

Research Article

Being-Time, or How Traditional Japanese Thought Collided with Western Philosophy and Modern Physics at Hiroshima

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Abstract

The atom bomb that annihilated Hiroshima, Japan, on August 6, 1945, proved Albert Einstein's theory of relativity. Mass became energy and the classic Western dialectic of three-dimensional space and linear time was displaced by the integrated concept of spacetime. On that day, modern physics also collided with the traditional Japanese understanding that space and time are interdependent phenomena. This collision speaks to conceptual parallels relating Buddhist thought, modern Japanese philosophy, phenomenology, and the physics of spacetime. The thirteenth-century Zen Buddhist monk Dōgen said that all phenomena are made possible by the universal principle of emptiness and that our existence arises with each moment in what he termed Being-Time, where past, present, and future co-exist. The Japanese philosopher Nishida Kitarō, along with Tanabe Hajime and Watsuji Tetsurō, saw reality as a multi-dimensional field of space-in-time where the individual subject no longer stood apart from the objective world but instead arose dynamically as contingent activities rather than an autonomous thing. The German philosopher Martin Heidegger rejected the rational binary of subject and object in Western thought and grounded our "being" in phenomena that came from their temporal being-in-the-world rather than representing some preexisting objective reality. The physicist Albert Einstein radically rethought the dialectic of three-dimensional space and linear time, used to schematize the physical world in the West since antiquity, and theorized the relativity of spacetime, in which all phenomena occur in space in relation to their place in time. Interwoven, these intellectual threads stripped the bombing of Hiroshima of its historical inevitability. The story of human experience lost its customary sense of going *somewhere* predetermined and was revealed instead to be an endlessly discrete accumulation of moments that could go *anywhere* at every transient and directionless moment in time.

Keywords

Hiroshima, Atom Bomb, Buddhism, Japanese Philosophy, Western Philosophy, Phenomenology, Modern Physics, Spacetime Relativity

1. Introduction

When an atomic bomb named Little Boy detonated a few seconds after 8:16 AM on August 6, 1945, the city of Hiroshima (広島) ceased to exist. Three-dimensional space col-

lapsed to a single point in time and the cultural memory of a nation was split into an irrevocable *before* and *after* [1]. In *Japan-ness in Architecture*, the architect Isozaki Arata (磯崎

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Received: 28 July 2024; **Accepted:** 11 September 2024; **Published:** 29 September 2024



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新)¹ called this “the end of history” and said that it made Hiroshima “the indelible origin of the reconstruction process” for Japan [2]. The escape from history had special significance for the country whose unprecedented fate was to see two of its cities levelled by nuclear weapons. There was no going back when everything had changed.

Hiroshima’s fate as the first city in the history of the world to be destroyed by a nuclear weapon is well known. But we in the West are less aware of how Hiroshima continues to haunt the Japanese. If, as Isozaki claimed, the history of Japan began again from zero on August 6, 1945, this is not because the nation abandoned its past for a promise of future progress. In a tragic paradox, the practical demonstration of Albert Einstein’s spacetime physics found common ground that day with the traditional Japanese understanding that space and time are interdependent phenomena. How this interdependence has been understood in Japan is mapped in this article by an analysis of parallels between Buddhist thought and modern Japanese philosophy, the phenomenology of Martin Heidegger, and the physics of Albert Einstein.²

2. Buddhism and Japanese Philosophy

“Philosophy” (*tetsugaku* 哲学) reached Japan from the West. *Tetsugaku* is a neologism, coined in 1867–1874 by Japan’s first modern philosopher, Nishi Amane (西周) [4]. It literally means “wisdom” (*tetsu* 哲) “study” (*gaku* 学), telling us that Greek *love*—the *philo* (φίλο) of philosophy—had become Japanese *study*. The Westernized term displaced the older Japanese term, *shisō* (思想), which means “thought” and refers both to thinking generally and to systems of thought.

Nishi studied in the Netherlands, promoted the empiricism of the French positivist Auguste Comte, and meant to distinguish a Western discipline going back to ancient Greece from Eastern traditions of Daoist, Confucian, and Buddhist thought [4]. Japanese philosophers focused on mastering Western logic until Nishida Kitarō (西田幾多郎) reset this imported mode of reasoning on the Eastern and specifically Buddhist foundations discounted by Nishi [5]. After undergraduate studies at Tōkyō Imperial University and an early career as an instructor in preparatory high schools, Nishida joined the philosophy department of Kyōto Imperial University in 1910. Named the first chair in the history of philosophy in 1914, he recruited like-minded faculty into what later became known as the Kyōto School (Kyōto Gakuha 京都学派) [6]. Tanabe Hajime (田辺元) was hired in 1919 and succeeded Nishida upon his retirement in 1928, while Watsuji Tetsurō (和辻哲郎) joined the department in 1925, after undergraduate and graduate studies at Tōkyō University;

Watsuji remained in Kyōto until he returned to Tōkyō in 1934 to hold its chair in ethics [7]. Nishida, Tanabe, and Watsuji each combined in their philosophy Western *sophia* (σοφία), the Greek term for wisdom, with Eastern *prajñā* (*hannya* 般若 in Japanese), the Sanskrit term for wisdom in Mahāyāna Buddhism. Where *sophia* is the wisdom that comes from rational knowledge, *prajñā* is the wisdom that comes from experiential insight. Rather than rely on the formal, *a priori* axioms of Western logic, reasoning is based in the inferential methods of Buddhist logic (*inmyō* 因明).

