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Emily Thomas

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ARTICLE

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Mary Calkins, Victoria Welby, and the spatialization of time

Emily Thomas

Department of Philosophy, Durham University, Durham, UK

ABSTRACT

This paper explores a trans-Atlantic clash about time: in 1899, American philosopher Mary Calkins argued we should not spatialize time; in 1899, British philosopher Victoria Welby argued we should. I take their disagreement as a starting point to contextualize, study, and compare the accounts of time presented in their respective articles. Both Calkins and Welby cared deeply about time, writing on the topic across their careers, but their views have not been studied by historians of philosophy. This is unfortunate, for I argue their novel theories reward attention. Calkins' 1899 account draws on Kant to arrive at the earliest American-British causal theory of time, pioneers the metaphysical applications of temporal experimental psychology, and replies to F. H. Bradley's proclamation that it is 'impossible' to explain the appearance of time. Meanwhile, I read Welby's 1907 account as offering a radical metaphysic, on which time is literally a kind of space, resonating with 1880s literature around the 'fourth dimension' and H. G. Wells' 1895 novel *The Time Machine*. I have uncovered an early draft of Welby's paper dating to 1902 and, using this alongside other unstudied writings by Welby, trace the development of her views from the 1880s onwards.

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Professor Calkins complains of the traditional definition of time, on the ground that it confuses what lasts with what succeeds. And she would identify Time not with duration but with succession.

> "To the question, What is time? the traditional answer is from the outset unsatisfactory, for it enumerates two distinct attributes of time, duration, and succession, without giving an inkling of their relation to each other … Now if we are to choose between succession and duration as expressions of the real nature of time, there cannot well be any doubt of the decision.

CONTACT Emily Thomas emily.e.thomas@durham.ac.uk

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> Things endure, qualities persist, one experience outlasts several others, but the essence of time is its restlessness, and the nature of time is the multiplicity, the succession, of its moments." [Calkins, "Time", 218]

> But this is really doing violence to our perfectly true instinct of requiring Time as Space in which we may journey through life – moving ever forward. And we might as well endow 'motion' itself with a 'restless nature', words which indeed only apply in the organic sphere.
>
> (Welby, "Time as Derivative", 387)

1. Introduction

This paper explores the above trans-Atlantic clash. American philosopher Mary Calkins' 1899 "Time as Related to Causality and to Space" argues we *should not* spatialize time, whilst British philosopher Victoria Welby's 1907 "Time as Derivative" argues we *should*. I take their disagreement as a starting point to contextualize, study, and compare the accounts of time presented in their respective articles.

Both Calkins and Welby cared deeply about time, writing on the topic across their careers, but their views have not been studied by historians of philosophy.[1] This is unfortunate, for I argue their novel theories reward attention. Calkins' 1899 account draws on Kant to arrive at the earliest American-British causal theory of time, and pioneers the metaphysical applications of temporal experimental psychology. I suggest she published it as a reply to F. H. Bradley's proclamation that it is 'impossible' to explain the appearance of time. Meanwhile, I read Welby's 1907 account as offering a radical *metaphysic*, on which time is literally a kind of space, resonating with 1880s literature around the 'fourth dimension' and H. G. Wells' 1895 novel *The Time Machine*. I have uncovered an early draft of Welby's paper dating to 1902 and, using this alongside other unstudied writings by Welby, trace the development of her views from the 1880s onwards. This study should be of interest to scholars of Calkins and Welby, of the spatialization of time, and of late nineteenth- to early twentieth-century metaphysics more generally.

The paper proceeds as follows. Section 2 gives some history of the spatialization of time, and some terminology. Section 3 considers Calkins' 1899 account. Section 4 considers Welby's 1907 account. Section 5 examines their disagreement: Calkins holds temporal succession to be *temporal*, whereas Welby holds it to be *spatial*. Fundamentally, I argue the root of their clash is metaphysical: Welby's extreme spatialization of time comprises an anti-realism about time, whereas Calkins reasons from our experience of

[1]There are no studies of time in Calkins, and all the pertinent literature on Welby is written from a history of semiotics perspective.

time to its partial reality. For Welby, time exists only in our minds. For Calkins, time is a feature of the world.

2. On spatializing time

The spatialization of time has a long history, dating at least to Aristotle's view that space is 'conceptually prior' to time.[2] I distinguish two ways of spatializing time. One is to *semi-spatialise* time: attribute the features of space to time. This process does not merely treat space and time in parallel: it reasons *from* space *to* time. Semi-spatializing time was especially popular with early moderns. For example, scholars have long recognized that Isaac Newton analogically extends the 'features' of absolute space to time,[3] conceiving them both as infinite, eternal, immutable pseudo-substances.

Another way is to *fully-spatialise* time: literally hold time to be a kind of space. Fully spatialized theories of time emerged in the late nineteenth century, fuelled by speculations around the 'fourth dimension'. We perceive three spatial dimensions – length, width, and depth – but mathematicians have long theorized more. From 1880 onwards, Charles Hinton's work brought such theories to prominence. Hinton likely inspired Edwin Abbott's 1884 novel *Flatland*, which describes creatures who can only perceive limited numbers of spatial dimensions: Linelanders perceive one, Flatlanders perceive two, and so on. Gradually, 1880s thinkers came to conceive the fourth dimension as time.[4] Wells famously popularized this notion:

> There are really four dimensions, three which we call the three planes of Space, and a fourth, Time …
>
> Scientific people … know very well that Time is only a kind of Space.
>
> (Wells, *The Time Machine*, 7; 10)

For Wells' (*The Time Machine*, 5) characters, this enables time travel: "admit that time is a spatial dimension … it becomes possible to travel about in time".

Semi and fully spatialized accounts of time are often associated with 'block universe' theories. Dainton (*Time and Space*, 7) describes such ontologies as follows: "all moments of time (and all events) are equally real … differences between past, present and future are simply differences of perspective". Block universe theories ascribe two features to time. First, all times (and events) comprise an *existing whole*. Second, as nothing is really past, present, or future, no time (or event) is *privileged* as present. I note that,

[2]Gorham ("Twin-Brother", 23–4) offers a rare study of this history.
[3]See Gorham ("Twin-Brother", 37–8).
[4]On this history, and connections between Hinton, Abbott, and Wells, see Bork ("Fourth Dimension"), Nahin (*Time Machines*, 89–97), and Throesch (*Before Einstein*, 26–32; 48–53; 133–7).

perhaps because of time travel stories, block universe theories often ascribe a third feature to time: it is *multi-directional*. By this, I mean that time permits motion in multiple directions: the time series may, say, run past to future, or future to past.

3. Calkins on time: a fleeting, flying succession

Mary Calkins (1863–1930) spent most of her career at Wellesley College, Massachusetts, where she taught philosophy and established an early American laboratory for experimental psychology. She attended Harvard's graduate school in 1890–1, studying with psychologist William James and Absolute idealist Josiah Royce. In 1905 she became the first woman elected president of the American Psychological Association; and, in 1918, of the American Philosophical Association.[5] Calkins' writings on time span her career, including an 1890 paper on time in Kant, an 1897 paper on time in Kant and Leibniz; a study of time and volition in her 1901 *Introduction to Psychology*; and discussions throughout her 1907 *Persistent Problems of Philosophy,* revised continually until 1925.

