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Imperial Standard Time

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Abstract

This article examines the establishment of globally standardized time under law in colonial India. Despite pretensions to abstract universality, globally standardized time was and remains a particular construction, built on the basis of particular interests. Since its creation, select parties have competed to dominate the production and operation of globally standardized time, and their competition has been steeped with law. In short, globally standardized time and what we today call transnational law are mutually implicated in the construction of one another. The history of their interaction in colonial India makes clear the ways they work together as a sort of technology, produced and maintained for particular purposes. Those purposes include the capacity to stabilize expectations and establish normative baselines in support of transactional networks across borders, and ultimately around the world. The process continues to this day, with standardized time and law interacting to enable and disable a changing array of legal practices and expectations internationally. The establishment of globally standardized time under law in colonial India reveals the foundations of this interrelationship, including imperial interests and ideologies embedded in its material development.

1 Introduction

This article examines an episode in the co-production of globally standardized time and what has come to be called transnational law, including international law. The episode concerns the establishment of globally standardized time under law in colonial India. Globally standardized time was constructed in the 19th century to be a universal measurement comprising equivalent abstractions, i.e., uniform units of seconds, minutes and hours working in lockstep around the world.[1] Despite the abstractions and universality, however, globally standardized time was and remains a

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[1] I explore a different episode, focusing on 19th and 20th century developments in the US and England, in Gordon, 'Railway Clocks', in J. Hohmann and D. Joyce, *International Law's Objects* (2018).

particular construction, reflecting particular interests that have gone into its production and reproduction. Since its creation, select parties have competed to dominate the production and operation of globally standardized time, and their competition has been steeped with law: international law has been mobilized to enact and maintain globally standardized time; the interests at stake have been backed by law; and globally standardized time has enabled new legal practices, disabling others. In short, globally standardized time and transnational law are mutually implicated in the construction of one another.[2] The history of their interaction in colonial India makes clear the ways they work together as a sort of technology, built and maintained for particular purposes. Those purposes include a capacity to stabilize expectations in support of transactional networks across borders, and ultimately around the world, disembedding them from local normative constraints.

Just as international law has worked to establish globally standardized time as a normative baseline all around the world, globally standardized time has worked to establish normative baselines in international and transnational law. The process continues to this day, with standardized time and law interacting to enable and disable a changing array of legal practices and expectations internationally. The establishment of globally standardized time under law in colonial India reveals the co-constitutive foundations of their interrelationship. On this basis, the history relates both to perennial and contemporary inquiries into temporal dimensions of international and transnational law. Below, in section 2, I review issues of time and law raised in international legal scholarship. In section 3, I further elaborate what I mean by terms and concepts like transnational law, colonial governance, and stabilizing expectations; and additionally explain certain issues associated with standardized time. In section 4, I offer a history drawn from the latter half of the 19th and first half of the 20th centuries in colonial India. In section 5 I conclude with summary arguments.

2 Time and International Law: Dilemmas in Theory and Practice

Time is an integral part of international law, and time standards raise perennial issues in international legal practice.[3] In her article 'Time and the Law: International Perspectives on an Old Problem', Rosalyn Higgins emphasized that 'the concept of time plays an important part … in international law', with the intent to demonstrate two things: first, that in international law, 'temporal matters are all around us; and, second, that they are a necessary incident to the resolution of important matters of

[2] My analysis draws on ideas of co-production and co-constitution developed respectively by Jasanoff and Latour, among others. Exemplary works include: S. Jasanoff (ed.), *States of Knowledge: The Co-production of Science and the Social Order* (2004); and B. Latour, *We Have Never Been Modern* (1993).

[3] Deák, 'Computation of Time in International Law', 20 *American Journal of International Law (AJIL)* (1926) 502; Wilson, 'Time and International Law', 34 *AJIL* (1940) 496.

policy'.[4] Her inquiry proceeded from an acknowledgment of the 'felicitous fiction' of standardized time, represented by the Greenwich Meridian, which she recognized as a particular construction at odds with other time standards, such as indigenous times in Australia. Her inquiry closed with a brief passage from J. Alfred Prufrock, bringing to mind T.S. Eliot's critique of mechanically-measured, linear time (adopted from Henri Bergson).[5] In between, Higgins focused on four sets of dilemmas, which she referred to under categories of 'now and then', 'then and now', 'long enough time', and 'too long ago'.