Nishida was a contemporary and friend of Suzuki Daisetsu [Teitarō] (鈴木大拙 [貞太郎]), the author and teacher who played a fundamental role in bringing Zen Buddhism to the West. In 1891, Suzuki introduced Nishida to Zen meditation at Enkakujī (円覚寺) in Kamakura, where he was studying under its abbot. Nishida brought to his philosophy both a respect for Zen and a faith in the Buddhist principle that all phenomena are fundamentally empty. Tanabe also began with Zen, although his allegiance emigrated over time to the Pure Land School of Buddhism (Jōdoshū 浄土宗). Watsuji likewise practiced Zen meditation and put emptiness at the heart of his philosophy, even if he was drawn less to the metaphysics of experience that engaged Nishida and Tanabe than to social ethics.

In 1925–1926, Watsuji reintroduced to modern Japan a thirteenth-century Buddhist thinker and neglected Zen master with his biography of *The Monk Dōgen* (*Shamon Dōgen* 沙門道元) [8]. Dōgen means “origin” (*gen* 元) of the “path” (*dō* 道). Trained in Kyōto in the Tendai School of Buddhism (Tendaishū 天台宗), he spent two years studying Chan (Zen 禅) Buddhism in China before returning to Japan in 1227 to teach a growing number of followers until his death in 1253. The core lessons of what later became the Sōtō School of Zen (Sōtō Zenshū 曹洞禅宗) were laid out in Dōgen’s talks to his students and collected in the *True Dharma Eye Treasury* (*Shōbōgenzō* 正法眼藏) [9, 10]. Watsuji recognized Dōgen as Japan’s first native philosopher and translated the *Shōbōgenzō* into modern Japanese in 1929.

Dōgen’s teaching revolved around the principle of emptiness that makes existence possible in Buddhist thought. Because any *thing*—whether material or conceptual—can only arise from absolutely nothing at a particular place in time, no thing can preexist its realization in the present moment and cannot be predetermined. Using a homophone for “moon” (*tsuki* 月), Dōgen wrote poetically in “Complete Fulfillment” (*Tsuki* 都機): “The true form of Buddha is universal emptiness (*kokū* 虚空); and it is like the moon reflected on water ... All wisdom, all worlds, all phenomena are universal emptiness” [9]. Translated as “universal emptiness,” *kokū* literally means “empty space” or “sky.” The moon reflected on water is an image of the Buddhist “ten thousand things” that arise from nothing in our empirical world to represent the uncountable diversity of the universe.

1 The Japanese practice of placing the family name first and the personal name last is followed here.

2 This article is drawn from *The Hyospace of Japanese Architecture* [3].

In “Being-Time” (Uji 有時), Dōgen explained how emptiness allows our existence in time: “‘Being-time’ means that time is being ... ‘Time is existence. Existence is time’ ... We cannot be separated from time ... in reality, there is no coming and going in time, when we cross the river or climb the mountain we exist in the eternal present of time; this time includes all past and present time ... Yesterday’s time is experienced in our present experience ... being-time is not dependent on ideas; it is the actualization of being” [9]. Containing its own past and present, each moment is independent of every other moment and therefore omnidirectional. Instead of linear time headed in one direction from past to present to future, time atomizes into distinct moments that each by itself can move “from today to tomorrow, from today to yesterday, from yesterday to today, from today to today, from tomorrow to tomorrow” [9]. Time spreads across time in a field of possibilities that extend in every direction.

Being-time co-exists with the space in which phenomena arise: “The eternal present includes limitless space; there is nothing besides this” [9]. Our experience of time and space is unified by the constant impermanence of phenomena arising from nothing in each new moment. In “Universal Emptiness” (Kokū 虚空), Dōgen said that the principle and the phenomenon of space are distinct yet interdependent, because the first makes the second possible in the unity of this moment: “When you sit in *zazen* facing a wall, it appears that the sitter and the wall are two different things, but actually they are not separate. In order to understand this we need the mind of ‘wall, tiles, and stones’ [i.e., the ‘everyday mind’ of *heijōshin* 平常心 that is only concerned with the moment] ... the mind of universal emptiness” [9]. You and the wall are united rather than divided by the empty space in between.

Emptiness is manifested in the “suchness” (*tathātā* in Sanskrit, *immo* 怎麼 or *shinnyo* 真如 in Japanese) of existence. In “The True Form of All Things” (Shohōjissō 諸法實相), Dōgen characterized the suchness of all “phenomena” (*dharma* in Sanskrit, *hō* 法 in Japanese): “True form is all *dharma*s. All *dharma*s are the form of suchness, the nature of suchness—the suchness of body, the suchness of mind, the suchness of the world, the suchness of clouds and rain; the suchness of moving, standing, sitting, and lying, the suchness of sadness and happiness, movement and calm ... the suchness of pine and bamboo” [9]. We are a part of this world of suchness from which we arise and on which we depend.