"Time as Related to Causality and to Space" comprises four sections.[6] The introduction, §I (pages 216–7), summarizes the paper's aims:

> Two fundamental errors, one positive and one negative, still contribute to a radical misunderstanding of the nature of time. Metaphysicians insist, as they have insisted for centuries, on treating Time and Space as analogous, and on attributing to the one the characteristics of the other; and … they overlook the fundamental and far-reaching likeness between Time and Causality.
>
> This paper aims to suggest the proper relations of time to causality and to space, and their common reference to a more ultimate category.
>
> (Calkins, "Time", 216)

§II, titled "Time", (pages 218–227) addresses the first error; §III, "Causality" (pages 227–299) addresses the second error; and §IV (pages 229–232) places Calkins' conclusions within an idealist context. §II was evidently of especial interest to Calkins, for it is longer than all the other sections combined.

§II sets out an account of time, and then argues for it. The description of time starts with the passage quoted by Welby above: Calkins asks 'What is time?', and objects to the 'traditional answer', which attributes 'duration' and 'succession' to time.[7] Calkins understands 'duration' as the way things "endure … persist … outlast". On the 'restless' 'succession' of moments in time, she continues:

[5]Biographies of Calkins include Zedler ("Calkins", 103–4) and Rogers (*Women Philosophers*, 207–9).
[6]Calkins' original paper mis-numbers these sections I, II, IV, and V; I re-number them I, II, III, and IV.
[7]Calkins does not give a reference for this answer; perhaps she is thinking of John Locke's (*Essay*, 84; II.xiv.9) thesis that our idea of time derives from our experience of duration and succession.

> the succession, not the duration, is truly temporal. Everyday reflexion has always, indeed, identified time with succession … the "flight of time," the elusiveness of the moment, the stream of time, are all expressions of our ordinary consciousness.
>
> (Calkins, "Time", 218–9)

A 'succession' refers to things following one another. Calkins claims that the succession of time is distinct from other kinds of succession, such as a spatial succession of houses. One way Calkins ("Time", 220) holds temporal succession to be distinct is its 'characteristic irrevocableness': "The moment never returns, the past is gone beyond recall, the present is always a new phenomenon". In contrast, a succession of houses could recur. Another way concerns duration. A spatial succession has duration or permanence: a succession of houses coexist. In contrast, a temporal succession lacks duration or permanence: events fly or stream past, moments of time are 'elusive' because they cannot be caught, the moments do not coexist.

Calkins explains that you would mistakenly choose duration, not succession, to be the real nature of time if you committed the first error described above:

> The tendency to foist permanence upon the restless nature of time is clearly the result of the misleading habit of making time analogous with space. We of modern times owe much of this misunderstanding to Newton's *Principia* … [wherein] time absolute … is but the pale abstraction from absolute space … In the same way, the sections on Time in the *Kritik* [Kant's *Critique*] owe their obvious weakness to … treat[ing] spatial and temporal reality after the same fashion.
>
> (Calkins, "Time", 220)

We 'foist' duration or permanence onto time because of the early modern practice of semi-spatializing time.[8] To summarize, Calkins is saying that the succession of time is distinctively *temporal*, not spatial: the nature of time is succession, conceived as an irrevocable, fleeting stream.

Calkins ("Time", 221) goes on to claim that the successive moments of time are universally connected. Time is more than "bare multiplicity", a varied "manifold", for "its moments are … united". I take this to mean that every moment of time is before, after, or simultaneous with every other moment. She puts the temporal succession of time together with its connectedness:

> The temporal series is not only connected but irreversibly connected, that is, past, present and future must be experienced in the same fixed order. One may turn one's eyes from east to west or from west to east … while one cannot live the future before the present … The past is the 'irrevocable' member of a series, on which another member, the present, 'depends' – with which, that is to say, it is irreversibly connected. The present is therefore

[8]Calkins was extremely familiar with this history; for example, Calkins ("Kant's Conception", 361) comments on space-time analogies in Leibniz and Kant.

> dependent on the past, and the future on the present, in a sense in which the past is not dependent on the present.
>
> (Calkins, "Time", 221)

All moments of time are connected, but the irreversibility of time (its irrevocable succession) stems from the dependence of each moment on its preceding one. I will say more on this below.

Having described her metaphysic of time, Calkins argues for it, using the experimental psychology of time perception or consciousness. Her discussion is lengthy, so I give just the key points:

> This doctrine of the nature of time, like every philosophical theory, must meet the test of correspondence with admitted facts of consciousness. Now the essential of one's consciousness of time … [is] of a successive multiplicity. When this realisation of multiplicity is absent, when one is absorbed in a topic of thought … then one is lost to the sense of time; but when one wakes up to the fact of change … then the consciousness of time reappears.
>
> (Calkins, "Time", 223)

Our consciousness of time comprises consciousness of change – which, for Calkins, implies temporal succession. She claims this is especially true when "uninteresting and habitual contents of consciousness", such as breathings and muscular contractions, "form the measure of time-intervals": our attention is then directed to the "fact of succession". In support of these claims, Calkins ("Time", 223) cites several sources. One is Harald Høffding (*Outlines of Psychology,* 184), who states that time comes to us as "change, transition, alteration". Another is James (*Principles of Psychology*, i.620), who claims that we continually feel a 'changing process': "Awareness of change is thus the condition on which our perception of time's flow depends".

Further, Calkins ("Time", 223) claims that psychology recognizes that we experience time as connected; she cites Høffding's 'admirable exposition'. Høffding (*Outlines of Psychology*, 184–5) writes that we are conscious of "inner connection throughout all change". If we merely experienced two succeeding conscious states *a* and *b*, and drew no connection between them, such that *a* is forgotten when *b* appears, "no idea of time can arise". We experience *a* and *b* as being in time when something yokes them together. James (*Principles of Psychology*, 605–6) agrees, considering the possibility that our consciousness is akin to a string of separate bead-like sensations, and argues this would "be like a glow-worm spark, illuminating the point it immediately covered, but leaving all beyond in total darkness". Clearly, James argues, our consciousness experience is not like this: "Our feelings are not thus contracted … The knowledge of some other part of the stream, past or future … is always mixed in with the knowledge of the present thing". In turn, James (*Principles of Psychology*, 607–8) cites the psychologists Shadworth Hodgson, Johann Friedrich Herbart, and Wilhelm Wundt.