Still more recent inquiries explore matters of time to raise questions about the nature of international law-making and even international law itself. Tommaso Soave explains current interests:

> relatively little attention has thus far been devoted to the role of time in lawmaking processes. In particular, few works exist that explore the manner in which temporal narratives can be appraised, constructed and invoked as a technique to legitimize regulatory action. Yet … time is an essential component of the sociopolitical struggle leading to the creation, modification and termination of legal norms.[6]

Renissa Mawani has lately addressed that gap, examining the interplay of law and temporality in colonial contexts, including India.[7] She demonstrates how 'juridical concepts, legal discourses, and legal authority are underwritten by and draw their meanings from the production, specification, and arrangement of times'.[8] More than that, Mawani offers a compelling description of ways in which 'time is integral to the ontology and epistemology of law. It is equally significant to law's organization of social and political life.[9] In a similar vein, Thomas Schultz refers to 'different possible temporalities, or life cycles, that structure international law-making'.[10] He proposes to investigate the 'temporalities of how we think of international law as international law in the first place', because those temporalities 'offer an alternative set of ways … to understand the creation of norms of international law'.[11] Investigating temporalities provokes such fundamental questions as:

> What is international law in the first place? Who gets to say what it is? If someone wants to make international law, what sort of things do they have to 'make'? Who can make these things? Who gets to say who can make these things? Why do those who get to say who can make these things get to say it? What does it take to change all of this?[12]

4 Higgins, 'Time and the Law: International Perspectives on an Old Problem', 46 *International & Comparative Law Quarterly* (1997) 501.

5 N. Gish, *Time in the Poetry of T. S. Eliot: A Study in Structure and Theme* (1981).

6 Soave, 'The Politics of Time in Domestic and International Lawmaking', in L. Pasquet, K. Polackova Van der Ploeg, and L. Castellanos-Jankiewicz, eds, *International Law and Time: Narratives and Techniques* (2019, forthcoming).

7 Mawani, 'Law as Temporality: Colonial Politics and Indian Settlers', 4 *UC Irvine Law Review* (2014) 65.

8 *Ibid.*, at 71.

9 *Ibid.*, at 71.

10 Schultz, 'Life Cycles of International Law as a Noetic Unity: The Various Times of Law-Thinking', in Pasquet, Polackova Van der Ploeg and Castellanos-Jankiewicz, *supra* note 6.

11 *Ibid.*

12 *Ibid.*

Fleur Johns, also investigating 'international legal temporalities', raises more specific questions about the respective times of human rights law and global finance. She asks

> to what extent … does international human rights law install or assert rival temporalities to those commonly associated with, and mobilized for and through, the nation-state? How might any such rival temporalities relate to the times and timings of global finance capital? What, moreover, may be some ramifications of such rivalries for those engaged in international legal work?[13]

The several questions raised by Schultz and Johns demonstrate the combination of foundational and practical questions raised by the interplay of time and law. The history that I tell below, focused on colonial India, addresses their questions with an account of privileged parties competing to make law and stabilize expectations on the basis of rival temporalities.

The recent scholarship emphasizes the political nature of the interaction between time and international law. Gregory Messenger refers to temporal choices and interests under international legal practice, with political consequences 'which may or may not be coincident with the desires of society or States at large'.[14] Mawani, Schultz and Soave all describe struggles to dominate temporal dimensions of international law.[15] Mawani in particular describes the pervasive and ongoing colonial politics of their interrelationship.[16] Further, the politics of the interplay between time and law in this context extend from institutional to individual consequences. Keebet von Benda-Beckmann observes that '[t]emporalities are not just aesthetic qualities of law, they also have important implications for social practices. People differ in the positions they assume in these temporalities and they have different possibilities as to how they leverage them.'[17] One obstacle to proper research into the politics of time and international law, however, is the degree to which the notion of time is taken for granted, individually and institutionally, in legal practice and beyond. As Soave has put it, the politics of time and law 'have become so deeply ingrained in our routines that we often fail to recognize them [and] they have acquired the self-evident characteristics of … that which is "beyond question"'.[18] Against that tendency, 'a proper understanding of how such politics work would greatly enhance our grasp of the outcomes of national, supranational, and transnational lawmaking processes'.[19]

My study here addresses the politics in historical perspective, investigating moments from the struggle at the turn of the 19th into the 20th century to produce and dominate globally standardized time under law. But where other studies have examined

[13] Johns, 'The Temporal Rivalries of Human Rights', 23 *Indiana Journal of Global Legal Studies* (2016) 39, at 40–41, 43.