Our embeddedness in the world led Dōgen to question the claim that “all sentient beings *have* Buddha-nature” (*issai shujō shitsū busshō* 一切衆生悉有仏性). He countered that all “beings” (*shitsū* 悉有) *are* Buddha-nature, insisting in “Buddha-nature” (Busshō 佛性) that “We should question [the Patriarch Ryōzan Enkan 梁山緣觀] and test him like this. We should research that he does not say ‘All living beings are the buddha-nature itself,’ but says ‘All living beings have the buddha-nature.’ He needs to get rid of the *have* in

‘have the buddha-nature’” [10]. Dōgen replaced the duality of *having* a Buddha-nature that remains separate from our *being* with a nondialectical condition of *being*, where what we *have* is indistinguishable from what we *are*.

Abe Masao (阿部正雄)—a graduate student in philosophy at Kyōto University in the 1940s—alerts us in *Zen and Western Thought* to a nuance that gets lost in translation. Dōgen’s questioning of the patriarch turns on a double reading of the verb *aru* (有る): the phrase *shitsū busshō* (悉有仏性) can be read as both “to *have* Buddha-nature” and “to *be* Buddha-nature.” [11]. Where the patriarch set the subject of being apart from the object of Buddha-nature, Dōgen united the two in the equation “to have = to be” that makes subject and object interchangeable. The same *aru* gives rise to being-time, where it is the “u” of *uji* (有時). Everything in the phenomenal world is a manifestation of the suchness of Buddha-nature because the world of which we are a part is itself Buddha-nature.

Nishida reflected on what he learned from Dōgen in “Basho” (場所), a book-length essay on human consciousness written in 1926 [12]. *Basho* means “place” and is used here to define human consciousness as a *field of* time and space rather than a *thing in* time and space. The two *kanji* of *basho* identify two kinds of place. 場 (*ba*) signifies place as an area of ground or open space, as in *hiroba* (広場), the word for “plaza” that literally means “wide area.” 所 (*sho* or *tokoro*) signifies an inhabited place where things happen over time: *jūsho* (住所), the word for “address,” is the place where someone lives; *daidokoro* (台所), the word for “kitchen,” literally means the “platform place” where food is prepared. The sense that what a place *is* comes from what it *does* speaks to the performative nature of Japanese language and space.

For Nishida, as Yusa Michiko (遊佐 道子) explains in *Zen and Philosophy*, the self-determination that constitutes the individual “I” of consciousness resulted from “predicate logic” (*jutsugoteki ronri* 述語的論理) instead of the Aristotelian “logic of the subject” (*shugoteki ronri* 主語的論理) [13]. Where the subject in traditional grammar is composed of pronouns, nouns, or noun phrases that are placed before the verb and determine its meaning, predicates in traditional grammar are the verbs and objects in the second half of a sentence that modify or determine the meaning of the subject in the first half. In “Basho,” Nishida located the *self* of predicate logic “topologically” (*bashoteki* 場所的) as a field of consciousness where any subject exists and is defined in relation to its context. The self is not an autonomous thing: “Ordinarily we ... think of the ‘I’ to be a unity as a subject possessing various qualities like a thing. But the ‘I’ is not a unity *qua* subject. It must instead be a predicating unity. It would have to be a circle rather than a point, a *basho* rather than a thing.” [13]. Because a subject depends on its environment, Nishida qualified the *basho* as “perilous”

(*hōronriteki* 方論理的), the logic *around* a thing rather than *of* the thing itself [12]. Things only exist in relationship to a place: “We have no choice but to think of that which *is* as being emplaced in something” [12].

Nishida tackled the Western syntax of subject-verb-object in order to undermine the Western assumption of objectivity. The subject-object dualism of an individual subject who stands apart from the objective world is decentered across a void, where being arises from nothing according to the Buddhist principle of emptiness. The Western tendency to objectify things is solidified in the grammatical subject but dissolves in a language like Japanese that is not structured around subject-object dichotomies. When words can be both a noun and a verb, consciousness shifts from object/thing to action/act: “In the *basho* of nothing that negates all being, to act (*hataraku* 働く) is simply to know and to know is to mirror” [12].

The field of consciousness in which we act is simultaneously spatial and temporal. In place of the classic Western binary of three-dimensional space versus linear time, we find a dynamically interdependent condition of space-in-time. Space is understood to be both the universal condition of emptiness from which all phenomena arise and the local circumstances that come into being with our own arising in that space: “Everything that appears, appears in space, and space becomes the immanent *basho*” [12]. Time is the infinity of moments that arise from nothing, each of which negates itself to make way for the next. This produces the “eternal now” (*eien no ima* 永遠の今) of a present whose own past and future are present in that moment: “One can say in consciousness, the past is the past emplaced in the present, the present is the present emplaced in the present, and the future is the future emplaced in the present. The so-called present is the shadow of the present mirrored in the present” [12]. The constant self-negation of a present that makes way for the non-present at once spatializes time as the place in which things happen and creates the flux of time experienced as historical change [12].

3. Japanese Philosophy and Western Phenomenology

Nishida brought a wide knowledge of Western philosophy to his lifelong Buddhist practice, paying special attention to the German school that runs from the idealism of Immanuel Kant and Georg Wilhelm Friedrich Hegel to the phenomenology of Edmund Husserl and Martin Heidegger. While he never traveled outside Japan, Tanabe and Watsuji both went to Germany on scholarships. Tanabe studied with Husserl and was tutored by Heidegger in 1922–1924, and Watsuji was in Berlin when Heidegger’s *Being and Time* (*Sein und Zeit*) was published in 1927 [14]. One of the first Japanese philosophers to read this work, Watsuji played a direct role in bringing Heidegger’s phenomenology to Japan, where his revolution-

ary rethinking of the nature of experience proved to be as consequential as it was in the West.