Psychology seems to show that our time-consciousness involves 'change' or 'succession'; and 'inner connexion'. Calkins ("Time", 225) characterizes these experiences as "elements" because they are "unanalysable" into further experiences; and as "direct" because they have "immediacy". This allows her to conclude:

> Psychology does therefore substantiate our philosophical doctrine by indicating change and inner connexion as elements of the facts of time-consciousness …
>
> These … correspond exactly with the elements of time, metaphysically considered – with its irrevocable manifoldness and with the universal connexion of its parts, the moments.
>
> (Calkins, "Time", 225–7)

Calkins wields the new psychology of time perception to support her metaphysics. I argue this strategy was highly original. Experimental psychology only emerged in the mid-nineteenth century, yet Calkins (*An Introduction to Psychology*, 443–4) was quick to argue that "modern psychology is through and through experimental": "experiment is of untold value to every psychologist". Today, it is common to use psychology's empirical findings concerning time perception as evidence for metaphysical views.[9] But it was not common at the turn of the twentieth century. Philosophers such as James Ward ("Psychology") and James (*Principles of Psychology*, 605–42) discussed the experimental psychology of time perception, but they did not (at least not explicitly) use these discussions as the basis for a metaphysic. In so doing, Calkins became a temporal psychology to metaphysics pioneer. This may even have inspired Royce. It is usually said that Royce shaped Calkins' thought, rather than vice versa.[10] Yet, two years after Calkins' time paper, Royce (*World and the Individual*, 122) motivates his metaphysic of time using psychological work on the specious present; perhaps Royce borrowed this psychology-to-metaphysics strategy from his pupil.

There, however, is a further component of her view that does not admit of psychological support. Having claimed that the moments of time are universally connected, she continues:

> And this universality … follows from another characteristic, its necessity. By the necessity of connexion is meant that the synthesis of the manifold depends on somewhat more fundamental than itself, that is upon the fundamental unity of reality which makes it impossible that any unconnected manifold should exist.
>
> (Calkins, "Time", 221)

[9]For example, Emery et al ("Time", §5; §12) explain that philosophers use psychology's empirical findings to defend, and reject, the reality of temporal passage.
[10]McDonald ("Achieving Unity", 122).

Why does Calkins believe that the universal connection holding between moments of time is necessary? I find the answer in §III of her paper.

§III argues against the error of overlooking the "far-reaching likeness" between time and causality, referring to what is now known as Kant's 'causal theory of time'. Recognizing that time and causation both have order or direction, causal theories reduce the time order to the causal order.[11] Bardon (*Brief History*, 117) describes Leibniz's theory as follows. The 'earlier-later relation' is just our way of understanding 'causal direction', such that an event A is 'earlier than' some other event B, in that A is one of (or coexists with) the causes of B. Kant accepts Leibniz's causal theory but adds a transcendental twist. Kant (*Critique,* B237) asks us to consider two series of perceptions. We can perceive the parts of a house in any order, starting from its windows or its roof. In contrast, we can only perceive a drifting ship as moving downstream. Kant writes it is "impossible" that the ship should "first be perceived downstream and afterwards upstream". Although our perceptions of the ship are necessarily connected in a particular order, Kant (*Critique,* B234) argues there is nothing in the perceptions themselves that provide this order. Instead, our minds impose this order, via the "concept of the relation of cause and effect, the former of which determines the latter in time".

Calkins thinks Kant is onto something:

> The permanently valuable part of his theory of time is to be found … where time is treated as a category by being virtually identified with causality. For by the words, "it is a formal condition of sense perception (*Wahrnehmung*) that the earlier time necessarily determine the later," Kant [(*Critique,* B244)] indicates that necessary connexion, which is the essential of causality, is also the fundamental characteristic of time.
>
> (Calkins, "Time", 222)

Causal and temporal orders both exhibit the characteristic of necessary connection. As Calkins ("Time", 229) puts it later, "causality is fundamentally … the necessary … and irreversible connexion of every event with some other event, its cause". This helps us understand the dependence between moments of time: the same necessary connection holds between the present moment and its predecessor as between an effect and its cause. In advocating this part of Kant's view, Calkins is (as far as I am aware) advancing the first American-British causal theory of time.

The difference between Kant and Calkins lies in how they explain the virtual identification of time with causation. As I read Calkins, she agrees with Kant that there is nothing in our perceptions to explain their order,

[11] Van Fraassen (*Introduction*, 35–57; 170–82) offers a general history of causal theories of time, covering Leibniz, Kant, and twentieth-century thinkers; Bardon (*Brief History*, 116–9) focuses on Leibniz and twenty-first-century theories.

but disagrees over the source of this order. As an Absolute idealist, she implicitly sources this order in the Absolute. Calkins does so by arguing that causation and time are both subordinate forms of the same underlying category: necessary connexion. Calkins ("Time", 217) describes this category as "the unity of the many with each other": "the relation, direct or indirect, of every bit of reality with every other". She characterizes it as being akin to Schopenhauer's most fundamental category *Grund*, "a principle of unity manifested in many ways". Calkins ("Time", 222) uses this deeper category to explain the 'oneness' of time: it has the "unity of the manifold, the related oneness of phenomena necessarily bound together". The moments of time, and the events of causation, exhibit irrevocable succession and universal connection because they are manifestations of this deeper category:

> Time … is clearly a form of the category of necessary connexion, and is closely related to causality … the temporal manifold is made up of moments, whereas the causal manifold is that of events, but the underlying unity is the same in both cases, that of the irreversible connexion of the irrevocable.
>
> (Calkins, "Time", 222)

Time is not a form of space, it is a form of 'necessary connection' involving 'irreversible connexion'. And this explains why its moments are necessarily connected. This leads us to the Absolute. §I hints at Calkins' Royce-esque Absolute idealism. Calkins ("Time", 216) claims that the "ultimate unity" of the world is essential to any "monistic hypothesis", such as that of the "idealist", "to whom the universe is fundamentally the vital unity of individual selves within an absolute self". §IV advances similar hints, via Calkins' ("Time", 232) chart describing monist and pluralist systems. At the top, the monist 'idealistic' system characterizes the 'Ultimate Unity' as 'The Absolute Self'. Calkins notes that this top section alludes to principles "which have not been discussed", but was added for "completeness". She clearly conceives the Absolute as the source of the world's unity, the ultimate source of time.

What moved Calkins to write "Time as Related to Causality and to Space"? Calkins' unpublished papers includes an essay 'probably' written in 1890, "The Space and Time Doctrine of Kant".The essay endorses a 'restatement' of Kant's doctrine, which it summarizes as follows:

> this re-statement … rests upon the undeniable distinction between the spatial and the temporal … points out that there are other factors of experience … and that the temporal belongs along them; and finally discovers the nature of time to be necessary succession, so that the temporal is allied with the causal.[12]

Assuming the essay's 1890 date is correct, Calkins had held her 1899 account of time for at least nine years. I speculate that she was driven to argue for it in print by way of replying to Bradley's 1893 *Appearance and Reality*.

[12]Box 11, Folder 5. Mary Whiton Calkins Papers, Wellesley College Archives, Massachusetts.