[14] Messenger, 'The Development of International Law, Perception, and the Problem of Time', in Pasquet, Polackova Van der Ploeg and Castellanos-Jankiewicz, *supra* note 6.

[15] Soave, *supra* note 6; Schultz, *supra* note 10.

[16] Mawani, *supra* note 7, at 65.

[17] Von Benda-Beckmann, 'Trust and the Temporalities of Law', 46 *The Journal of Legal Pluralism and Unofficial Law* (2014) 1.

[18] Soave, *supra* note 6.

[19] *Ibid.*

ways in which time works to structure law, law-making and legal relations, the history here also demonstrates the ways in which law has structured time and contributed (reciprocally) to the construction of the 'felicitous fiction' that Higgins recognized at work in the law. Observing their mutual interaction in colonial India reveals what von Benda-Beckmann refers to as 'the temporalities encoded into law itself', with the history here including also the temporalities reciprocally encoded *by* law. Together they represent 'an important aspect that literature about time and law fails to address'.[20] Von Benda-Beckmann describes the importance for legal outcomes: 'Temporalities within law affect the specific ways in which rights, obligations, and prohibitions entailed in legal relationships, institutions, and procedures are positioned in time, and the differential ways in which these temporalities affect the outcome of legal procedures and decisions.'[21]

As contemporary interest attests, globally standardized time and transnational law, including international law, continue to affect one another on an ongoing basis, each contributing mutually to the reproduction of the other, but with periods of change and conflict in their interaction. Though the account in section 4 will be trained on colonial India, let me point out here, and again in the conclusion, several issues for which the mutual implication of time and law described in section 4 carries ongoing significance. I have already referred to Johns' inquiry into the competition between temporalities of human rights law and global finance. Her analysis points to one of the primary areas where change in the interaction of time and law is becoming more visible: namely, in the practices associated with global financial markets and the rules regulating them. The history below anticipates that development, revealing the fundamental role of capital and markets in the production of globally standardized time under transnational law.

Today, James J. Angel describes regulatory dilemmas that arise out of the change in market operations from human-scale time to computer-scale time, with transactions now approaching the speed of light. His basic point is a simple one: 'Just as intuitions gained from low-speed Newtonian mechanics need to be modified near the speed of light, intuitions—and regulations—gained from low-speed markets also need to be modified as trading approaches the speed of light.'[22] Angel observes five categories of regulatory concern affected by the changing valence of time under law: 'consumer protection, fairness, resource allocation, economic efficiency, capital formation, soundness of financial institutions, and economic stability'.[23] The history of colonial India suggests that the lens can be pulled back still farther to look at how the changing valence of time in global financial markets has wider governance effects in social and legal realms beyond the specific practices of global finance. Moreover, the issues that arise out of high speed transactions in global finance are related to another emergent

[20] Von Benda-Beckmann, *supra* note 17, at 4.

[21] *Ibid.*, at 4.

[22] Angel, 'When Finance Meets Physics: The Impact of the Speed of Light on Financial Markets and their Regulation', 49 *The Financial Review* (2014) 272.

[23] *Ibid.*, at 274.

field of concern in inter- and transnational law: internet governance, including big data and blockchain technologies. Each of these things, like high-speed financial transactions, rely on digital time stamps: without them, the internet does not exist as we know it, and blockchains do not exist at all. Through digital time stamps, the international law set out in section 4 is directly implicated in one of the crucial areas of unified control applicable to the distributed architecture of these global technologies. Despite their distributed architecture, the blockchain, like the internet and every digital transaction (financial or otherwise), all rely on a singular technology subject to consolidated global administration: namely standardized time, in the form of Universally Coordinated Time (UTC), the title of globally standardized time under international law since 1967 told in section 4. UTC today is derived from International Atomic Time (TAI), which is produced and regulated by the Bureau des Poids et Mesures, an intergovernmental regulatory body, in consultation with the Radiocommunications Sector of the International Telecommunications Union (ITU-R), a UN agency, and a limited number of national laboratories around the world.

