have been able to make sense of the question in the first place. One strand of early canonical thought, which foregrounds the doctrine of dependent origination (*pratītyasamutpāda*), holds that the world we perceive arises concurrently with mind. That is to say, the physical or sensible atomic bits (*rūpa-dharmas*) that constitute the material domain come into being if and when causal conditions permit, and the causal conditions include the co-presence of a constellation of mental dharmas that form a cognitive apparatus. In the classical dependent-origination formula, ignorance (*avidyā*), mental formations (*saṃskāra*), and cognition (*viññāna*) are *antecedent* to the arising of “name-and-form” (*nāma-rūpa*, i.e., the sensate world). But there is a curious variation on this in the *Mahānidāna-sutta*, in which name-and-form is said to be dependent on consciousness, but then the text immediately goes on to say that consciousness is dependent on name-and-form.² The Buddhist scholar Bhikkhu Bodhi calls this reciprocal relationship the “hidden vortex,” and the vortex clearly foreshadows the loop that I will discuss below.³ In any event, given the emphasis on dependent origination in

¹The philosophical literature on realism/antirealism is vast; for a pellucid discussion of antirealism in the context of Buddhist thought, see Siderits 2003, 113–137.

²*Dīgha-nikāya* 15, PTS:Dīi55, sections 21–22.

³See the discussion in Bodhi 1984, 18–22; note that Bodhi borrows the term “hidden vortex” from Bhikkhu Nāṇananda.

early Buddhism, it does not seem to make much sense to speak of objects existing in the absence of a sentient observer.

But things are not so straightforward. There are passing references in Pali materials, for example, to “material as such” (*dhammatā-rūpa*), a form of matter that appears to exist independently from sentient beings.⁴ This suggests that Pali exegetes felt compelled to make room for an external domain that perdures whether or not anyone is around to observe it. Moreover, even in the dependent-origination formula, it is unclear whether the enumerated list of causal relations is intended to be understood temporally or logically. (We will see that the Vaibhāṣikas held that an effect can coexist with its cause, making it possible for several sequential links in the chain to emerge simultaneously.) And besides, the doctrine of dependent origination is part of a soteriological project, the goal of which is liberation from the cycle of life and death. In all likelihood, the speculative question as to what might exist independently of mind would have been deemed irrelevant if not inimical to that goal. Be that as it may, insofar as the early tradition links “existence” (*saṃsāra*) with dependent origination, it would seem to lean toward the antirealist side of the meta-physical spectrum.

The French philosopher Quentin Meillassoux has coined the term *correlationism* to refer to “the idea according to which we only ever have access to the correlation between thinking and being, and never to either term considered apart from the other.”⁵ In Meillassoux’s analysis, almost all contemporary philosophy turns out to be irremediably correlationist, insofar as it holds the noumenal domain of the real—the “great outdoors” or “absolute outside”—to be off limits to serious philosophy. Continental philosophy, drawing from Husserlian phenomenology, abandons the real via the *epoché* and the methodological priority accorded to what is given in the immediacy of perception. And according to Meillassoux, even analytic philosophy, under the influence of Wittgenstein and the “linguistic turn,” tends to disavow the domain of the real as “something about which nothing can be said” (Wittgenstein 1967, §304). Setting aside

⁴See, for example, *Visuddhimagga* XX.73: “Natural materiality (*dhammatā-rūpa*) is a name for external materiality that is not bound up with faculties and arises along with the aeon of world expansion, for example, iron, copper, tin, lead, gold, silver, pearl, gem, beryl, conch shell, marble, coral, ruby, opal, soil, stone, rock, grass, tree, creeper, and so on” (Buddhaghosa 1991, 647). Note also that, according to some Sarvāstivāda exegetes, consciousness requires a physical foundation or “subtle body” to move from one existence to another at the time of rebirth, and this seems to have contributed to the doctrine of the “intermediate state” (*antarābhava*); see Kritzer 2000.

⁵Meillassoux 2008, 5. See also the somewhat similar notion of “mediational epistemology” by Charles Taylor (2013).

the issue of the cogency of Meillassoux's critique,⁶ he does seem to have captured something of the current intellectual Zeitgeist. And given the primacy placed by Buddhist exegetes on the co-arising of subject and object—mind and world—Buddhism might well be viewed as the epitome of correlationist thought. But again, things are not quite so simple.

It is true that arguments based on the experience of epistemic error or on perceptual relativity favored by subjective idealist philosophers such as Berkeley were familiar to Buddhists from early on. The oft-used example of a rope mistaken for a snake comes immediately to mind. Yet despite their emphasis on co-arising, early Buddhist thought is not, in any simple sense, phenomenology, much less analytic philosophy. The *Ābhidharmikas* are metaphysical dualists: the dharmas of mind are no more and no less real than are the material (*rūpa*) dharmas, and besides, the entire dharma theory presupposes a realist (frame- or observer-invariant) perspective. The *Ābhidharmikas* may be skeptical about the ultimate existence of compound things such as a “cart” or a “pot” or a “self,” but their skepticism does not extend to the transient and irreducible dharmas of which the compounds are comprised. The intent of the mereological dharma theory is not to do away with the external world, but rather to overcome attachment and to undermine belief in an overarching self or cogito (*ātman*), and this is accomplished by deconstructing experience into its constitutive elements.

One might then say that the early Buddhist theory of dependent arising was pulling in both antirealist (or correlationist) and realist directions at the same time. On the one hand, there is no world without an observer, so mind or consciousness is accorded a certain ontological priority. On the other hand, this observer emerges through the convergence of transient entities whose inherent properties (*svabhāva*) are observer independent, and thus the domain of dharmas (*dharmadhātu*) is ontologically prior to observation. The resulting tension proved philosophically fertile: the complex history of Buddhist thought can be seen as an ongoing attempt to grapple with this metaphysical riddle.

One issue that was rarely, if ever, addressed is the chicken or egg problem: which came first, mind or world? Since Buddhist cosmology regards time as beginningless, the issue of how the process got going in the first place is moot. Indeed, the notion of the beginninglessness (*anāditva*) of time might be seen as a necessary correlate of the interdependence of

⁶Indeed, his categorical dismissal of virtually all contemporary philosophy strikes many as facile and misleading. Note that, pace Meillassoux, many contemporary analytic philosophers consider themselves metaphysical realists.

subject and object. (If mind is ultimately *anterior* to world then it cannot be dependent on world, and vice versa.)

That still left plenty of other issues to preoccupy Buddhist scholasticists. What, ultimately, are dharmas? Do they have determinate natures (*svabhāva*, “own-being”), or are they merely nominal postulates? Are material dharmas knowable *directly*? If not—if consciousness has access only to second-order representations of physical objects—what warrants truth claims pertaining to the material domain? If there is no perduring world outside the transient flow of mind, how might we explain the experience of intersubjective cohesion and predictability? And if the co-arising of subject and object, mind and world, is ultimately governed by karma—the law of cause and effect—what exactly is the status of this “law”? Does it belong to the domain of the absolute (the world) or to the contingent and conventional (the mind)?

I will not pursue these complex issues in detail here; to do so would require rehearsing the entire history of Buddhist thought. My aim, rather, is to identify the underlying loop that runs through and structures these debates—a loop that entangles both realism and antirealism such that they cannot, in the end, be teased apart. This loop has its roots in the nature of what it is to be an embodied sentient being: we are, at one and same time, both objects and subjects to ourselves. That is to say, I am born into and occupy a minuscule corner of a universe that surrounds and exceeds me on all sides. I apprehend myself as a something existing *within* that universe. Yet, the universe in which I find myself has no palpable being apart from its appearance to *me*, and this “me”—myself as subject or cogito—is nowhere to be found within the empirical world itself. In a very real way, the realist claim that I emerge *within* the world, and the antirealist claim that the world emerges within me, while contradictory, must both be true.⁷

To be clear, I am not suggesting that the Buddhists discovered or even recognized this loop. Rather, my claim is that the loop is an ineluctable feature of our lifeworld, and thus any serious reflection on the relationship of mind and world is bound to get caught up in it sooner or later.

⁷The paradoxical nature of human embodiment has been explored at length by a number of philosophers, including Krishna Chandra Bhattacharyya, Maurice Merleau-Ponty, and Thomas Nagel. Nagel's work—especially his argument that first- and third-person perspectives are simultaneously antithetical to, yet interdependent on, one another, is particularly germane to the argument presented here. As I have discussed the enfolded nature of mind and world at length elsewhere, I will forgo rehearsing my argument here, except to note my conclusion, namely, that the paradox engendered by the dualistic nature of our embodiment—that we are both subjects and objects to ourselves—is existential rather than merely analytic (Sharf 2021, chapter 9). For a phenomenological analysis of the paradoxical nature of subjectivity, see esp. Carr 1999, and Durt 2020.