The "Appearance" part of this book consigns time to appearance; the "Reality" part asks what we can know of ultimate reality, the Absolute. Bradley (*Appearance and Reality*, 205–20) states it is "impossible" to "explain time and space, in the sense of showing how such appearances come to be". Yet he offers two considerations to "weaken our belief in time's solidity". One is our assumption that the time series has *unity*, that all phenomena are temporally related in virtue of standing 'after', 'before', or 'together'. Bradley argues this assumption is baseless: there could be many time series bearing no temporal relations with each other. Their only 'way of union' would lie within the 'all-inclusive' Absolute. Another is our assumption that the time series has a single *direction*, from past to future. This assumption is also baseless, for "the direction, and the distinction between past and future, entirely depends upon *our* experience". In an earlier paper, Bradley ("Remember Forwards", 581) claimed humans construct the direction of time out of "practical necessity". Building on this, Bradley (*Appearance and Reality*, 216) uses Figure 1 to show that lives could run in other directions to our own:

Any line, running up or down or transversely, could be a time series and a life, yet all exist in a 'stationary' whole – the Absolute.

Bradley loomed large within Anglo-American idealism, and Calkins ("Time", 216) cites *Appearance and Reality*. Calkins ("Credo", 212) lists Bradley, alongside 'my great teacher' Royce, amongst absolutists who influenced her most. Given this, she was almost certainly familiar with his views on time. Bradley argues that time could be disunified or multi-directional. In contrast, Calkins conceives time as necessarily connected and as irrevocable – as uni-directional. I do not believe it is a coincidence that Calkins defends precisely the features of time that Bradley undermines. Instead, I read her as tacitly challenging these Bradleyian theses. To readers of the period, I suspect this would have been obvious. More generally, "Time as Related to Causality and to Space" can be understood as sketching a reply to Bradley's 'impossible' task of explaining how the appearance of

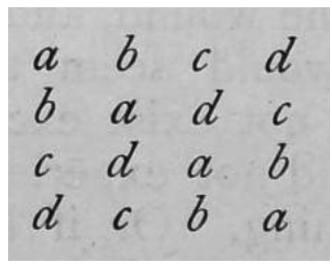

Figure 1. "A variety of time-series". Bradley (*Appearance and Reality*, 216). Reproduced with permission of the private owner.

time came to be: time is a unity stemming from that great unity, the Absolute.

4. Welby on time: a kind of space

Victoria Welby (1837–1912) spent most of her adult life in Grantham, England, where she worked independently on theology, philosophy, and language. She created a formidable intellectual network, corresponding with over 450 thinkers. In 1908, she became a member of the Aristotelian Society.[13] There is a tendency in the scholarship to elide her work on time. For example, Myers ("Welby", 19) describes her research on time as "brief", a mere "excursion" within her thought. This is inaccurate. Like Calkins, Welby wrote on time across her career: including an 1881 essay "The Now"; correspondence from the 1880s onwards; her 1907 "Time as Derivative"; and 1909 "Mr. McTaggart on the "Unreality of Time"".

I distinguish (and label) five sections within "Time as Derivative". Its opening lines state:

> THE idea of Time is always found bracketed with that of Space … With rare exceptions the two seem to be treated by thinkers of all schools as equally original and originative categories …
>
> I venture to suggest that whereas Space is the primary and inevitable 'Room' for change … Time is the product of our experience of Motion and its condition, Space. It is in other words a translated application of these two really original ideas.
>
> (Welby, "Time as Derivative", 383)

Against 'bracketing' or parallelizing space and time, Welby will argue we should fully spatialize time: take time to be a kind of space. Following the paper's introduction §1 (page 383), §2 (pages 383–5) argues that our language, and ideas, of time derive from space. §3 (pages 385–93) discusses excerpts about time taken from recent literature. Welby argues some of these excerpts misconceive time, whilst others implicitly support her view. §4 (pages 393–9) considers the origin of our idea of time, and offers a new metaphysic. The conclusion, §5 (pages 399–400), summarizes some of her points.

Existing literature on "Time as Derivative" implies that it is primarily concerned with language. The paper has been described as an "application of signific maxims" to time, and as focused on "issues of interpretation" (see Eschbach, "Significs", xiii and Myers, "Welby", 17). There are two sustained studies of Welby on time: one in Petrilli's groundbreaking 2009 book on Welby (*Signifying and Understanding*, 388–403), which also prints many of

[13]Biographies of Welby include Eschbach ("Significs", ix–xv), Schmitz ("Victoria Lady Welby's Significs", xxii–xxviii), Myers ("Welby", 1–5), and Petrilli (*Signifying and Understanding*, 7–14).

Welby's unpublished or inaccessible works; and Luisi's 2013 paper ("Peirce and Welby").[14] Although these studies touch on Welby's metaphysics, they confirm the impression that Welby's primary interest is language. This is partly because both approach "Time as Derivative" through Welby's 1903–11 correspondence with American pragmatist C. S. Peirce, which primarily concerns language. Against this trend, I present "Time as Derivative" as primarily concerned with metaphysics – as advancing a theory of what time *is*. This reading pivots around §4 of her paper.

In §2, Welby ("Time as Derivative", 383–4) offers many examples to show our language of time derives from space: we can describe a 'vast', 'short space', or 'length' of time. We can speak of a 'space of time' but not a 'time of space'. She stresses that her argument does not rely wholly upon the etymology of single words, but on "widespread habits of speech" in "diverse languages", leading to:

> forms which all involve expressing the idea of Time by a spatial term … In truth we are not now considering merely a vocabulary or its derivation; we are discussing the *ideas* which suggested and developed the terms that symbolise them, and the empirical source of those ideas.
>
> (Welby, "Time as Derivative", 383)

Welby is arguing that as *all* temporal language derives from spatial language, our idea of time must derive from our idea of space. More deeply, she is concerned with the 'empirical source' of these ideas.

§4 considers these sources:

> I conceive that the idea of Time has arisen because … realising, experience in its aspect as a sequence of change, we need to measure it. Borrowing a space idea for the purpose, we measure it as a line … but it is only a metaphorical application of a space-idea, and for that reason has (as we have seen) to be content with an entirely borrowed vocabulary … Time … is in fact but an inference or a translation found expedient in practice, and has no existence in the sense in which Space has existence.
>
> (Welby, "Time as Derivative", 393–4)

Our idea of time *lacks an empirical source*, and time itself *has no existence* in the way that space does. This passage lays the foundation for my reading of "Time as Derivative". All *realisms* about time, including 'A-theory' and 'B-theory', order events by before and after. Additionally, A-theorists order events by present, past, and future. *Anti-realisms* about time hold that nothing is before or after (and certainly not past, present, or future). As I read Welby, she offers full-blown anti-realism about time.

Unlike our idea of time, she holds that our idea of space *does* have an empirical source: our perception of space and motion, via change.

[14]Other discussions of Welby on time – such as Schmitz ("Victoria Lady Welby's Significs", lxix) and Myers ("Welby", 19) – merely paraphrase her views without analysis.