Nishida, Tanabe, and Watsuji were drawn to Heidegger’s thesis that “being” is a phenomenological condition at odds with the rational dualism of Western thought. For Heidegger, a philosophical tradition that encompassed the dialectical logic of ancient Greece, the modern rationalism of René Descartes, the critical idealism of Kant, and the dialectical synthesis of Hegel had failed “to achieve clarity regarding its own history” [14]. He attributed this failing to the persistent habit of splitting of the world into subject and object, a binary analyzed in Descartes’ *Discours de la méthode* (*Discourse on Method*, 1637) and *Principia philosophiae* (*Principles of Philosophy*, 1644) and epitomized by his proposition of *cogito ergo sum*: I think therefore I am [14, 15]. Distinguishing the *res cogitans*—the realm of the mind or thought—from the *res corporea*—the realm of the body—Descartes had defined both realms as substances whose characteristics are seen as inherent and self-evident because created by God. The conceptual or subjective realm is the self-evident clarity of thought recognizing its own existence. The corporeal or objective realm is the self-evident space of *res extensio*, the extensions of length, breadth, and depth that describe the three dimensions of physical objects in the world and justify the Cartesian coordinates of modern mathematics.

Heidegger saw these categories as a dodge around an obvious problem. Descartes had resorted to an “idea of substantiality which is not only unexplained ... but is also declared to be inexplicable” when he defined a substance by its supposed characteristics while crediting the substance of finite and created beings to an infinite and uncreated god [14]. He had invented a “prediscovered isolated subject” who presupposed in turn an objective external world [14]. For Heidegger, such *a priori* reasoning ignored the world and evaded the question of being.

What Heidegger called *Dasein* literally means “being there” and is defined variously as “the being of a being,” “being in the world,” being “entangled in the world which it is,” “taking up relations to the world,” and being “grounded in the familiarity with the world ... which, in its turn, constitutes *Dasein*’s understanding of being” [14]. Being-in-the-world can only be explained with a philosophical method that recognizes phenomena to be things “*established as what shows itself in itself*” [14]. This thing that “shows itself in itself” is not the *a priori* “thing-in-itself” (*Ding an sich*) described in Kant’s *Prolegomena to Any Future Metaphysics* (1783) [16]. Kant contended that all phenomena represent preexisting ideal objects, the “thing-in-itself,” which is independent of observation and hence can be *thought of* but never *known* directly. We can only know the world phenomenally. Kant reasoned, however, that we can determine the world’s inherent order by using our own innate, *a priori* capacity to reason.

Heidegger answered back that any “thing” must and can only show itself in itself because all phenomena, including knowledge, come from their being in the world. They do not

stand for, do not represent, some preexisting reality that is merely appearing in this or that phenomenon: “Essentially, nothing else stands behind the phenomena of phenomenology” [14]. What we take to be an external, objective reality is nothing more than “modes of reality,” phenomena of being-in-the-world that disclose their own truth: “The claim that there are ‘eternal truths,’ as well as the confusion of the phenomenally based ‘ideality’ of Dasein with an idealized absolute subject, belong to the remnants of Christian theology ...” [14].

Being comes down to the individual self: “Dasein is the being which I myself always am” [14]. Bound by birth and death, the “I” of being is temporal rather than spatial: “The being of Dasein finds its meaning in temporality (*Zeitlichkeit*)” [14]. This temporality is based in the present moment, which exists independently of other moments and contains both its own past as the “now no longer” and the future as the “now not yet” [14]. Time is shaped by this episodic discontinuity: “In this succession of experiences only the experience that is present ‘in the actual now’ is ‘really real’ (*eigentlich wirklich*). The experiences past and just coming ... are no longer or not yet ‘real.’ Dasein traverses the time-span allotted to it between the two boundaries in such a way that it is ‘real’ only in the now and hops, so to speak, through the succession of nows” [14]. Across these successive hops in time, the individual perseveres from moment to moment: “The self maintains itself in a certain sameness throughout this constant change of experiences” [14]. Heidegger admitted the “spatiality of being-in-the world” as a locational phenomenon of place, but space remained secondary to this temporal sense of self. Things were dynamically at hand in “the paths and ways of everyday things” and not something “ascertained and catalogued by the observational measurement of space” in the Cartesian sense [14].

Read from the perspective of Mahāyāna Buddhism as interpreted by Dōgen, Heidegger’s *Being and Time* had much to recommend itself to Japanese philosophers. Being was defined as a temporal condition that arises from the phenomenon of existing in the world rather than from some abstract, *a priori*, and objective reality. Rational dichotomies of subject and object, mind and body, were rejected for the unity of existence in this moment where time incessantly starts over and past, present, and future co-exist. Yet Nishida, Tanabe, and Watsuji parted ways with Heidegger in his identification of the individual self as the primary criterion of experience. His contention that the self persists through time was fundamentally at odds with their Buddhist awareness that any such continuity was impossible when the world and everything in it starts over with each new moment. Treating the human being both as a phenomenon that maintains its sense of self through time and as an individual who can act independently of a context, Heidegger understood being as an embodied *thing* rather than a *place* from which everything arises, as “being-in-the-world” instead of Nishida’s *basho*.