Even modern physics—that branch of science devoted to the exploration of the elemental constituents of the physical universe—has come up against it. Note how contemporary quantum theorists, working from the same accepted body of experimental data, offer competing theories that run off in divergent realist and antirealist directions. We will see that the rival positions advanced by quantum theorists—Copenhagen interpretation, Bohmian mechanics, many worlds, decoherence, QBism (quantum Bayesianism), and so on—are structurally isomorphic to positions proffered in medieval Buddhist writings.

Buddhist correlationist metaphysics may have brought the loop to the surface, but, with a few notable exceptions, Buddhist exegetes were loath to acknowledge it. Philosophers in India were no more comfortable with contradiction than were their philosophical counterparts in the West, and thus Buddhist exegetes did what they could to tame or flatten out the loop. Rather than concede that realism and antirealism may *both* be true, they try—much like the quantum theorists—to resolve the paradox in favor of one or the other perspective. That is to say, they try to elucidate and defend an internally consistent (non-contradictory) realist *or* antirealist position. In doing so, they aver to a few key exegetical strategies. One is what I will call the “fission gambit.” This popular divide-and-conquer strategy involves asserting that what is held to be single is actually multiple. Another—the “fusion gambit”—is just the opposite: it involves declaring that what appears to be many is, on analysis, one and the same. Yet another strategy is “dialectical sublation,” which is an attempt to resolve a dialectical tension by identifying and transcending the antinomies. As we will see, the use of such stratagems is often a clue that an author is caught in the loop and struggling to find a way out.

I end by turning to the Chinese Chan tradition, which is among the few Buddhist schools that recognize, foreground, and even celebrate, in both its philosophical writings and its religious practices, the paradoxical manner in which mind and world enfold each other. Rather than seeking to evade the loop, through fission, fusion, or sublation, Chan lays bare its structure and dangles it in front of one’s nose. As such, one of the aims of my analysis is to foreground the decidedly *philosophical* insights of the Chan tradition—a tradition that is often mischaracterized as hostile to philosophy.

ĀBHIDHARMIKA METAPHYSICS

Let us begin with the status of the dharmas or “atoms” that comprise the building blocks of early Buddhist ontology. Are they empirical objects

known directly by the senses, or are they known only inductively? Or are they, in the end, merely nominal postulates?⁸

Given the witness of early Ābhidharmika sources, it would appear that Buddhist scholiasts, drawing on scriptural accounts, originally held that all consciousness is conceptually mediated. More specifically, cognition (*viññāna*) of an object is invariably accompanied by various “associated mental factors” (*caitasika-dharma*) that contribute to the apprehension and conceptual identification of, and affective response to, a sense datum. To borrow Franz Brentano’s terminology, consciousness is “intentional” in that there is no consciousness without content. For the Buddhists, content requires the capacity to discriminate (*vikalpa*), and in the early tradition this discriminative capacity is linked to conceptual and linguistic capacities. There is, in short, no room for unmediated knowledge of the physical world. This is, arguably, a logical entailment of early Buddhist correlationism, which holds that thinking and being are inextricable; note that, in our early sources, *nirvāṇa* is not merely the cessation of discrimination and cognitive content, but the cessation of consciousness itself (Sharf 2014a).

But this creates a problem. The Ābhidharmika model of perception posits a temporal gap, however brief, between the apprehension of a material object (*viṣaya*, “object field”) by sense cognition and the subsequent arising of “mind cognition” (*manovijñāna*). It is mind cognition that discerns or discriminates the object via the application of names and categories.⁹ But if this is true, then when the senses first make contact with a physical form there must be an initial *nonconceptual* (*avikalpaka*) moment in which a sense faculty or sense cognition grasps its object directly. So despite the widely accepted view that sense cognition does not have access to conceptuality and hence cannot discriminate, Ābhidharmikas are forced to concede that sense cognition does apprehend, in some manner, a physical form. And this raised many of the same conundrums that attend recent debates over *qualia*, including questions surrounding the sensible “content,” if any, of nonconceptual perceptual states and whether such states can properly be described as being “conscious” as opposed to constituting part of the subdoxastic cognitive machinery running in the background.

⁸The following brief summary of early Vaibhāṣika and Sautrāntika theories of perception draws from the detailed analysis in Sharf 2018.

⁹It is not easy to ascertain whether this claim is predicated on scriptural authority, logical necessity, or phenomenological reflection. My suspicion is that, to the extent that they can be disentangled, all three play a role.

The Vaibhāṣika approach to this puzzle is to divide and conquer. They distinguish between three different *kinds* of discrimination and claim that only the second and third kinds (*abhinirūpaṇā-vikalpa* and *anusmaraṇa-vikalpa*) involve conceptuality. In contrast, the first kind of discrimination (*svabhāva-vikalpa*) consists in the raw or unmediated apprehension of the object field in which the sense faculty (or, according to some exegetes, sense cognition) directly grasps the “inherent characteristic” (*svabhāva*) of said object.¹⁰ Unsurprisingly, however, the Vaibhāṣikas have a tough time making conceptual sense of the content of this non-conceptual perceptual event, but that is the price they must pay for grounding perception in the unmediated sensory apprehension of the real. The Vaibhāṣika *trivikalpa* theory—the claim that there are three kinds of discrimination, one of which is direct and unimpeachable—paves the way for a correspondence model of truth that mitigates the threat of idealism.

The Sautrāntika analysis of perception parts ways with the Vaibhāṣika model on several significant points. First, they reject the Vaibhāṣika argument that sense object, sense faculty, and sense cognition arise simultaneously. In the Sautrāntika model, there is an initial moment in which a sense faculty arises in tandem with an object, and this triggers the subsequent arising of sense cognition proper. But given the transient nature of dharmas, the original sense object is gone by the time sense cognition kicks in. As such, sense cognition is confronted with a virtual “after-image” or “representation” (*ākāra*) of the object rather than the object as such. Thus, in contrast to the Vaibhāṣika analysis, the Sautrāntikas hold that there is never direct contact between consciousness, *including sense consciousness*, and a material object. The Sautrāntikas are sometimes regarded as nominalists, and they seem to flirt at times with idealism; later commentators will argue that Sautrāntika *sākāravāda* theory (the theory that we have conscious access only to mental representations) paved the way for full-blown mind-only (*cittamātra*) thought. But Sautrāntika exegetes are in fact at pains to mitigate idealism, and to this end they argue that the *ākāra* or mental representation is simply mind itself assuming the true form of the object. That is to say, although consciousness trades only in representations, the representations have a direct, deterministic causal link to the perceptual field grasped by the sense faculties, and this makes knowledge of the objective world possible.¹¹

¹⁰See *Abhidharmakośa* T.1558: 29.8a27-b5; **Nyāyānusāra* T.1562: 29.350b9-10; and the discussion in Sharf 2018, 841 ff.

¹¹On Sautrāntika and their use of *ākāra*, see esp. Dhammajoti 2007b; 2009, 269–75; Kellner 2014; Kellner and McClintock 2014; Sharf 2018, 832–34.

In sum, both Vaibhāṣika and Sautrāntika conform to scriptural orthodoxy insofar as they maintain that the material world arises in conjunction with a sentient observer. But, in their view, this is not tantamount to antirealism, much less idealism, as the objects of raw sense perception, whether cognized directly as Vaibhāṣikas believe or indirectly as Sautrāntikas would have it, are real in and of themselves—they have *svabhāva*. Presumably, the Ābhidharmikas grasped the threat that antirealism poses to the Abhidharma project, and thus they felt compelled to affirm the self-existence of physical (*rūpa*) dharmas. However, both Vaibhāṣikas and Sautrāntikas struggle to make sense of the pre-conceptual perceptual moments in which the physical domain is disclosed. They repeatedly characterize it as what it is to “know blue” directly as opposed to knowing conceptually “this is blue,” but this seems question-begging.

One question it begs, for example, is whether the nonconceptual, raw apprehension of blue can be deemed *conscious*, or, alternatively, whether it is merely part of the subliminal cognitive processes running under the hood. Curiously, to my knowledge the question is not explicitly addressed until Saṃghabhadra’s fifth-century compilation, the **Nyāyānusāra*. Saṃghabhadra tackles this problem by employing the fission gambit: he argues that we need to distinguish three different *kinds* of perception, namely the immediate “perception by the sense faculty” (*yigen xianliang* 依根現量, **indriyāsrita-pratyakṣa*), the “perception of [inner] feeling” (*lingna xianliang* 領納現量, **anubhāva-pratyakṣa*), and “perceptual awareness” (*jueliao xianliang* 覺了現量, *juehui xianliang* 覺慧現量, **buddhi-pratyakṣa*). This allows him to claim that, while immediate sense perception may not be conscious in and of itself, it arises *concurrently* with “perception of feelings,” and this involves some kind of inner awareness. The result is that, in Saṃghabhadra’s analysis, the initial moment of non-conceptual sense perception *both is and is not conscious*—a delightful example of how “divide and conquer” is deployed to avoid contradiction.¹²

CAUSALITY

That both Vaibhāṣika and Sautrāntika exegetes sought to preserve realism suggests that they were aware of the stakes. If the phenomenal domain that is cognitively available to us is not ultimately grounded in mind-independent reality—a *dharmadhātu*, however understood—how do we account for the intersubjective stability and cohesion of the lifeworld?