"Change", Welby ("Time as Derivative", 396) writes, "as occurring in Space, with its conditional or concomitant motion, seems to be the central or original experience". §4 continues:

> Time is really the translation of diversity-*in*-position, through change-*of*-position, into succession; and is the effect of a mental condition corresponding to the pre-visual stage of sense-perception. Just as the blind man cannot see at once the scheme of objects, the 'scape' before him, but must touch one object after the other … so we cannot 'see' the Time-scheme as we can see the Space-scheme together in one act: and thus we erect 'past, present, future' … and tap our way through life, touching as it were each 'moment,' each unit of the Time – space.
>
> (Welby, "Time as Derivative", 395)

A little later, Welby ("Time as Derivative", 398) distinguishes two 'modes' of motion or change in space: 'the successive' and 'the simultaneous'. To illustrate, she writes that you can strike two musical notes "successively or simultaneously". I read Welby as claiming that we experience two kinds of change: simultaneous variety or 'diversity-*in*-position', such as a garden holding many kinds of plants; and temporal succession or 'change-*of*-position', such as a sprout growing into a sapling. Simultaneous variety is obviously a kind of change over space: the flowers are red here, and yellow there. Yet as I understand Welby, temporal succession is *also* a kind of change over space: the tree is a sprout here, and a sapling there. Strictly speaking, there is no temporal succession – it is just a 'translation' of simultaneous variety in space. But we have a 'mental condition' that prevents us from seeing the sprout and the bush spatially, as existing together. Welby's blind man cannot see the simultaneous variety of a garden, or any 'Space-scheme', as the 'one act' it really is: he can only 'touch' each plant in succession. Similarly, we cannot see the life of a tree, or any 'Time-scheme', as the 'one act' it really is: we can only touch each moment of time in succession. For Welby ("Time as Derivative", 397), our "mental blindness … creates the successive".

Given Welby's view that humans 'erect' past, present, and future, she is evidently not an A-theorist. Yet many of her claims are compatible with B-theory, which can be characterized more fully as follows:

> B-theorists think all change can be described in before-after terms. They typically portray spacetime as a spread-out manifold with events occurring at different locations in the manifold … Living in a world of change means living in a world with variation in this manifold … . [An] autumn leaf changed color … [if] the leaf is green in an earlier location of the manifold and red in a later location. The locations … are specific times in the manifold.
>
> (Emery et al, "Time", §5)

On 'typical' B-theories, ours is a block universe: it is an existing whole, a spread-out manifold of events, and there is no privileged present. On my reading, Welby's universe is a block, but she is *not* a B-theorist. This is

because, for Welby, our idea of time lacks an empirical source, and time does not exist outside our minds. Everything is really in space, but nothing is really in time. This means that Welby's manifold is space, not spacetime. For the B-theorist, a leaf is green at one location in the manifold and red at another – and these locations are *times*. For Welby, these locations are *spatial positions*.

To bring out the distinction between B-theory and Welby's anti-realism more clearly, consider the B-theorist's thesis that events really occur *before* or *after*. On my reading, Welby denies this. Nothing really happens before or after, because time is merely spatial 'diversity-*in*-position'. This is why Welby ("Time as Derivative", 385) characterizes before and after as spatial positions: "'before' is before a man in a place, on a spot, in Space, and 'after' is what follows or remains behind him". Her 1909 paper makes this point exceptionally clearly:

> We may agree that "the relations of earlier and later are permanent". But why? Because they are questions of position.
>
> (Welby, "Mr. McTaggart", 326)

For Welby, a leaf changes colour from August to September in *exactly* the same way different parts of a single leaf can be smooth and rough: change is diversity across space. Further, for the B-theorist, a world without conscious beings would still be temporal. As Bertrand Russell ("Experience of Time", 212) once wrote, "In a world in which there was no experience there would be no past, present, or future, but there might well be earlier and later". In contrast, given her view that time is only a mind-dependent idea, I argue that for Welby a world without conscious beings would not be temporal. In comments on a draft of "Time as Derivative", Welby's friend William MacDonald characterizes her theory in this way: "Before there was sentient being, there was matter extended and movable in space … but not in time, because … there was no Time until sentient being invented it".[15] This is not B-theory, but anti-realism.

Returning to the mental blindness which prevents us from seeing the world as it really is, §4 of "Time as Derivative" concludes:

> But for this disability, we could at will not only dissolve a picture into its successive acts of painting or into its constituent factors (which by means of photography we can now do) but we could even hear a symphony … as one transcendent Chord.
>
> (Welby, "Time as Derivative", 399)

The reference to photography we can 'now' do likely refers to Victorian inventions such as 1860s chronophotography, which captured motion through successive images; see Étienne-Jules Marey's horses in Figure 2. Chronophotography arguably spatializes time, by portraying a temporal process (such as

[15]The summary is in an envelope postmarked 1906. VWF, 1970-010/032-04.

Figure 2. "Arab horse at a gallop". Photograph by Jules Marey. This image is in the public domain, courtesy of Wikipedia Commons (https://en.wikipedia.org/wiki/File:%C3%89tienne-Jules_Marey_-_Arab_Horse_Gallup_-_Google_Art_Project.jpg).

painting) as a spatial series. Welby's personal papers include a 1904 *Nature* clipping about Rina Scott's pioneering time-lapse photography of plants. For example, Scott ("Movements", 780) showed the flowers of Sparmannia Africana slowly unfurling. Welby noted in pencil, "Thus time can be telescoped or microscoped. But space, its source … cannot".[16] Like Alice in Wonderland, time can be made longer or shorter, but space cannot.

Welby's approval of photography invites a detour into the work of French philosopher Henri Bergson, who famously rejected the spatialization of time, and these photographic techniques. For example, in 1889, Bergson (*Time and Free Will*, 98) critiqued accounts of time that fall "back upon space … really giving up time". In 1907, he argued that chronophotography and related art forms depict time spatially, and hence fail to capture the true nature of time. Bergson (*Creative Evolution*, 351) writes, "Of the gallop of a horse our eye perceives chiefly a characteristic, essential … form". In contrast, 'instantaneous photography' "spreads out" the horse's gallop, portraying mere "quantitative variations". As Bergson did not comment on photography before 1907,[17] Welby was probably unaware of his views when she wrote "Time as Derivative"; had she known, I imagine she would have rebutted them. For Welby, a horse's gallop *is* spatial variations.

Given their dissenting views on the spatialization of time, it is prima facie puzzling that §3 of "Time as Derivative" includes excerpts from Bergson's *Time and Free Will* that Welby takes to *support* her position. She places these alongside excerpts from another French text, Jean-Marie Guyau's 1890 *La genèse de l'idée de temps* (*The Genesis of the Idea of Time*). Welby ("Time as Derivative", 392–3) notes that she became 'acquainted' with

[16]Welby's papers are held in the Lady Victoria Welby Fonds, York University, Ontario (hereafter, VWF). The original clipping is in file 1970-010/032-07; a duplicate, with Welby's note, is in 1970-010/032-08.
[17]See Canales (*Physicist and the Philosopher,* 285, note 6), who also provides discussion of Bergson.

these texts after writing her paper, but they are important because "they are in a substantial agreement with its contention". She quotes Bergson's description of time as a "bastard concept" (*concept batard*), resulting from the intrusion of an idea of space into consciousness. She also quotes Guyau's description of time as a "simple effect of consciousness" (*simple effet de la conscience*); and his thesis that language shows our idea of time to be the product of evolution (*La philologie indique donc une evolution de l'idée de temps*). The commonality Welby finds with Guyau's position is obvious – and it suggests Welby endorses the thesis that we evolved our idea of time. But what is the commonality she finds with Bergson? I find Lovejoy's ("French Philosophy", 527) analysis of Guyau and Bergson helpful here: he writes that they "reached at least one common conclusion … our ordinary notions of time are deeply infected with imagery derived from our experiences of space". Lovejoy explains that they use this conclusion differently: Guyau takes it as a 'clue' regarding the spatial genesis of time perception; whereas Bergson argues space-infected time is false time, and accordingly finds Guyau's genesis theory 'inadmissible'. Although Welby is ultimately on Guyau's side, she shares Guyau and Bergson's 'common conclusion'.