Watsuji answered Heidegger in his most famous work,

Climate: A Study of Human Knowledge (*Fūdo. Ningen gakuteki kōsatsu* 風土. 人間学の考察, 1935) [17]. *Fūdo* (風土) literally means “wind” (*fū* 風) and “earth” (*do* 土) and refers generally to the environment (*kankyō* 環境) of a given geographical area. By equating climate with the environment instead of nature (*shizen* 自然), Watsuji meant to indicate the cultural as much as natural phenomena of any place. He saw climate as dependently arisen in two ways. First and more broadly, climate arises from the interaction between nature and culture. Watsuji distinguished between the monsoon climate of India and Asia, the desert climate of Arabia, Africa, and Mongolia, and the meadow climate of Europe to consider how each type of climate resulted historically from the interaction of natural and cultural phenomena in a particular region: “Climate, essentially, is historical; so climatic patterns are at the same time historical patterns” [17].

Second and closer to hand, climate arises between human beings. *Ningen* (人間), the word for “human being,” combines the *kanji* for “person” (*nin* 人) with the *kanji* for “between” or “interval” (*gen* 間). 間 is a word with multiple pronunciations and can refer variously to an interval of space (*kūkan* 空間), to an interval of time (*jikan* 時間), or to a structural interval between units of a building (*ken* 間) or between humans (*ningen*)—employing the phonetic variant of *gen* in this compound word. What makes us human is literally *between persons*. This between-ness of persons is spatial as well as temporal, a phenomenon both of space and of time. In Watsuji’s formulation, “human existence” (*ningen sonzai* 人間存在) results from the space between people: “you” and “I” arise in relation to each other in the collective “we” of a society that is made from the “mutual relationship of existence” [17]. Our humanity is spatial.

The interdependence of human beings justifies Watsuji’s choice of *fūdo* instead of *shizen* to characterize the environment in which people live. At once subjective and social and objective and natural, our environment depends on the linked causality of mutual relationships in the dependent arising of individual and society, nature and culture, time and space: “[I]f the dual character of human existence is taken as the essential nature of man, then it is immediately clear that space must be regarded as linked with time” [17]. Human beings arise in social and spatial relationships to each other in relationship to a climate that develops historically over time in relationship to the world.

Because “mankind is saddled not simply with a general past but with a specific climatic past,” every place has its own climate [17]. India, China, and Japan belong to the same monsoon climate yet are set apart by their specific climatic histories. Watsuji located Japan’s historical climate in the house: “[T]he Japanese understand the house as ‘inside’ [*uchi* 内] and the world beyond as ‘outside’ [*soto* 外]. Within this ‘inside,’ all distinction between individuals disappears. To the wife, the husband is ‘inside’ [*uchi* 内] or ... even ‘the

house' [*otaku* お宅] ... To the husband, the wife is 'inside the house' [*kanai* 家内]. The family, too, is 'those within' [*uchi uchi* or *nai nai* 内々]—clearly distinguished from anyone outside; but once within, all distinction disappears" [17]. *Uchi* is realized in the spatially continuous interiors of traditional Japanese houses, inflected by movable screens and set apart from the outside world by façades, fences, and walls.

More than a formal device, the dichotomy of inside and outside has deep historical roots and permeates every aspect of Japanese social identity. Matthew Stavros notes in *Kyoto: An Urban History* that, from its founding in 794, the imperial capital was commonly identified, not by its formal name of Heiankyō, but by variants on a phrase meaning the "capital within": *kyōchū* (京中), *kyō no chi* (京の地), and *kyō no uchi* (京の内) [18]. It was sacred space "inside." After 1868, the government of Meiji Japan reaffirmed this sense of space with its policy of *kokutai* (国体). *Kokutai* literally means the "nation's body" and, as Watsuji recognized, this extended the interior space of the house to the city and the entire nation, establishing the state as a "national household" (*kokkataisei* 国家体制) that sheltered its people and was protected by its borders [17].

4. The Physics of Spacetime Relativity

Amended by Nishida and Watsuji, Heidegger's phenomenology located one coordinate in the project to formulate a Japanese philosophy grounded in Buddhism. As Satō Yasukuni (佐藤康邦) argues in "The Criticism of Science and its Assimilation in Modern Japanese Thought," Albert Einstein's physics located another [19]. Like Heidegger's *Being and Time*, Einstein's Special Theory of Relativity (1905) and his General Theory of Relativity (1915) challenged the rational dichotomy of space and time that the West had used since antiquity to schematize the physical world. Tanabe's early training as a mathematician equipped him to grasp Einstein's physics and he recommended what he found to Nishida. In turn, Nishida pushed for Einstein's invitation to visit Japan in November–December 1922. The philosopher asked the scientist to lecture on "How I Created the Theory of Relativity" when he spoke at Kyōto Imperial University on December 10 [13].

From Democritus in ancient Greece to Isaac Newton in the Age of Enlightenment, the physical world was divided in the West between the indestructible particles of solid matter that Democritus identified as atoms and the void of space through which matter moved. Newton's three laws of motion and his law of universal gravitation are premised on fixed differences of space and time: the absolute and unchanging vacuum of space defined in three dimensions by Euclidean geometry, and the equally absolute but changing line of time that moves uniformly in one direction from past to present to future. The material particles forming the universe are acted on in abso-

lute space and absolute time by the force of gravity according to the laws of motion. In *Physics and Philosophy* (1958), Werner Heisenberg described Newton's mechanical conception of the universe as a "closed system" that was expressed in axioms "written in a set of mathematical equations ... considered as describing an eternal structure of nature, depending neither on a particular space nor on a particular time" [20]. Kant accepted these constants of space and time as *a priori* conditions to our human experience of the world.