¹²On the three kinds of perception, see **Nyāyānusāra* T.1562: 29.374c13 ff. and 736a9 ff., as well as the discussions in Cox 1988, 75 n.27; Dhammajoti 2007a, 137–39; Dhammajoti 2009, 276–77; Sharf 2018, 850–52; and Yao 2005, 86–89.

There must be *some* fundamental “laws of nature” working behind the scenes that govern the dynamics of the virtual, correlationist world we inhabit. For Buddhists, these laws are the laws of cause and effect or karma that regulate interactions among the evanescent dharmas. But in their analyses of the nature of causation, Buddhists, like Hume, discovered that causation is more elusive than it initially appears. In short, they became entangled in the loop.

To give a single example, one issue that Ābhidharmikas wrestle with is the temporal contiguity between cause and effect. Some insist that you cannot properly claim that one thing *causes* another unless there is a temporal gap between the two; if they arise together, you cannot logically disambiguate which is the cause and which the effect. But others disagree, insisting that if there were a gap, then a necessary relationship could not be definitively established—you would have conjunction but not causation. In this latter view, causation proper requires the actual concurrence of cause and effect.

The Vaibhāṣikas opted for concurrence. Their claim that cause and effect arise simultaneously is a natural corollary of their theory of the existence of past and future dharmas (*sarvāsti*, “all exists”). Indeed, for the Vaibhāṣika, the existence of past and future elements is necessitated by the doctrine of momentariness; a transient event that has passed can function as a present cause only to the extent that the past event still exists. Sautrāntikas, however, find this unacceptable. They argue that it makes no sense to claim a cause-effect relationship between two concurrent events since the very notion of causality entails a temporal disjunction. But Sautrāntika must then explain how a no-longer-extant event can have causal efficacy in the present, and here they aver to their theory of “seeds” (*bīja*): past events leave behind seeds that endure and later mature to serve as the efficient causes for present events.¹³

Once again, there is a highly technical and sophisticated literature on this topic that I cannot explore here.¹⁴ My point is simply to note that early Ābhidharmikas recognize, at least tacitly, the Humean problem—that phenomenologically we are confronted with contiguity but not necessity. Yet they are at pains to avoid the Humean conclusion—that the so-called “law” of causality is mere conceptual imputation. They propose two competing theories, each of which has an air of desperation about it: one claims that past events, albeit past, still exist, and the other that past

¹³On the Sautrāntika theory of seeds, see esp. Park 2007.

¹⁴On Vaibhāṣika and Sautrāntika theories of causation, see esp. Dhammajoti 2007a, 94–101 and 2009, 154–64.

events are no more, but their *seeds* continue. Here too we see the lengths to which Ābhidharmikas will go to preserve realism.

The Ābhidharmikas have good reasons to be worried. Their claim that the self (*ātman*) is an illusion that arises through karmically determined interactions among transient mental and physical dharmas is tenable only to the extent that karma and dharmas are *real*. In other words, if karma and dharmas are to be used to explain how the world appears, they must have some reality apart from those appearances. Yet asserting such a mind-independent existence seems at odds with the doctrine of dependent origination.

MAHĀYĀNA CRITIQUE

This is precisely where Nāgārjuna will intervene. His project is to debunk Sarvāstivāda realism, which he regards as incoherent and inconsistent with the core Buddhist insight of dependent origination. His task will be relatively easy given that the Vaibhāṣikas and Sautrāntikas have already done much of the heavy lifting. That is to say, Nāgārjuna can avail himself of Vaibhāṣika critiques of Sautrāntika and Sautrāntika critiques of Vaibhāṣika to undermine both their positions at once. This strategy is evident, for example, in chapter 1 of the *Mūlamadhyamakārikā* (“Fundamental Verses on the Middle Way,” hereafter *MMK*), which takes to task the notion of cause and effect. Here Nāgārjuna argues, pitting Vaibhāṣika and Sautrāntika positions against one another, that causation cannot hold if there is a disjunct between cause and effect (e.g., if seed and sprout are temporally discrete), but it also cannot hold if they are concomitant (e.g., if the sprout is already somehow coexistent within the seed). The conclusion of Nāgārjuna’s complex argument is that an internally consistent account of the true nature of causation is unavailable precisely because causation has no true nature—it is not something that exists in and of itself but is rather a conceptual imputation. He then goes on to apply the same *reductio ad absurdum* method to virtually every other important concept in the Ābhidharmika arsenal, including motion, the senses, the aggregates, the defilements, and so on. All such concepts are empty of “own-being”—they do not ostend actual things in the mind-independent universe but are merely conventional (relational) ways of speaking. This, for Nāgārjuna, is the central insight of the Buddha’s correlationist teachings. So far so good.

But then it would seem that Nāgārjuna’s *reductio ad absurdum* arguments should apply equally to the Buddhist teachings as well—to the four noble truths, the stages of awakening, the three refuges, and

so on. If they too are mere conceptual imputation, it would appear that Nāgārjuna's critique threatens to undermine the veracity of the *buddha-dharma* itself. If everything is empty, as Nāgārjuna claims, what grounds are there to privilege the Buddha's teachings over those of his rivals? This is the worry that motivates chapter 24 of the *MMK*, in response to which Nāgārjuna famously distinguishes between two truths, namely, absolute or ultimate truth (*paramārthasatya*) and conventional or relative truth (*samvrttisatya*). Buddhist teachings are conventionally true insofar as they point toward the absolute. This presumably will allow Nāgārjuna to distinguish the conventional *truth* of the Buddha's teachings from the conventional *falsehood* of his rivals.¹⁵ Insofar as the conventional truth of the Buddha's teachings is warranted, in the end, by its privileged relationship to the absolute, much will depend on how one understands this absolute. And here we see Nāgārjuna and his commentators pressing up against the same loop: in terms of logical structure, absolute is to conventional as realism is to antirealism.

To a skeptic, the two-truths doctrine might appear out of step with the rest of Nāgārjuna's text; the skeptic might well view it as an apologetic attempt to shield the Buddhist teachings from the full force of his own deconstructive logic. If Nāgārjuna's aim is to purge Buddhism of misplaced dogmatic realism (the Sarvāstivāda dharma theory) and to reinstate the early correlationist insight of dependent origination, why not simply say: "Yes, my critique applies to the teachings of the Buddha as well—they too are empty," and stop there? Why go farther and posit a second truth—an "absolute truth" of emptiness? Nāgārjuna will, of course, acknowledge that emptiness too is empty, but in appealing to the doctrine of two truths he seems to be deploying the fission gambit. (In bifurcating "truth," Nāgārjuna allows the Buddha's teachings of the four noble truths, the stages of awakening, and the like to be true [conventionally] yet not true [ultimately] at one and the same time; he gets to keep his Buddhist cake and eat it too.) But whatever Nāgārjuna's intent may have been, the doctrine of the two truths, perhaps more so than any other Buddhist tenet, captures the paradoxical structure of the loop. And I suspect that this is why it has attracted so much interest and debate.¹⁶

¹⁵It should be noted, however, that Nāgārjuna himself does not make this explicit; it would be left to his commentators to distinguish conventional *truth* from conventional *falsehood*.

¹⁶Despite the importance of the two-truths doctrine in later Madhyamaka exegesis, it should be noted that the doctrine makes only a brief appearance in the *MMK*, and an even briefer appearance in the *Vigrahavyāvartanī*, a text intended to clarify Nāgārjuna's own "non-position." (See verse 28 in the latter text, which references *MMK* chapter 24.) Note also that the two-truths doctrine engenders a paradox that threatens to undermine its rhetorical and hermeneutic utility. (The paradox quickly comes to the surface when one asks: Is the doctrine of two truths true conventionally or true ultimately?) For a more detailed discussion of the paradoxical nature of the two truths, see Sharf 2021, 85–91.