Bergsonian detour over, let's return to Welby's anti-realism. With an eye to further elucidating it, I discuss three pieces of literature that (I find) misinterpret her position. First, Petrilli (*Signifying and Understanding*, 392) states that Welby's view "had a precedent in Aristotle who maintained that time is another way of saying motion"; Luisi ("Peirce and Welby", 202) echoes this. Petrilli rightly detects affinities between Aristotle and Welby: Aristotle connects time with measuring change, and – as we saw above – is often read as holding space to be conceptually prior to time. But to my mind, these affinities are dwarfed by a dissimilarity: Aristotle does *not* argue that time is unreal because time is literally a kind of space. Construing Aristotle's account as a precedent misses the originality of Welby's metaphysic. Indeed, I am not aware of *any* precedents to her metaphysic: she takes the spatialization of time to the utmost extreme.

Second, Luisi's study attributes the following views to Welby:

> We never feel or perceive time itself, but we live particular phenomena that force us to suppose the existence of time …
>
> she tries to show how illusory time can be when it is conceived as an absolute entity. Welby does not really stand against the experience of duration itself, but rather against the absolute time conceived by Newton …
>
> She refuses to allow a real existence to time …
>
> Of course we never perceive pure Newtonian time … but we still have some purely temporal experiences. For instance, when we listen to a melody, we perceive the sound lasting for a certain lapse of time … [and] the feeling … is not

> spatial at all … On the one hand there is no intuition of absolute time, but on the other hand we feel things lasting or changing … we can feel duration.
> (Luisi, "Peirce and Welby", 203–4; 211–12)

These passages seemingly contain a contradiction: Welby supposes the existence of time, *and* refuses existence to time. To explain this apparent contradiction, I interpret Luisi's reading Welby as follows. For Welby, we do *not* experience Newtonian absolute time; but we *do* experience duration, a "purely temporal experience", a "feeling … not spatial at all". Perhaps when Luisi writes that Welby supposes the existence of time, Luisi is referring to (what she believes to be) Welby's view that we experience duration. And, when Luisi writes that Welby refuses existence to time, Luisi is reasoning from a rejection of absolute time. Assuming this interpretation of Luisi's study is correct, I argue it incorrectly reads Welby as holding that we experience duration, understood as a non-spatial feeling. With respect, I do not find any textual evidence to support this reading. Bergson (*Time and Free Will*, 100) argues we experience duration whilst listening to melodies, so perhaps Luisi has misread the extent of Welby's agreement with Bergson. I am also unsure why Luisi takes Welby to 'stand against' Newtonian time; although Welby would certainly reject Newtonian absolutism, it is not an issue she discusses.[18]

Finally, Ingthorsson (*McTaggart's Paradox*, 64; 79–80) briefly touches on Welby's 1909 paper. He rightly denies that Welby is an A-theorist, writing that on her view past, present, and future merely express the perspective of conscious minds. Ingthorsson reads Welby as a B-theorist, holding that "in objective reality, there is … earlier than and later than". However, he adds that Welby's B-theory could be "more explicit", for her views are "tied to a peculiar view about time as a derivative of spatial motion, which I find difficult to understand as a view about what time *is*". I say Ingthorsson is right to wobble on the B-theorist reading. In this paper, Welby ("Mr. McTaggart", 327) states, 'When we say "whenever we judge anything to exist in time, we are in error' we are right, because existence in this sense depends on motion in space only". Presumably it is claims such as these that Ingthorsson finds less than explicit, and difficult. On my reading, this statement simply shows that Welby's anti-realism about time continued steadfast in her 1909 work.

When, and how, did Welby come by her views on time? I seek to answer these (not previously considered) questions via Welby's unpublished papers. In a letter to Cambridge philosopher F. C. S. Schiller dated 22 September 1901, Welby writes, "I have somewhat developed the ideas of time". By 11

[18] In §3, Welby ("Time as Derivative", 386) quotes H. N. Gardiner's critique of Newtonian absolute time, and comments approvingly that Gardiner highlights the 'confusion' resulting "from inconsistency in the use of the spatial terms". But Newton is not mentioned outside of Gardiner's quote; and Welby's stated interest in the quotation concerns terminology, not absolutism.

December 1901, she plans to treat the subject 'separately' (i.e. in a standalone piece).[19] Amongst Welby's unpublished manuscripts I have found eleven drafts of "Time as Derivative"; there may be more. The earliest draft is in an envelope labelled "TIME Paper 1902".[20] The date is plausible for, in a letter dated 23 October 1902, Scottish philosopher W. R. Sorley comments on the paper.[21]

I contend that the anti-realist, fully spatialized account of time found in this 1902 draft onwards constitutes a new phase in Welby's writings on time. To make this case, I set out Welby's early, 1880s writings on time. Welby's first, 1881 book *Links and Clues* contains what I believe to be her earliest account of time, an essay titled "The 'Now'":

> Let us try … putting ourselves into the "Now "of God for a moment, and out of our own earthly past, present, and future, into eternity; out of the "has been and shall be" into the IS … Let us thus try to get a fresh view of all the great cardinal truths … we shall get *dimly* a glimpse of eternal Fact: the changeless, the solid, the immovable; we are freed for an instant from the necessary bondage … of passing event … Only for moments can any soul thus penetrate here the time-veil … [we are] fettered by time barrier.
>
> (Welby, *Links and Clues*, 196–7)

From our earthly perspective, events are future, present, or past. Yet from God's perspective, nothing is past, present, and future; everything is 'changeless', 'solid', and 'immoveable' – it simply 'is'. God sees the world as it truly is, whilst we are usually prevented from seeing this by a 'time-veil' or 'time barrier'. This passage is advancing a block universe theory: all events – and the times at which they occur – exist changelessly; and nothing is really past, present, or future.