Einstein's Special Theory of Relativity redefined matter as a form of energy with the famous equation $E=mc^2$, in which "E" is energy, "m" is mass, and "c" is the speed of light. The discovery that particles can be split and turned into energy jettisoned the belief that matter is indestructible and produced the atom bomb. Subject to the constant speed of light, relativity brought together the previously distinct conditions of space and time. The spatialized rather than solid atom now existed in a universe where space and time had lost their autonomy to the 4-dimensional exchange of spacetime.

Because space quantified as distance is relative to time quantified as speed, the observation of any event in spacetime depends on its *particular* space and time. Einstein spelled out what this means in his 1916 essay on "Relativity—The Special and General Theory": "[U]nless we are told the reference body to which the statement of time refers, there is no meaning in a statement of the time of an event ... Before the advent of the theory of relativity it had always tacitly been assumed in physics that the statement of time had an absolute significance, i.e., that it is independent of the state of motion of the body of reference" [21]. In other words, any coordinate system used to determine location is specific to its own position both in space and in time. It has long been understood that how we see something depends on our position in space relative to that thing: what we see from the back is not what we see from the front. But spacetime affects how we see phenomena in time as well as space: two observers moving through space at different speeds will see the same event differently in time.

One of Einstein's thought experiments considers how a stone dropped from a speeding train falls straight down when seen from the train but in a parabola when seen from the embankment: "Do the 'positions' traversed by the stone lie 'in reality' on a straight line or on a parabola?... The stone traverses a straight line relative to a system of co-ordinates rigidly attached to the carriage, but relative to a system of co-ordinates rigidly attached to the ground (embankment) it describes a parabola. With the aid of this example it is clearly seen that there is no such thing as an independently existing trajectory ... but only a trajectory relative to a particular body of reference. In order to have a *complete* description of the motion, we must specify how the body alters its position *with time*, i.e. for every point on the trajectory it must be stated at what time the body is situated there" [21]. Instead of a singular, objectively fixed reality that exists independently of its observation, we are given two points of view in spacetime.

When any observation depends on the spacetime position of the observer, space and time cannot be objectively separated from their observation. Both become subjective phenomena of experience that describe how someone sees reality in a unique situation.

Dōgen made a similar point in “The Actualization of Enlightenment (Genjōkōan 現成公案): “If you are in a boat, and you only look at the riverbank, you will think that the riverbank is moving; but if you look at the boat, you will discover that the boat itself is actually moving.... Depending on the viewpoint we see things in different ways. Correct perception depends upon the amount of one’s study and practice” [9]. By “correct perception,” Dōgen did not mean that one viewpoint is right and the other wrong. Rather, he was telling us that neither viewpoint is any more nor any less true than the other since any point of view is a phenomenon arising in this moment. He was encouraging us to see through all viewpoints and all phenomena to the emptiness from which they come and to which they return.

As Einstein admitted in *The Evolution of Physics* (1938), even physics “is a creation of the human mind, with its freely invented ideas and concepts. Physical theories try to form a picture of reality and to establish its connection with the wide world of sense impression” [22]. This echoes Kant’s distinction between the objective “thing-in-itself” and our subjective representations of that thing, except for a telling qualification. What Descartes and Newton and Kant each assumed to be objectively absolute and preexistent facts, created by the mind of God and correctly described in mathematical laws, were recognized by Einstein to be human constructs that we use to explain reality to ourselves.

The General Theory of Relativity applied the Special Theory to the force of gravity, which Einstein described as a gravitational field rather than Newton’s attraction of solid bodies. He asked why a stone falls to the ground: “The action of earth on the stone takes place indirectly. The earth produces in its surrounding a gravitational field, which acts on the stone and produces its motion of fall” [21]. Gravity is a consequence of objects falling into the places created by the curvatures of spacetime. When the three dimensions of absolute space and the one dimension of absolute time are replaced by the relative dimensions of spacetime, the straight lines of Euclidian geometry that had previously described the physical universe give way to the hyperbolic curves of differential geometry. Measurements of distance in space and intervals in time are alike affected by curved spacetime. This curvature explains, for example, why the relative positions of moving objects—each traveling incrementally faster to cross a greater distance in the same amount of time that slower objects take to cover a shorter distance—plot a curved rather than straight line through space.

The parallels between Buddhist emptiness and the physics of spacetime caught the eye of the Kyōto School. In both systems of thought, our knowledge of reality depends on the relativity of phenomena instead of some innate, *a priori* abil-

ity to determine through reason an inherent order of preexisting ideal objects. Instead of Kant’s “Ding an sich,” we have the emptiness from which Dōgen said all phenomena arise in the eternal present of this moment—or, as Heidegger put it, phenomena that can only show themselves in themselves because there is nothing behind them.