The domain of conventional truth seems clear enough. At its most basic, it refers to the phenomenal world of our mundane existence—the socially and conceptually constructed world made up of carts and pots and cows and persons and sundry other things. It comprises the shared linguistic conventions, beliefs, and practices that sustain what sociologists call the *nomos*. It is essentially pragmatic, which is to say that conventional truth claims are warranted insofar as they work for us and elicit communal assent. The Buddha's teaching is conventionally *true* in that it is able to mitigate suffering, whereas the teachings of his rivals perpetuate conceptual falsehoods that lead only to more pain. The rub is that the conventional truth of Buddhism liberates one from suffering precisely by pointing in the direction of the absolute. So everything hinges on how one understands this absolute.

It is not easy to characterize this absolute. By definition, it is not relative or conditional, and thus as an *in-itself* cannot be understood in relation to anything else. Mahāyāna exegetes struggled with this issue over many centuries, giving rise to multiple competing and increasingly sophisticated accounts. For our present purposes, I will discuss their arguments under three broad groupings: deflationary (or analytic) approaches, transcendental (or phenomenological) approaches, and synthetic approaches that try to mediate between deflationary and transcendental strategies.

Under the “deflationary” heading, I would include positions classified as **Prasaṅgika* (“reductio”) or Rangtong (“self-emptiness”) by Tibetan doxographers as well as certain strands of Chinese Chan such as the Baotang 保唐 school.¹⁷ According to this view, Nāgārjuna's arguments demonstrate the necessarily contingent nature of all language. All denotation and predication is based on making distinctions—on slicing and dicing—and thus truth claims are necessarily observer and context dependent. There is no escape from contingency; the “view from nowhere” is just another view from somewhere, since the very notion of *view* presumes a subject position. Even to claim that “all things are empty” cannot be true in any ultimate sense, since it pertains only to what can be said about the world and not to the world as such. Given this logic, the distinction between the conventional and the absolute must itself be conventional, since the absolute does not brook any distinctions. We then arrive at the peculiar conclusion that absolute truth is precisely the truth that all

¹⁷**Prasaṅgika*, like **Svātantrika* and *Yogācāra* which appear below, is a contentious category that is often applied anachronistically, and there are critical disagreements on key issues among commentators within a single “school.” Nor would Buddhist scholiasts of any stripe necessarily concur with the analyses I am offering here. Again, my interest lies not in the details of Buddhist doxographic systems, but rather in the loop in which Buddhist exegetes of all stripes find themselves caught.

truth is conventional. Meillassoux's "great outdoors" is a chimera—a be-guiling piece of philosophical nonsense.

But we are not done. If absolute truth is merely the claim that all truths are conventional, then conventional truth is the only truth left standing. The very notion of an extrinsic or mind-independent world that might serve to ground truth claims, whether conventional *or* ultimate, is itself the product of our inescapably conventional and dualistic ways of thinking. So if conventional truth is the highest truth there is, it must be absolute. It turns out we have been in the great outdoors all along! Here the loop rises to the surface: the absolute is precisely the conventional, and the conventional is the absolute. They enfold one another, as do realism and antirealism. (Note the scriptural warrants for this line of interpretation in the Prajñāpāramitā literature, which enfold *saṃsāra* into *nirvāṇa* and vice versa.)

So much for the deflationary view. Transcendental approaches to the two truths are more typical of Yogācāra, Tathāgatagarbha, Shentong ("other emptiness"), and some *Svātantrika ("autonomous syllogism") and Chan commentators. This line of interpretation rejects the deflationary, analytic position as incoherent and self-contradictory. But more critically, the transcendentalists claim that the deflationary view undermines the Buddhist path, as it collapses the distinction between *saṃsāra* and *nirvāṇa*, ignorance and awakening, path and goal. Transcendentalists hold that there is no Buddhism without the goal, and if the final goal is merely the realization that the conventional is all there is—that there is no final escape from contingency—then what is the point? Like Meillassoux, the transcendentalists want to escape the correlationist circle, and they view the deflationary approach—the claim that the circle, seen for what it is, *just is* the real—as a cop-out.

There are profound differences among competing transcendentalist approaches, but they are united in their insistence that the absolute stands apart from contingency. It is the domain of the real attained or realized or known by buddhas and advanced bodhisattvas. It is described as *nirvikalpa*—as free of ignorance, duality, discrimination, and conceptual imputation. But what can it possibly mean to "attain" or "realize" or "know" such a state?

One possible approach to the absolute is to consider it tantamount to the ascetic *nirvāṇa* of the early *śramaṇa* tradition, in which *nirvāṇa* is escape from *saṃsāra simpliciter*. That is, once *nirvikalpa* is attained, and the dualisms of figure and ground, subject and object, mind and world are cast aside, the aggregates (*skandha*) cease, and with them cognition and phenomenality. (One might characterize this as a "higher-order thought" approach to *nirvikalpa*: in the absence of conceptual discrimination,

there is no consciousness and thus no world.) This notion of the absolute is rather difficult to distinguish from death, as death is understood by secular moderns who do not believe in an afterlife. It is easy to see why this “Hīnayāna” understanding of the absolute was associated, rightly or wrongly, with nihilism, and unsurprisingly this reading never gained much traction among Mahāyāna exegetes.¹⁸ I suspect that the threat of nihilism may have motivated, at least in part, some of the transcendentalist approaches.

The problem for the transcendentalists, then, is how to *positively* characterize the collapse of subject-object duality such that something remains in emptiness. Their solution is to claim that the state of *nirvikalpa* simply discloses what has always been present—the non-dual in-itself from which the phenomenal world with its subject-object structure emerges. Indeed, according to this view, the very claim that the phenomenal domain is *contingent* is only intelligible against the backdrop of the real. Various terms are used to denote this non-contingent absolute, including *śūnyatā*, *dharmatā*, *dharmadhātu*, *tathatā*, *tathāgatagarbha*, *pariṇiṣpanna-svabhāva*,¹⁹ buddha-nature, and so on. The challenge, then, is how to make sense of this absolute given that (1) it must be bereft of sensible qualities and cognitive content, and at the same time, (2) it must be distinguishable from the heterodox, non-Buddhist, non-correlationist notion of *brahman*.

In their positive accounts of *nirvikalpa*—the collapse of mind-world duality—Mahāyāna transcendentalists generally fall into one of two camps: they can claim either that mind alone remains or that the world alone remains. In the first approach, the falling away of subject-object duality discloses the abiding “luminous mind” (*prabhāsvara-citta*), or “pure consciousness” (**amalavijnāna*, *jingshi* 淨識); the claim is that luminous consciousness has been immanent all along but our knowledge of it is obscured by defilements and deluded thought. Writers frequently aver to analogy to explain how this can be so: luminous mind is like the still surface of a clear mirror that registers, but is ultimately untouched by, the transitory images that appear within. Or it is like the ocean: the wind blows, stirring up waves that obscure the natural clarity of the water; as the wind and waves settle, the abiding clarity is revealed. This “luminous-mind” strategy is popular in certain Yogācāra, Tathāgatagarbha, Northern

¹⁸For attempts, in both the primary and secondary literature, to construe Nāgārjuna’s position as a form of nihilism, see Westerhoff 2016.

¹⁹*Pariṇiṣpanna-svabhāva* is deemed the ultimate in Yogācāra *trisvabhāva* theory provided one follows the “progressive-model” interpretation. According to the alternative “pivot model,” the ultimate ground or ontological foundation is *paratantra-svabhāva*. On the two interpretations see Sponberg 1982.

Chan, Dzogchen, and Tantric traditions. Like the Ābhidharmikas, they feel compelled to ground their correlationism in a non-contingent, “empirical” reality, but where the Ābhidharmikas make unconstructed cognition the bare *quale* present in the first instant of sense cognition, before conceptuality kicks in, these transcendentalists render it the enduring, untainted, ground of all phenomenal appearance. The problem, of course, is that this luminous mind begins to sound suspiciously like an eternal soul or *ātman*, and this does not go unnoticed by critics.

The alternative transcendentalist strategy steers clear of the *ātman* problem by claiming that *nirvikalpa* brings an end not to the world but to mind itself. This approach has the advantage of de-reifying mind and consciousness and thereby hewing to the correlationist insight that consciousness, being intentional (having a subject-object structure), necessarily entails cognitive content. As such, the attainment of *nirvikalpa*—the end of the illusion of an antonymous self or cogito that stands apart from the natural world—is the end of mind and consciousness. However, while the *for-itself* ceases, the holistic *in-itself* or *dharmadhātu* is left untouched. To attain the absolute is thus to lose oneself or disappear into the insentient natural world—Meillassoux’s ancestral world that exists prior to givenness. This is not the nihilistic, “Hinayāna” insentience of utter nothingness, but the quiescent insentience of grass and trees, walls and fences, roof-tiles and stones. (A roof-tile, being devoid of any sense of self, clings to nothing and is utterly free of suffering.) In short, *nirvikalpa* is “mindlessness” (*wuxin* 無心). This position is characteristic of Oxhead Chan texts that explicitly defend the buddhahood of the insentient, but I would also include in this category the “robo-buddha” interpretation of Chandrakīrti advanced by Mark Siderits.²⁰ (It is also reminiscent, in some respects, of the eliminative materialism of Willard Quine or Daniel Dennett.)