Welby's 1885 anonymous dialogue, "An Echo of Larger Life" writes of a people who:

> found that the earth was not flat but a sphere … [and realised] that "up and down" – above and below – were reversed to those at the "antipodes," and therefore had no real existence in space.
>
> (Welby, reprinted in Petrilli, *Signifying and Understanding*, 326)

To a person in London, 'upwards' refers to one direction. To a person at London's antipode (i.e. its geographically opposite part of the planet) in the Pacific Ocean, 'upwards' refers to the reverse direction – to what is, from London's perspective, 'downwards'. Hence 'upwards' and 'downwards' have 'no real existence in space': they are relative to a person's location. Eventually, the same people also discovered:

[19]VWF, 1970-010/014-06.
[20]VWF, 1970-010/032-03.
[21]VWF, 1970-010/015.

> that "past and future" were as purely relative to them as "upwards and downwards." … the same truth … applied to time; that there might well be an "antipodes" in that sphere too, where past and future were reversed.
>
> (Welby, reprinted in Petrilli, *Signifying and Understanding*, 326)

Welby is arguing that to a person at Time 1, 'past' refers to one direction; to a person at Time 2, 'past' refers to the reverse direction – to what is, from Time 1's perspective, 'future'. In claiming that it is a matter of perspective whether the time series runs from past-future or future-past, this passage affirms time's multi-directionality. This anticipates, by several years, Bradley's 1887 and 1893 view that the direction of time depends on our experience.

Although these 1880s writings contain elements that survive in the 1902 draft of "Time as Derivative" and its descendants, I do not find them to espouse Welby's mature anti-realist metaphysic. How then does her anti-realism develop? I locate a turning point in her 1891 correspondence with physicist Oliver Lodge. In 1891, Lodge gave an address, subsequently published in *Nature*:

> A luminous and helpful idea is that *time* is but a relative mode of regarding things … events may be in some sense existent always, both past and future, and it may be we who are arriving at them, not they which are happening … We perceive, therefore, a possible fourth dimensional aspect about time.
>
> (Lodge, "Opening Address", 386)

Lodge's 'luminous' idea, that events may be 'existent always', is of course shared by Welby. In a letter to Lodge dated 22 September 1891, Welby recounts annotating his address "from end to end", and her friends saying "why, that is just what you have been trying for years to make us understand!". In a reply dated 19 November 1891, Lodge restates his view: 'time' is "like a 4th dimension of space being traversed by us at a perfectly constant pace". Welby replies on 2 December 1891:

> your own thought of it [time] does all I want, which is to undermine the artificial barriers … created by the ordinary notions of 'time' … as all our terms for time are borrowed from one-dimensional space only, would it not seem likely that we are in a sort of 'Line-Land' in time answering or comparable somehow, as you suggest, to a fourth dimension in space?[22]

Linelanders perceive one dimension of space, yet there is more to space. We only perceive one dimension of time yet, Welby suggests, there is more to time. Picking up on Lodge's suggestion, Welby speculates that our 'Line-Land' of time is, or is similar to, a fourth spatial dimension. This letter bears on the origins of Welby's mature metaphysic in two ways: it contains (what I believe to be) the earliest expression of her view that time is a kind of space; and it is connected with discourse around the fourth dimension. I

[22]VWF, 1970-010/009.

argue Welby was closely familiar with this discourse, and it could power her view of time.

In addition to *Flatland*, Welby owned least two other books covering the fourth dimension: Hinton's 1888 *New Era of Thought*, and Alfred Taylor Schofield's 1888 *Another World; or, the Fourth Dimension*.[23] Her letters to Norman Pearson show she read Flatland by 1886, and *Another World* by 1892.[24] In a 1887 letter to Frederick Pollock, she even states, "some years ago I passed through what might perhaps be called a Hinton phase".[25] Further, in her first, 1897 letter to Wells, Welby applauds his "inimitable" *Time Machine*.[26] They corresponded until 1910, and Wells probably visited her; one of Wells' novels even refers to "Lady Welby's work upon Significs".[27] Frustratingly, their extant correspondence does not further discuss time or *The Time Machine*, but I wonder what Wells would have made of her mature metaphysic. Welby clearly felt an affinity between their views. In §5 of "Time as Derivative", Welby ("Time as Derivative", 400) describes the past and future as spatial locations: the past is "the world already explored by Man on his great journey through the life-country", and the future is "that which is yet below a given horizon … the world waiting for him". The published paper concludes by stating we must explore new, future 'continents' of Time. But the 1902 draft adds:

> This line of thought of course links itself to the theme of Mr. Wells' vivid romance of the Time Machine. He at least seems to see how elementary as yet our grasp of the possibilities of the 'time-space' are.[28]

Perhaps this conclusion did not make it into the published version because Welby worried that referencing science fiction might make her philosophy appear speculative.

I suggest Welby's evolution of thought between her 1881 "The Now" and 1902 onwards drafts of "Time as Derivative" ran as follows. "The Now" attributes three features to time: it is an existing whole, no part is privileged, and it is multi-directional. We regularly attribute these same features to space. Space is an existing whole: all spaces, such as those occupied by London, Jupiter, and Alpha Centauri, exist. No part of space is privileged: there is nothing special about standing in London over Beijing. Space is also multi-directional: we can move up, down, east, west. If you conceive time as having these spatial features, you could wonder *why* this is so. Conceiving time as a fourth dimension offers an answer: time has these spatial features *because* time is really space. "Time is Derivative" does not

[23]The Lady Welby Library catalogue, University of London.
[24]VWF, 1970-010/012.
[25]VWF, 1970-010/013.
[26]VWF, 1970-010/019-19.
[27]See Schmitz ("Victoria Lady Welby's Significs", clxxxiv–clxxxv).
[28]VWF, 1970-010/032-03.

identify time with a fourth spatial dimension, but it defends the basic thesis that time is a kind of space. An excised passage from *The Time Machine* states:

> To an omniscient observer … present and past and future would be without meaning … He would see … a Rigid Universe filling space and time … If 'past' meant anything, it would mean looking in a certain direction, while 'future' meant looking the opposite way.
>
> (Wells, quoted in Nahin, *Time Machines*, 113)

This passage would fit seamlessly into Welby's corpus. As I read her, Welby has put a metaphysic to the Wellsian zeitgeist.

5 Digging into Calkins and Welby's disagreement

Having explored their respective accounts of time, let's examine the Calkins-Welby dispute. Welby's critique of Calkins (given in full at the start of this paper) occurs in §3 of "Time as Derivative". It attacks Calkins' view that succession is the real nature of time, where succession is understood as 'restlessness' – an irrevocable, fleeting stream of moments. Welby's critique comprises two objections. One is that it is inappropriate of Calkins to endow time with a "restless nature", for such a description can only "apply in the organic sphere". Later, Welby ("Time as Derivative", 392) complains that time does not just borrow its terminology from space – but also from 'Life'. Perhaps Calkins would reply to this that restlessness *can* apply beyond the organic sphere: for example to oceans, or stars. I do not find that this objection gets to the heart of their disagreement over spatializing time. However, the other does.