Nishida used the Buddhist metaphor of a mirror to issue a warning in “Basho” about the limits to any claim to objective knowledge: “To mirror means to let things stand, to receive it, as it is without distorting its form ... Because a mirror is a kind of being, it cannot truly mirror the thing-in-itself. Instead it mirrors things by distorting them ... In proportion to the degree to which what houses the image of other things is a being, the [mirror image] is not the figure (*shōzō* 肖像) of another but merely a representation (*shōchō* 象徵) or a sign (*fugō* 符号)” [12]. The mirror at once reflects the world in a precise, nondiscriminatory image and distorts that image because the mirror remains itself and can only *represent* the world. Despite the powerful illusion of reality, the image in the mirror is empty, a phenomenon or sign behind which there is nothing. Like Dōgen’s “moon reflected on water,” the mirror reflects the ephemeral and transient “ten thousand things” that arise continuously in time to make up the universe. The emptiness of phenomena and spacetime relativity alike lead to the same conclusion: Kant’s “thing-in-itself” is merely the illusion of a preexisting reality that we project onto a reality that comes from nothing.

Nishida was careful not to confuse his philosophical attention to the metaphysics of consciousness with Einstein’s scientific investigation of the physics of matter: “What I mean here by *basho* wherein forces are implaced is not like the so-called force field that physicists speak of ... When we conceive space, time, and force as all means of thinking, the objective *basho*, wherein given experience is itself immediately emplaced, must be a transcendent field of consciousness” [12]. Yet the caveat merely reminds us how the physics of relativity align with Buddhist causality. Consciousness and gravity alike cease to be autonomous things when they exist “perilologically” in relation to a field or *basho*, the place from which they arise as phenomenal conditions. Phenomena of space and time, matter and energy, exist in one moment only to vanish in the next. The stable binaries that shaped Western science from Democritus to Newton—solid matter versus the void of space, three-dimensional space versus linear time—give way to a dynamic understanding of the universe as a field of spacetime possibilities.

The universe cannot preexist its existence now. Einstein emphasized this point when he wrote in March 1955 to the family of his friend Michele Besso who had died: “People like us, who believe in physics, know that the distinction between past, present, and future is only a stubbornly persistent illusion.” [23]. Einstein was referring to what physicists call the “block universe,” where past, present, and future co-exist, where “now” merely describes an arbitrary location in time, and where the belief that time advances in one direc-

tion is false. This sounds like Dōgen's insight in "Being-Time" that "we exist in the eternal present of time," and Nishida's proposition of an "eternal now" that contains its own past and future. The awareness that any linear construction of time is a fiction speaks to the collective realization of the scientist, monk, and philosopher that our sense of time's passage—from past, to present, to future—reflects how we perceive *phenomena* of time rather than *time* itself, which is timeless. In any moment, our sense perceptions coalesce into the experience of a present that is lodged between a remembered past and an expected future. This psychological impulse creates the illusion that time is moving forward in one direction, when in fact each moment remains discrete and directionless in time. Time does not flow continuously from past to future, but instead simply and constantly *is*, just as there is no universal "now" shared by everyone, only an infinity of "nows" that are each relative to a specific place in space and time. Your "eternal now" is not necessarily my "eternal now."

Quantum Mechanics took the spacetime paradoxes of relativity farther than Einstein intended by admitting uncertainty into what he maintained was still an orderly universe. In 1900, Max Planck had quantified the energy emitted or absorbed by matter into packets called quanta. In 1905, Einstein theorized the existence of photons, quanta of light that exchange mass for energy and travel at the speed of light in a vacuum. Between 1911 and 1913, Ernest Rutherford and Niels Bohr formulated the modern theory of the atom as a spatial structure that is composed of orbiting subatomic particles held together by electrostatic forces. In 1926, the realization that photons move in electromagnetic waves and therefore exist both as particles and as waves led Werner Heisenberg to posit the Uncertainty Principle.

This principle says that an observer can either know the position of a particle—where it is *located* on a wave—or the momentum of that particle—where it is *headed* in that wave—but not both, at any one time in any one experiment. The answer you get in an experiment depends on the question you ask. Instead of objective certainties, Quantum Mechanics deals with statistical probabilities. Heisenberg said that these probabilities "represent a mixture of two things, partly a fact and partly our knowledge of a fact" and are "a mathematical expression that combines statements about possibilities or tendencies with statements about our knowledge of facts" [20]. The binary insistence of classical logic that a statement must either be true or be false, ceases to hold in Quantum Mechanics.

In the *Tao of Physics*, Fritjof Capra placed the Uncertainty Principle at the crossroads of Eastern insight and Western knowledge: "We can never say that an atomic particle exists at a certain place, nor can we say that it does not exist. Being a probability pattern, the particle has tendencies to exist in various places ... The particle is not present at a definite place, nor is it absent. It does not change its position nor does it remain at rest" [24]. Positing the "co-existent potentialities" of any physical phenomenon, Quantum Mechanics agrees

with the self-negating propositions of Buddhist logic: being; nonbeing; both being and nonbeing; neither being nor nonbeing [20]. The third-century Indian Buddhist philosopher Nāgārjuna put it succinctly in *The Fundamental Wisdom of the Middle Way*: "Everything is real and is not real, Both real and not real, Neither real nor not real" [25]. The absolute goes from Kant's absolute thing-in-itself to the incessant arising of things from absolute emptiness.