Some might argue that the distinction between “luminous mind” and “mindlessness” is, in the end, merely rhetorical. That is to say, they are both merely “fingers pointing to the moon”—the moon being the transcendent, non-dual, and ineffable ground of being. Hence, differences between these two transcendentalist positions have to do with rhetorical style or pedagogical considerations (*upāya*) rather than with their ultimate purport. But Buddhist exegetes evidently felt otherwise, and they invested considerable energy defending their respective positions. They were driven by the need to distinguish their positions from the mindlessness of *nirodhasamāpatti* (a meditative state akin to a deep coma) and

²⁰On the Chinese debates over the buddha-nature of insentient things, see Sharf 2014a; on Oxhead Chan, see McRae 1983; on the “robo-buddha,” see Siderits 2011.

the “beings without conception” (*asaṃjñika-sattvāḥ*, celestial beings who have material bodies but no minds) and at the same time to avoid the monistic *ātman/brahman* theories of the *tīrthikas* (non-Buddhist heretics), and this did not leave them much wiggle room. The eighth-century debates between the so-called Northern and Southern schools of Chan, as well as the Samyé debates between the Indian master Kamalaśīla and the Chinese master Moheyan 摩訶衍, were attempts to identify and delineate what wiggle room there may be (Sharf 2014a; Sharf 2014b).

There is one more approach—we might loosely call it synthetic—that tries to mitigate the tension between the antinomies of conventional and ultimate. This approach draws from, and attempts to synthesize, the various deflationary and transcendental perspectives by employing a divide-and-conquer strategy. I have in mind the *Svātantrika (“autonomous syllogism”) distinction between two kinds of conventional truth, the Yogācāra doctrine of the three natures (*trisvabhāva*), the Tiantai 天台 claim that Nāgārjuna posited not two truths but three, and so on. In each case, exegetes posit a new category that is intended to mediate between, straddle across, or sublimate the antinomies of conventional and real, mind and world. Thus *Svātantrikas come up with “true conventional reality” (*tathya-saṃvṛti*), Yogācārins speak of the “dependent nature” (*paratantra-svabhāva*), and Tiantai exegetes proffer a third “middle truth” (*zhongdi* 中諦). The point of these synthetic theories is, at least in part, to mitigate the strong correlationism of the deflationary approach, which collapses the in-itself into the for-itself, and at the same time to avoid the reification of the absolute that is endemic to transcendentalist approaches. The synthetic positions tacitly recognize the incoherence of stand-alone realist and antirealist positions and aim for some kind of synthetic solution. They do so through a combination of fission and fusion—through the proliferation of new categories and schemas that capture and ultimately resolve or sublimate the contradictions. Yet insofar as they seek to rein in the loop—to find a stable handhold in the enfolding of mind and world—they are doomed to fail. In time, another brave commentator will come forward, convinced that, with just a bit more tweaking—a little fission here and a little fusion there—they can make a go of it; but they will not succeed. The problem is that there is no place to stand, either outside or inside the loop, to take its measure.

THE QUANTUM MEASUREMENT PROBLEM

Meillassoux claims that there is a disconnect between the “idealism” of correlationist philosophy and the realism of scientific thought. For example, according to Meillassoux, scientific thought accepts the existence

of the “ancestral world”—the world that existed long before the emergence of *Homo sapiens*. Correlationism is enfeebled insofar as it is unable to accommodate or even acknowledge the mind-independent existence of this ancestral world. For the correlationist there is simply no reality outside of givenness. Meillassoux’s argument, in short, is that modern science *presumes* a “natural” world that is beyond the reach of contemporary correlationist philosophy; hence, contemporary philosophy must seek to escape from its self-defeating anthropocentrism. (This is the task that has been taken up by speculative realism, object-oriented ontology, actor-network theory, and so on.) Yet this is a peculiar claim, as it ignores the fact that the branch of science most concerned with the nature of the mind-independent world is physics, and developments in twentieth-century physics have encouraged at least some serious physicists to question the observer-independent or frame-invariant status of fundamental categories such as matter, space, and time.

For our present purposes, I will focus on the so-called “measurement problem” in quantum mechanics, the structure of which bears a striking resemblance to the Buddhist problem of *vikalpa*. In both cases, exegetes argue about the role, if any, that “observation” (measurement, discernment, cognition) plays in the emergence of the world that is observed. (Is there a moon when nobody is looking?) For those unfamiliar with the quantum measurement problem, a bit of background is in order.

Let us start with the famous double-slit experiment, which is often used to illustrate wave-particle duality. If one directs a beam of light at a screen with two thin slits, the light passing through the slits produces an interference pattern on a second detection screen. This suggests that light is a wave: as the wave passes through the slits, it creates two wave trains that interfere with one another, creating the observed bands of alternating light and dark. Yet, if one lowers the intensity of the beam, one sees that the observed interference pattern is made up of individual particles (photons) hitting the detection screen in discrete locations. This is odd, as common sense tells us that the interference pattern must be created by light passing through both slits at once in the form of a wave. If, alternatively, the light passes through the slits as discrete particles, then the observed pattern must result from each individual particle passing through both slits at the same time, interfering with itself as it were. And this seems illogical. So it would appear that light behaves as a wave at one point in time and as particles at another. If this is true, when and how does the transition occur?

One way to determine what is happening is to decrease the intensity of the beam until only a single particle (photon or electron) emerges at a time and then set up a device adjacent to the slits to detect which slit the particle passes through. Curiously, when this is done, the interference (wave)

pattern is no longer seen on the detection screen; instead one sees two clumps of particles, one opposite each slit, which is what one would expect if the beam were composed of particles, each of which passes through only one slit at a time. So when you are not observing what is happening at the slits—when you do not know the “which-path” information—the beam behaves as a wave, propagating through both slits at once and creating an interference pattern. But if you choose to detect the which-path information, then the beam behaves as a stream of particles, each of which passes through only one slit, and the interference pattern is replaced by two clumps. In short, when you look, the beam is composed of particles, but when you are not looking, it behaves as a wave. Some physicists speak of the act of observation as triggering the “collapse” of the wave packet (also known as “state-vector collapse” or “wave-function collapse”), which produces a discrete particle. Whether this collapse is real, and if so, what to make of it, is the “measurement problem.”

One might suspect that the problem lies with the experimental set up, since it cannot be easy to observe a quantum particle without altering it in some fashion. Surely, the detection of anything as small as a single photon or electron is bound to effect it in some way. So perhaps there is nothing spooky about the act of measurement; the attempt to measure the particle is altering precisely what one is trying to measure. However, there are ingenious ways around this problem that allow physicists to determine the which-path information of a particle without interfering with it *locally*. For example, the observation can be performed on one half of an entangled pair that passes through the slit, thereby revealing the which-path information of the other half without observing it directly. And the results are always the same: if you know the which-path information, you get a clumping pattern, suggesting that the light consisted of particles when passing through the slits. But if you do not know the which-path information, you get an interference pattern characteristic of a wave. It would seem that simply *knowing* the which-path information causes the wave to collapse into a particle. And even stranger, you get a clumping pattern *even when the decision to observe the particle pass through the slits is made after the particle has already registered on the detection screen*. This can be demonstrated through the “delayed-choice quantum-eraser” double-slit experiments, which have been performed multiple times with consistent results. It is as if the particle knows ahead of time whether it will be observed, even if the observer does not. (This phenomenon, which is sometimes referred to as “retro-causality,” raises the issue at the heart of the Ābhidharmika and Mādhyamika debates on causation, namely, the metaphysical relationship between causality and time.)

The propagation of a quantum system through time can be modeled with precision by a linear, deterministic equation such as the Schrödinger equation, whose solution is known as the “wave-function” or “psi-function.” However, we never observe or measure the wave-function directly; we are only capable of detecting particles. These particles display determinate properties such as position, momentum, and spin. But these properties (their “eigenvalues”) cannot be known definitively *prior* to the collapse of the wave-function—there is a degree of randomness in what emerges upon collapse. The Schrödinger equation can only predict the *probabilities* that a particular value will surface when a measurement is taken. The wave-function can then be described as a “superposition” of multiple possible measurement outcomes, only one of which will appear when we interact with a quantum system.

The question then arises as to what, if anything, is there when we are not observing, or detecting, or interacting with a quantum system. Do formalizations such as the “wave-function” reference a mind-independent reality that transitions into discrete particles with determinative properties when we interact with it? Or is the Schrödinger equation simply a means of calculating the odds of what will appear when we go looking?