Welby's other objection is that, by identifying time with succession understood as restlessness, Calkins is "doing violence" to our "instinct of requiring Time as Space" to "journey through life – moving ever forward". To understand this, I refer to a later discussion, where Welby ("Time as Derivative", 390) rejects the notion that humans have a 'time-measuring faculty'. Instead, she claims that humans – and even some plants and animals – share a faculty to "automatically gauge" succession. Of course, this is 'succession' understood in Welby's sense – as change in space:

> succession … the condition of arrival at a given point in an experience-space: in the space, viz., which is the condition of that forward movement of mind which we call experience and for which we must have room. Life seems to have an instinctive 'sense' of where it is.
>
> (Welby, "Time as Derivative", 390)

Welby is arguing that humans lack a time-measuring faculty, but we possess a faculty or instinct for gauging succession – for locating ourselves in space, *and in time understood as space*. As we have seen, Welby describes before

and after, past and future, as spatial locations. By her lights, when we look towards our future journey through life, we instinctively conceive the future as a space. Welby reflects on this in a note dated 27th April 1907, her 70th birthday:

> 70 years of what? Of life, experience … 70 years in what? Space. The space in which mind advances forward … [29]

For Welby, a condition of the mind's movement through life is that there is a future space or 'room' awaiting us. The mind's movement through 'time' requires that 'temporal' succession is understood spatially. This is utterly at odds with Calkins' distinctively temporal account of temporal succession. Calkins states that moving from east to west is unlike moving from past to present; for Welby, moving from east to west is precisely like moving from past to present.

As Welby's critique highlights, her disagreement with Calkins concerns the nature of time: for Calkins, the essence of time is non-spatial, temporal succession; for Welby, time is literally space. But we can go deeper than this. We have seen that Welby holds our idea of time to be sourced in our experience of space, whereas Calkins holds our idea of time to be sourced in our experience of time. We have also seen that Welby makes an extra step: reasoning from our lack of temporal experience, to the unreality of time. I argue that Calkins makes the same step, but in the opposite direction: reasoning from our temporal experience, to the *reality* of time.

Calkins' 1899 paper does not explicitly consider the reality of time, but the first, 1907 edition of her *Persistent Problems* does. In its final chapter, "Contemporary Philosophical Systems", Calkins (*Persistent Problems – 1907*, 440–1) considers one of the 'most insistent' problems facing Absolute idealism: the relation of the Absolute and finite selves to time. On the one hand, Calkins argues the Absolute is *not* temporal. This is because the Absolute is complete, and the temporal is not. She claims the temporal is "essentially incomplete" because temporal moments have "both past and future", "relations to the irrevocable and to the unattained". Calkins (*An Introduction to Psychology*, 300–1) claimed our idea of the 'future' is 'highly complex', for it includes a 'consciousness' of the 'connection' between any one moment and all other moments. "Every moment … is realised … as that-which-is-always-linked-in-two-directions, with its past and with its future". It is these connections that render the temporal incomplete. From the non-temporal perspective, Calkins (*Persistent Problems – 1907*, 444) conceives the universe as a "complete … non-temporal, whole". In other words, we live in a block universe.

[29]VWF, 1970-010/032-01.

To take another Bergsonian detour, Calkins' block universe theory emerges exceptionally clearly when she compares her ontology with Bergson's, in the 1925 edition of *Persistent Problems*. The final chapter, which is substantially rewritten and retitled "Twentieth Century Philosophy", considers Bergson's work as a 'revolt' against Absolute idealism:

> *The revolt against the conception of the universe as fixed: the philosophy of change*
>
> The doctrine of Henri Bergson may well be chosen as typical …
>
> "Reality," he says, "is a perpetual growth" …
>
> [On this view] the universe as a whole changes, grows …
>
> The objection … is to the completeness … of Absolute Being.
>
> (Calkins, *Persistent Problems – 1925*, 437–41)

Calkins reads Bergson as positing a growing universe, an ontology in conflict with Absolute idealism's block universe:

> the strictly absolute being is literally *all*-including, complete being. Nothing can be either conceived or imagined as existing beyond or outside it, consequently nothing can be future to it, or irrevocably past …
>
> the Absolute is no ultimately changing being, for that which changes is by definition incomplete … Since he is all-including, nothing is unreal to him, nothing is *from the Absolute's standpoint* past or future.
>
> (Calkins, *Persistent Problems – 1925*, 440; 460)[30]

Despite their differences, Calkins and Welby agree in rejecting Bergson's growing universe in favour of a rigid, complete block.

Returning to the previous discussion, Calkins writes that, on the other hand, the Absolute *is* temporal. Calkins (*Persistent Problems – 1907*, 422) claims the Absolute self can differ from human selves by virtue of its absoluteness, but "not by virtue of its selfhood". Consequently, the Absolute self must share our experiences – including our temporal experiences:

> Time is … real: the temporal consciousness is a *bona fide*, an actual experience … it is, in fact, the background and frame of a great part of our consciousness … And the absolute self must therefore be conceived as temporally conscious, that is, as participating in the consciousness of the connection of the irrevocable with the unattained.
>
> (Calkins, *Persistent Problems – 1907*, 441–2)

[30]Writing of the 1925 edition, McDaniel ("Calkins", 146–7) briefly asks whether this last remark implies that Calkins is a realist or anti-realist about time. Although I lack space to argue the case, I find Calkins' 1925 discussion of time to espouse the same theses as her 1907 one; admittedly, the 1925 discussion is heavily condensed.

The Absolute experiences the irrevocable and the unattained: past and the future.

How can the Absolute be temporal, and not temporal? Drawing on Royce, Calkins (*Persistent Problems – 1907*, 442) claims the Absolute possesses a "temporal" and "deeper-than-temporal" consciousness. This is possible because humans also possess both kinds of consciousness: like Royce, she argues that when we listen to music, we can experience a series of beats as a temporal succession, *and* as a present whole. Calkins (*Persistent Problems – 1907*, 444–5) concludes that the Absolute is conscious of the universe "after the temporal fashion", and as "a non-temporal, whole". Thus, time has a 'partial reality'. It is rare for an Absolute idealist to affirm that the Absolute is temporal in *any* sense, and I take this as further evidence of Calkins' non-Bradleyian line.

There are reasons to think Calkins would have accepted the partial reality of time in 1889 also. One is that there are other continuities between her 1889 and 1907 work on time. For example, the latter briefly reiterates her causal account of time: Calkins (*Persistent Problems – 1907*, 345–6) writes that Schopenhauer's work "rightly" teaches that the "relatedness of phenomena" is the "fundamental category", yet is "defective" in denying "the close likeness of time and causality". (These remarks remain through all the revised editions of *Persistent Problems*.) Another is that Calkins continually stresses the importance of experience to metaphysics. As she wrote in 1899, a theory of time "must meet the test of correspondence with admitted facts of consciousness". A metaphysic that wholly denied the reality of time would surely fail that test. This suggests that, back in 1899, she would also accept that, as we experience time, time has at least partial reality.

To my mind, this excavates the real root of the Welby-Calkins disagreement: Welby is an anti-realist about time, whereas Calkins is a partial realist. Their clashing metaphysics of time explains their clash over temporal experience, which in turn explains their disagreement over the spatialized nature of time. If Calkins and Welby had connected further, they would have had lots to talk about.

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