5. Conclusion

In 1933–1934, the writer Tanizaki Jun'ichirō (谷崎潤一郎) set the muted, penumbral interior of the Japanese house against the garish white tile and electric lighting of Western houses in his meditation on Japan-ness, "In Praise of Shadows" (In'ei raisan 陰翳礼讃). As vital to Tanizaki's thinking as it was to Watsuji, the house stood for traditional culture at a time when Japan was suffering the onslaught of modernization. Wondering why "the conveniences of modern civilization ... could not be designed with a bit more consideration for our own habits," Tanizaki preferred the pungent yet clean Japanese privy (*benjo* 便所) over the sanitary, yet lifeless, porcelain flush toilet brought from the West. He called the *benjo* a "place of spiritual repose" that "stands apart from the main building, at the end of a corridor, in a grove fragrant with leaves and moss" [26]. We are in a place where time and space co-exist in the moment.

Tanizaki extended the comparison to science, asking "how different everything would be if we in the Orient had developed our own science. Suppose for instance that we had developed our own physics and chemistry: would not the techniques and industries based on them have taken a different form, would not our myriad of everyday gadgets, our medicines, the products of our industrial art—would they not have suited our national temper better than they do? In fact our conception of physics itself, and even the principles of chemistry, would probably differ from that of Westerners ..." [26]. He went on in the same vein to muse how different the fountain pen might be had it been invented by the Chinese or Japanese after the model of a traditional writing brush (*fude* 筆). Tanizaki did not intend to be taken literally, any more than he wanted to live in the past. Rather, he was taking rhetorical aim at the presumption that Western knowledge had ever been intrinsically superior to Eastern insight.

He was not alone. Watsuji Tetsurō groused in *Climate* that the cars and trams introduced by modern technology were out-of-scale with the streets of Japanese cities, where they "overwhelm and overbear man" [17]. Suzuki Daisetsu fretted in *Zen and Japanese Culture* (1938/1959) that modern science was causing the Japanese to forget their Buddhism: "The little 'science' we are so proud of makes us conscious of all kinds of uncertainties surrounding us and urges us to dispel them by means of observation, measurement, experiment, abstraction, systematization, etc. But there is one great Uncertainty, born of Ignorance and productive of all other

uncertainties, which defies all of our ‘scientific calculations’...” [27]. The writer, philosopher, and teacher were each lamenting their dislocation in a world that seemed every day more alien.

The discontent voiced by Tanizaki, Watsuji, and Suzuki can sound like luddite protests against a changing world. They are better understood, however, as memes for an astonishing truth: whether in the form of Albert Einstein’s physics or Martin Heidegger’s philosophy, the most modern Western scientific knowledge had been anticipated by millennia of Eastern spiritual insight. In *Philosophy as Metanoetics* (*Zangedō toshite no tetsugaku* (懺悔道としての哲学, 1946), Tanabe Hajime noted that modern physics had discarded the distinction between scientific knowledge of a limited world of phenomena and metaphysical knowledge of the absolute: “One of the remarkable things about the new physics of our day is that ideals whose function is to bring a theoretical system to completion enter into the content of physical experience as a mediator of experiments, so that the notion of the infinite comes to form a constitutive element of physical theory. It appears in the theory of relativity and in the new quantum theory...” [28]. Echoing Watsuji, Tanabe went on to observe that the phenomena of nature as much as culture have a history when they arise in spacetime: “What the new natural science makes clear to us is that nature is also in fact historical.” [28].

Philosophy as Metanoetics was based on Tanabe’s final lectures at Kyōto Imperial University in November and December 1944, before he retired in early 1945. But it was finished after the bombings of Hiroshima and Nagasaki had brought home the power of modern physics with brutal indifference to its victims. While the philosopher excoriated the Japanese for the wartime nationalism that brought disaster to their country, his response to the bombings was surprisingly impartial: “The awesome force of the atomic bomb does not lie in matter but in an absolute reality mediated by human subjects” [28]. The history of any people or place or culture, Tanabe was saying, is written across the emptiness of time in space from which it arises.

Metanoia is the Greek term for repentance and literally means “changing the mind.” Translated as *zange* (懺悔)—from the *kanji* for “penitence” or “confession” (*zan* 懺) and “repent” (*ge* 悔)—it described for Tanabe a practice of self-negation that accepts the limits of human reason and the need for repentance in the face of our common capacity for evil. Necessarily, we are all in this together and are each relative to everything else: we cannot exist apart from anything or anyone or any event or any place in the world. Because everything is brought into existence and defined by its relationship to everything else, nothing can preexist its actual existence in this moment, nor can it have intrinsic characteristics. Stripped of inevitability, history as the story of human experience loses its customary sense of going *somewhere* and is revealed instead to be an endlessly discrete accumulation of moments that can go *anywhere* because every moment in time is absolutely transient and impermanent. The atomic bombing of Hiroshima

was such a moment, where a city’s time and space disappeared in a single tragic instant, only to begin again.

Author Contributions

Christopher Curtis Mead is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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Biography

Christopher Curtis Mead is an Emeritus Regents' Professor of Architecture and Art History at the University of New Mexico. He received his B.A. summa cum laude from the University of California at Riverside, and both his M.A. and Ph.D. from the University of Pennsylvania. A Fellow and past President of the Society of Architectural Historians, he has written widely on modern architecture and urbanism, including books on the architects Charles Garnier, Victor Baltard, Robert Venturi, Bart Prince, and Antoine Predock. His most recent book studies the history of modern Japanese architecture, culture, and thought after the bombing of Hiroshima.

Research Fields

Christopher Curtis Mead: Architecture, Urbanism, History, History of Architecture, History of Urbanism, History of Culture