Niels Bohr and Werner Heisenberg famously took the latter “antirealist” view (or perhaps better, “correlationist” view; see below), and their position came to be known as the Copenhagen interpretation.²¹ According to them, the mathematical formulation of the quantum state—the wave-function—does not reference some mind-independent reality *per se* but is merely a theoretical or pragmatic tool that helps us predict the results of experiments. When we run up against indeterminacy and chance at the quantum level, it does not reflect our *ignorance* of what lies beyond our observational powers—it does not imply that quantum mechanics is incomplete. The world of quantum stuff *bottoms out* in randomness and indeterminacy, but this indeterminacy is only apparent at the quantum level as it requires a quantum system to be physically isolated—a state that is described as “closed.” Such isolation is possible in practice only when dealing with quantum-level phenomena. At the macro level—the “open” level of mundane daily life—the complex interactions of systems result in entanglements that reduce the randomness to near zero. As a result, the

²¹Strictly speaking, the term “Copenhagen interpretation” postdates Bohr; it was introduced by Heisenberg in 1955, although he had referred to the “*Kopenhagener Geist der Quantentheorie*” as early as 1930 (Heisenberg 1930, preface; Fuchs 2018). Moreover, some have questioned Heisenberg’s antirealist interpretation of Bohr’s position (Howard 2004). Nevertheless, in popular depictions of quantum theory, Bohr is closely associated with Copenhagen antirealism.

classical world of “medium-sized dry goods” appears relatively stable and predictable.

So according to the Copenhagen interpretation, it makes little sense for science to hitch its wagon to an objective and determinative ground—some observer-independent or noumenal world that perdures when we are not looking—since the “observer” (understood broadly) is always and necessarily implicated in whatever shows up. As such, “wave-function” and “particle” are merely two ways of conceptualizing abstract mathematical formalisms—two ways of predicting the results of scientific experiment. Note that Bohr and company arrived at their correlationist stance not through abstract philosophical reflection, but rather in their attempts to explain reproducible and widely accepted experimental data.

Albert Einstein and Erwin Schrödinger found this interpretation unacceptable. They insisted that the indeterminacy observed at the quantum level must simply reflect our ignorance of what is going on behind the scenes, and hence quantum mechanics is incomplete. The universe must be governed by immutable laws of cause and effect; hence, there must be some as-yet-undiscovered “hidden variables” that ultimately determine the observed properties of particles.

Einstein believed it possible to *prove* that quantum mechanics was incomplete. His argument is found in a famous 1935 paper, coauthored with Boris Podolsky and Nathan Rosen, entitled, appropriately enough, “Can Quantum Mechanical Description of Physical Reality Be Considered Complete?” Here the authors propose a thought experiment involving entangled particles, the point of which is to show that if quantum mechanics were indeed complete, we would either have to give up “local realism” or, alternatively, allow for superluminal (faster than light) communication between distant objects. As most physicists accept the theory of relativity, superluminal communication is ruled off the table. And it seemed obvious to Einstein that giving up local realism is a nonstarter—he could not abide what he called “spooky action at a distance” (*spukhafte Fernwirkung*). Einstein’s conclusion is that quantum mechanics is incomplete, that the world is deterministic, and hence there must be something hidden that we still do not understand lurking in the tissue of reality. The debate continued, somewhat unfruitfully, for several decades, as it was unclear how experimental evidence could help decide between the antirealist Copenhagen interpretation and the realist local-hidden-variables approach. That is, it appeared that both theories predicted precisely the same experimental outcomes.

Then, in 1964, John Stewart Bell published a remarkable paper titled, “On the Einstein-Podolsky-Rosen Paradox,” in which he showed that it was indeed possible, at least in theory, to design an experiment the result

of which had the potential to rule out local realism and with it local hidden variables. But it was not until 1972 that two physicists at Lawrence Berkeley Lab, John Clauser and Stuart Freedman, put Bell's theorem to the test. The results of their experiment showed a violation of "Bell's inequalities" that indeed ruled out local realism. Variations of the experiment have been run many times since in an effort to eliminate any possible loopholes, and always with the same results, dealing a blow to local-hidden-variable theories.²² The world of quantum mechanics has proven to be so profoundly baffling that many thoughtful scientists believe it a waste of time to try to make sense of it.

Still, quantum theorists and philosophers have not given up, and there are now over a dozen competing theories that try to make the quantum world intelligible. It is impossible to cover the theoretical landscape in this short article, but for our purposes the contending theories can be sorted into a few basic types. First, there are the antirealist theories, under which heading I would include various flavors of the Copenhagen interpretation, quantum information theories, Ithaca interpretation, relational quantum mechanics, and QBism. Then there are the realist theories that affirm the independent existence of the quantum state; here I would include pilot-wave theories such as the De Broglie-Bohm theory (a version of hidden variables) as well as the many-worlds interpretation. Third, there are what might be called dualist positions such as the Von Neumann-Wigner interpretation, which holds that consciousness and wave-function are both real and that consciousness brings about collapse. Finally, there are positions that try to bridge the gap by insisting there is no gap to bridge, in which I would tentatively place the currently popular decoherence theories.

Some insist that the term "antirealist" is misleading for the Copenhagen interpretation and its offspring, as these positions do not abandon "the real" *per se*, so much as they deny its ontological independence. The term "correlationist" might be preferable, as these positions agree that a complete description of quantum phenomena is impossible without taking into consideration the relation between—or the complementarity of—"quantum system" and "observer." Carlo Rovelli, who is associated with informational and relational approaches to quantum mechanics, puts it this way: "A quantum mechanical description of a certain system (state and/or values of physical quantities) cannot be taken as an 'absolute' (observer-independent) description of reality, but rather as a formalization, or codification, of properties of a system *relative* to a given observer. Quantum mechanics can therefore be viewed as a theory about the states

²²See, for example, Aspect 1999. Note that, strictly speaking, the Bell experiments do not rule out the possibility of non-local hidden variables.

of systems and values of physical quantities relative to other systems" (Rovelli 1996, 1648). David Mermin, a proponent of QBism, writes that "correlations have physical reality; that which they correlate does not"; as such, the fundamental problem of quantum mechanics is "how to make sense of correlations without correlata" (Mermin 1998, 754). Christopher Fuchs, another QBist, prefers the term "participatory realism" for the descendants of Bohr so as "to emphasize that rather than relinquishing the idea of reality (as they are often accused of), they are saying that reality is more than any third-person perspective can capture" (Fuchs 2016, 112). Although there are marked differences between these positions, they all agree that quantum theorists must let go of the metaphysical realist conceit that the task of science is to grasp the world from a god's-eye view. They are, then, akin to Madhyamika deflationists in their claim that (1) there is no stepping outside of ourselves since reality is intrinsically relational; ergo (2) our first-personal (or in Buddhist jargon, *samvṛiti* or "conventional") construals are as ultimate as it gets. Quantum mechanics is complete; there are no hidden variables.

The realists find the strong correlationist stance unacceptable. They believe that science must strive to be objective, and thus the empiricist emphasis on the manifest or phenomenal domain is misplaced. What is science if not an attempt to escape our perceptual limitations and arrive at a frame-independent description of reality that will explain, deterministically, why things appear to us as they do. Local-hidden-variable theories fell out of favor among the realists, having been called into question by the Bell inequality experiments, but non-local hidden variables show signs of making a comeback. (Bell himself was a realist and held out hope for a hidden-variable approach.) This approach is analogous to Yogācāra insofar as it postulates a hidden domain—think of the noumenal "storehouse consciousness" (*ālayavijñāna*) with its "seeds" (*bīja*)—to explain, in a deterministic fashion, the causal regularities we observe in the phenomenal world.

Of the few remaining realist options, the most popular may be the "many-worlds" hypothesis (also known as the Everett-Wheeler interpretation), which handles the measurement problem by denying collapse. According to many-worlds aficionados, the real or objective world is described by the wave-function, whose evolution through time is linear, deterministic, and unaffected by measurement or observation. When a "measurement" takes place, the multiple possible eigenvalues of the wave-function are *all* realized, resulting in multiple, branching universes that evolve independently of one another. These parallel but diverging universes can then be viewed collectively as superpositions of the single

universal wave-function. As every possible outcome of observation is realized, there is no collapse and no randomness—just endless branching.²³

When an early form of the multiverse idea was first proposed by Schrödinger in 1952, he acknowledged that it might “seem lunatic” (Bitbol 1996, 127). Yet today this somewhat bizarre and implausible-sounding theory has many adherents in the quantum-theory community. It is not difficult to understand the theory’s appeal: it is one way—some claim the only way—of preserving realism in the face of quantum-mechanical weirdness. There is a real objective world, governed by real, objective, deterministic laws, and thus there is no need for scientists to make room for squishy notions such as “observation” or “measurement” (much less “consciousness”) that are resistant to mathematical formalization. Indeed, the architect of the many-worlds theory, Hugh Everett, insisted that his interpretation was the “only completely coherent approach to explaining both the contents of quantum mechanics and the appearance of the world” (2012, 315). But a picture in which reality continually throws out an infinitude of new universes that evolve along their own diverging trajectories, forever sealed off from one another, seems a high price to pay to hold onto a classical notion of objectivity.

Today there are a variety of many-worlds theories, some of which are less realist than others. (There is even a “many-minds” version.) There is also a group of related interpretations known as decoherence theories, which explain collapse in terms of the entanglement of a system with its environment. Some proponents of decoherence consider the “real world” to be that of particles rather than that of the wave-function, and “observation” is simply another word for entanglement. This entanglement does not necessitate the presence of a conscious entity and does not spawn multiple alternative universes, but it does affect the way things appear locally. As such, decoherence theories might be seen as synthetic in that they aim to preserve both an objective, in-itself quantum world as well as the phenomenal, contingent way that things appear depending on one’s reference frame.

It is impossible (and well beyond the scope of my expertise) to do justice to these theories here.²⁴ It will suffice to note that science is often accorded the final word on the nature of the material world, and physics is the branch of science concerned specifically with the physical domain.

²³This is reminiscent, if only superficially, of Buddhist Tantra, in which the practitioner is taught to generate multiple alternative worlds. But the similarities do not extend to the underlying ontology; in the case of Tantra, movement among these worlds is, of course, possible, and the goal is precisely to undermine the conviction that any one of them—including the work-a-day “natural” (or, in quantum terms, “classical”) world in which we usually find ourselves—is ultimately real.

²⁴For an attempt to organize and “map” the competing theories, see Cabello 2017.

Quantum mechanics is the branch of physics that bores down into the elemental world of mass, energy, time, and space. Yet modern quantum mechanics finds itself ensnared in the same loop that Buddhist exegetes encountered centuries ago, and like the Buddhists they spin out multiple competing theories that run the gamut from realist to antirealist and back again. This suggests that the loop does not simply bespeak the limitations of our conceptual and linguistic capacities but is woven into the very fabric of our world.

CHAN CASES

The problem seems to be intractable. There is no way to extricate oneself from the loop, no way to view it from the outside, since the way out invariably places one back inside. It is like a Möbius strip or the infinite loops depicted in Escher's prints "Ascending and Descending" (1960) and "Waterfall" (1961), except that when we imagine a Möbius strip or one of Escher's illusions, we are seeing them from the outside, occupying a detached vantage point from which we grasp them holistically as *objects*. And this is what we cannot do with the loop, just as we cannot do it with our own subjectivity. How then can we possibly signify or characterize it?

This is by no means a new problem. Indian philosophers, notably those associated with Madhyamaka and Advaita Vedānta, wrestled with it, as did Schopenhauer, K. C. Bhattacharyya, Wittgenstein, Husserl, Heidegger, and Merleau-Ponty, to name just a few.²⁵ All of them push up against paradox, but few are willing to openly embrace dialecticism—to accede to the possibility that the contradictions they encounter may be true. In this respect, Chinese Chan is unusual.

Chan emerged within an intellectual tradition that was more amenable to taking paradox seriously. Chinese intellectuals were steeped in the writings of Zhuangzi 莊子 and Laozi 老子 and their commentators Guo Xiang 郭象 (d. 312) and Wang Bi 王弼 (226–49), all of whom regarded paradox as valuable, if not indispensable, to philosophical reflection. As such, Chinese Buddhist exegetes were often drawn to paradox, which they readily discerned in the Mahāyāna canon. One notable early example is the influential Buddhist commentator and student of Kumārajīva, Sengzhao 僧肇 (384–414), whose interest in the paradoxical formulations of the Prajñāpāramitā corpus is evident from the titles of his essays alone: "Wisdom (*Prajñā*) Is Without Knowing" (*Bore wuzhi lun* 般若無知論), "Things Do Not Change" (*Wu buqian lun* 物不遷論), and "Nirvāṇa Has No Name" (*Niepan wuming lun* 涅槃無名論). However, Sengzhao's

²⁵See the references in note 7 above.

writings tend toward the literary and evocative, and do not always evince an awareness of the substantive philosophical controversies that drove Buddhist disputation in India. Like other exegetes of the Six Dynasties period, Sengzhao assumes that there are no *fundamental* points of contention between various Indian Buddhist schools and that inconsistencies in the textual sources simply bespeak the unavoidable need for “skillful means.” (Simply stated, awakened sages will tailor their message to the specific needs and aptitudes of the audience at hand.)

As Buddhist scholarship evolved in China, exegetes developed a more sophisticated and confident grasp of Indian Buddhist doctrine. By the eighth century, when Chan comes into being, scholiasts had come to fully appreciate the tension between (1) the deconstructive, deflationary, and correlationist readings of Madhyamaka, which tend to regard “emptiness” as a meta-statement about the contingency of all statements, and (2) the transcendentalist strands of Yogācāra and Tathāgatagarbha thought, which identify emptiness with *dharmadhātu*, *tathatā*, buddha-nature, *ālayavijñāna*, et cetera. And Sui and early Tang Chinese scholiasts, notably those associated (often after the fact) with the Sanlun 三論 and Tiantai traditions, had already produced a voluminous literature in which they make repeated use of the fission and fusion gambits to try to manage this tension (Deguchi et al. 2021).

The Chan tradition can be seen as a response to the debates between realist and antirealist positions and at the same time a repudiation of scholastic attempts to neutralize the problem through hermeneutic machinations. The *Platform Scripture of the Sixth Patriarch* (*Liuzu tan jing* 六祖壇經)—one of the most important documents of early Chan—depicts its hero, Huineng 惠能 (638–713), championing the antirealist, correlationist teachings of the *Vajracchedikā-prajñāpāramitā* over the realist, luminous-mind teachings of the *Laṅkāvatāra*. In the famous “poetry contest,” Huineng rejects the luminous-mind (“clear-mirror”) interpretation proffered by his rival Shenxiu 神秀 (606?–706) in favor of a more deconstructive approach that careens, throughout the text, between *Prasaṅgika deflationism and transcendentalist mindlessness.²⁶ Note also that the text conveys its message as much by its literary style and narrative conceits (the patriarch Huineng is depicted as an illiterate, lay commoner) as by its expository claims. Like other early Chan texts, the *Platform Scripture* dispenses with scholastic hermeneutic stratagems such as fission and fusion in favor of a more direct, immediate, and personal style befitting the new “sudden teaching.”

²⁶On the problems in parsing the *Platform Scripture*’s understanding of “buddha-nature,” see Sharf 2017.

The *Platform Scripture* depicts the Chan of Huineng's time as locked in a struggle between two distinct camps: the gradualist Northern school, and the subitist Southern school. However, we know from Dunhuang documents and the writings of contemporary witnesses such as Guifeng Zongmi 圭峰宗密 (780–841) that the situation on the ground was more complicated, and that many schools, each with a unique approach to the problem, were vying for attention. The Baotang line based in Sichuan, following a logic reminiscent of *Prasāṅgika, opted for a radically deflationist strategy in which the goal of practice is to see that there is no goal. According to some sources, this led some Baotang adherents to abandon monastic ordination and ritual practice altogether. In contrast, some Oxhead and Hongzhou lineage teachers espoused diverging transcendentalist positions predicated on mindlessness in contrast to the luminous-mind transcendentalism popular among East Mountain and Northern lineages.²⁷ In short, the increase in lay Buddhist devotion to, and patronage of, eminent Chan masters made the mid-Tang a particularly fertile period for doctrinal and literary innovation. This led to vigorous debates that focused on the very heart of Buddhist teachings—on the meaning and possibility of freedom from causality—in which Chan teachers found themselves running up against the same loop that befuddled early Indian Buddhist scholiasts and modern quantum theorists alike.

The end result of these experiments is the distinctively dialectic Chan popular among Buddhist elites in the Song and Yuan periods. This mature form of Chan, drawing on the Chinese literati affinity for paradox, is associated with distinctive forms of ritual life and intellectual training, including the new literary genre of *gong'an* 公案 or “public cases” (Japanese: *kōan*). These *gong'an*, which consist of extracts from the sayings of famous Chan figures coupled with layers of cryptic commentary in prose and verse, are designed to allow aspiring Chan students to come to grips with, and give expression to, the loop without trying to tame it.²⁸ This is why *gong'an* literature seems, at first glance, so eccentric.

More specifically, *gong'an* were used to guide elite disciples—disciples in line for an abbacy (*rushi dizi* 入室弟子)—in how to handle, in their literary compositions, in debate, and in formal public lectures, the seminal antinomies that run through and structure Mahāyāna thought, including conventional/absolute, ignorance/awakening, contingency/

²⁷On the Baotang lineage, see esp. Adamek 2007; on the Oxhead school, see McRae 1983; on the Hongzhou school, see Jia 2006 and Pocesi 2007; and on the Northern school, see McRae 1986.

²⁸I have dealt with these issues at length elsewhere, so my treatment here will be brief. On medieval Chan ritual, see Sharf 2005; on the intellectual training of elite Chan monastics in the Song period, see Sharf 2007.

freedom, speech/silence, sentience/insentience, and so on. They do so not by positing a medial or transcendental position that sublates or resolves the antinomies. Instead, *gong'an* training compels the student to *embody* the contradiction in word and in deed. Rather than trying to subdue the loop, one learns to dance with it.

As I have addressed elsewhere, the use of *gong'an* in Song and Yuan monastic training, I will give only a single example here, namely, Baizhang Huaihai's 百丈懷海 (749–814) "Wild Fox," which is case no. 2 of the *Wumenguan* 無門關.²⁹ This case is particularly apposite as it returns us to the problem of contingency, causation, and the two truths. The question, in short, is whether escape from correlationist contingency is ultimately possible or not.

Whenever Baizhang delivered a sermon, an old man always followed the assembly in order to listen to the teaching. When the assembly left, the old man left too. Unexpectedly, one day, he remained behind. The Master asked him, "Who are you, standing in front of me?" The old man replied, "Indeed, I am not a human being. In the past, in the time of Kāśyapa Buddha, I lived on this mountain [as a Chan teacher]. On one occasion a student asked me, 'Is a person of great accomplishment still subject to cause and effect or not?' I answered, 'He is not.' [Because of my answer] I was reborn as a fox for five hundred lifetimes. I now ask you, Master, to say a transformative word on my behalf to free me from this fox body." He then asked, "Is a person of great accomplishment still subject to cause and effect or not?" The master answered, "He cannot evade cause and effect." Upon hearing these words the old man immediately understood. Making a bow he said, "I have now been released from the fox, whose body remains behind on the other side of the mountain. I have presumed to tell this to you, and now request that you perform a funeral for me as you would for a deceased monk." ... That evening [after performing the funeral for the fox] the Master convened an assembly and related the circumstances [of the funeral]. [His disciple] Huangbo then asked, "The old man, failing to respond correctly, was reborn as a fox for five hundred lifetimes. Suppose that, time after time, he made no mistake; what would have happened then?" The master said, "Come closer and I'll tell you." Huangbo approached [Baizhang] and gave the master a slap. The master clapped his hands and laughed saying, "I had supposed that the barbarian had a red beard, and now here is a red-bearded barbarian!"

²⁹My discussion of Baizhang's "Wild Fox" draws directly from the discussions in Sharf 2007, 226–28; and Sharf 2021, 99–102.

百丈和尚凡參次，有一老人常隨衆聽法。衆人退，老人亦退。忽一日不退。師遂問：面前立者復是何人。老人云：諾，某甲非人也。於過去迦葉佛時，曾住此山。因學人問：大修行底人還落因果也無？某甲對云：不落因果。五百生墮野狐身。今請和尚代一轉語，貴脫野狐。遂問：大修行底人，還落因果也無？師云：不昧因果。老人於言下大悟。作禮云：某甲已脫野狐身住在山後。敢告和尚，乞依亡僧事例。。。。師至晚上堂，舉前因緣。黃蘗便問：古人錯祇對一轉語，墮五百生野狐身。轉轉不錯，合作箇甚麼？師云：近前來，與伊道。黃蘗遂近前，與師一掌。師拍手笑云：將謂胡鬚赤；更有赤鬚胡。³⁰

At first glance, this rather odd tale seems far removed from the concerns that animate debates between the Vaibhāṣikas and Sautrāntikas, or between the Mādhyamikas and Yogācārins, or between the supporters of the Copenhagen interpretation and the supporters of many-worlds. But let us take a closer look.

Buddhist doctrine holds that Buddhist practice leads to *nirvāṇa*—to freedom from causation and to escape from the karmically determined cycle of life and death. In Mahāyāna, this freedom is associated with the attainment of *nirvikalpa*, with emptiness, and with buddhahood itself. The “orthodox” response to the initial question would then seem to be straightforward: of course, the person of great accomplishment—an awakened sage—is free of causation. Why else would one embark upon and undertake the rigors of the Buddhist path? Yet precisely because the old man gave this scripturally sanctioned response, he found himself bound to the cycle of life and death. Where did he go wrong?

The early Buddhist tradition struggled to explain how any kind of causally conditioned (*saṃskṛta*) activity could possibly lead to an uncaused, unconditioned (*asaṃskṛta*) state such as *nirvāṇa*. Arguably, they were never able to offer a logically coherent and conceptually compelling solution to this conundrum, which opened the door for Nāgārjuna’s intervention. The first chapter of Nāgārjuna’s *MMK* focuses on the issue of causality and argues that we can neither affirm nor deny causation, since the notion of causation is itself empty—it is merely a nominal entity and thus lacks a referent in some real, mind-independent world. And this is where the old man went wrong—the questioner is asking for a liberating truth, but the old man’s conventional response merely reinforces the false dualisms of contingency and freedom, *saṃsāra* and *nirvāṇa*. As a result, he is reborn in the body of a fox for five hundred rebirths.

³⁰T.2005: 48.293a15-b3; see also Case 8 in the *Congrong lu* 從容錄.

The challenge, it seems, is to respond to this testing question from the perspective of the absolute. But how is one to do this given that the absolute will not brook any distinctions? Indeed, the very notion of an “absolute truth” is merely another conventional posit. To respond in *any* fashion—including with mute gesture or serene silence—will not suffice, since any signifying activity, including the attempt to signify the absence of signification, remains in the domain of the conventional. There is no outside.

And this is precisely the response that Baizhang provides the old man. Baizhang claims that even the awakened sage cannot ignore causation.³¹ This is a stunning assertion coming from a Buddhist master. To assert that there is no final escape from karma is tantamount to declaring that there is no *nirvāṇa*, no buddhahood, no end to life and death. Yet it is precisely this answer—the strong correlationist insistence that there is no freedom from contingency—that frees the old man from contingency. The paradox is thus made explicit: if you claim liberation is possible, it is not. If you claim it is not possible, it is. This is how Baizhang teaches the old man to dance with the loop.

After Baizhang has finished with his story, his disciple Huangbo responds with a challenge of his own: what would have happened had the old man, when first asked, given the answer that eventually liberated him? What if he initially responded with the doctrinally “incorrect” answer that, in the end, there is no final escape from causation? After all, it would seem that the answer that liberated the fox—that even realized beings cannot ignore karma—is itself contingent. Its liberative force lies in the manner that it undoes the answer previously given, namely, that liberation is indeed possible. Huangbo is raising the specter of radical contingency (or perhaps, “trivialism”)—that there is, in the end, no determinant truth of the matter, and thus, ultimately, both answers are equally true and equally false. In response to this challenge, the master invites Huangbo to approach the dais. Those versed in Chan literature know what to expect next: the master will strike the student, bringing closure to the exchange if not to the loop. But in yet another reversal, the student, Huangbo, manages to get his strike in first. Baizhang, delighted, offers Huangbo the ultimate compliment, using a pun to associate him with both the wily red fox of the story and with the mythological founder of Chinese Chan, Bodhidharma—two inveterate tricksters. The Chan adept must learn to live the loop and roll with the punches.

³¹Zhaozhou employs the same strategy in Case 1 of *Wumenguan*, in which he categorically denies that dogs have buddha-nature; see Sharf 2007.

CONCLUSION

Many of the great debates in contemporary philosophy—between idealism and realism, between nonconceptualism and conceptualism, and so on—seem to share a similar underlying structure, namely, the paradoxical looping structure that I have tried to identify above. Medieval Buddhist scholiasts in both India and China wrestled with the same loop as do quantum theorists today. With a few notable exceptions, philosophers try to get a grip on the loop by hitching their cart to one of two horses. The first is the antirealist or idealist horse that privileges the manifest domain—there is no world to speak of apart from that which shows up for someone, and thus it makes no sense to conjure the existence of a moon when nobody is looking. The second is the realist or physicalist horse that privileges the world—there is no mind in the absence of a world, and thus the moon is there irrespective of whether anyone notices it or not. That both positions are ultimately true is a claim that is rarely made, much less taken seriously. But given that the loop seems irrepressible and that two thousand years of philosophical debate in both East and West have done little to settle it in favor of one side or the other, perhaps it is time to take the Chan position seriously, namely, that paradox is an ineliminable feature of our world.

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