TAI and UTC point to a final area of significance for international and transnational law, namely infrastructure. Global infrastructure elements are receiving new interest in legal scholarship. The recent InfraReg project is an example. The project proceeds from the proposition that '[i]nfrastructures—whether physical, informational, digital—can have regulatory-type effects … [and] help to shape second-order regulatory-type actions and structures. When stable, these infrastructures exert substantial power in social ordering. They interact or compete with law.'[24] Globally standardized time under law is a powerful infrastructural technology, enabling countless other technologies and conditioning social order with 'regulatory-type effects'. It functions, like the infrastructures that Merry and Kingsbury investigate, as a 'transmission belt … from the global to the local, where [it] regulate[s] people's lives, and affect[s] their relative and total income, power, capabilities, and life-possibilities'.[25] Their methodological statement applies equally well to this historical investigation: '[i]nvestigating "infrastructures as regulation" thus requires looking beneath or beyond what is directly expressed by decision-makers, and excavating the (non-regulatory) narratives and ideologies about infrastructures that play a part in their regulatory effects'.[26]

The history here, however, is not solely the history of a technology or infrastructure. It is also a history of one of international law's most powerful pretensions to universalism. When the American Society of International Law commemorated its centennial in 2006, it produced a list of 100 accomplishments to celebrate: universal time calibrated to the Greenwich Meridian was first.[27] Its universality is at once real and unreal: it is ubiquitous, used universally as a standard time-keeping measurement; yet it is hardly the only one, and it is not uncontroversial. The mutual operation of globally standardized time and law has recently been problematized by scholars

[24] Infrareg, available at https://www.iilj.org/infrareg/infrareg-project/.

[25] *Ibid.*

[26] *Ibid.*

[27] L. Low, *International Law: 100 Ways It Shapes Our Lives* (2006).

and activists engaged with indigenous peoples and movements, among others. Mark Rifkin refers to 'temporal tensions—ways that Indigenous forms of time push against the imperatives of settler sovereignty'.[28] The imperatives of settler sovereignty are constituted by linear clock time, operating according to globally standardized time, and made manifest by Indian law and policy, among other things, applied to indigenous communities.[29] Rifkin's goal is 'to pluralize temporality so as to open possibilities for engaging with Indigenous self-articulations, forms of collective life, and modes of self-determination beyond their incorporation or translation into settler frames of reference'.[30] An ambition of the history below is to investigate, and in the process provincialize, the otherwise universal standard of time that supports the settler frame of reference, among other things, under international and transnational law.

3 Clarifying terms

Before proceeding to the historical account in section 4, I will first elaborate on my use of terms and concepts (A), such as transnational law, colonial governance, and the stabilization of expectations; then offer some further methodological observations about the construction of time (B).

A *Transnational Law, Colonial Governance and the Stabilization of Expectations*

The term 'transnational law' only gained widespread currency following Jessup's seminal definition from 1956: 'all law which regulates actions or events that transcend national frontiers … [including] public and private international law … [and] other rules which do not wholly fit into such standard categories'.[31] Jessup's definition includes everything from treaties of international law, to coordinated acts of national law with international ramifications, to administrative decisions by state and intergovernmental agencies, to transactions among so-called private actors across national borders. The larger narrative of the co-production of standardized time and transnational law encompasses all of these things, including: the 1884 International Meridian Conference, among a host of other conventions; the decision of the 13th General Conference on Weights and Measures, part of the Bureau International des Poids et Mesures, to adopt a singular global standard for the duration of units of time; the 1880 British Definition of Time Act, etc. But I also arguably go beyond Jessup's definition, as others have done, to include still other practices within the ambit of (early) transnational law.[32] I focus especially on relations and practices at different

[28] M. Rifkin, *Beyond Settler Time: Temporal Sovereignty and Indigenous Self-Determination* (2017), at ix.

[29] *Ibid.*

[30] *Ibid.*

[31] P. Jessup, *Transnational law* (1956).

[32] Perez, 'Purity Lost: The Paradoxical Face of the New Transnational Legal Body', 33 *Brooklyn Journal of International Law* (2007) 1, at 3; and Blackett, 'Globalization and Its Ambiguities: Implications for Law School Curricular Reform', 37 *Columbia Journal of Transnational Law* (1998) 57, at 67.

scales, implicating diverse borders internationally and effecting or affecting governance conditions under law. Two examples from the story below include the protracted negotiations between the UK Colonial Office and local Presidencies in colonial India, with changing results for rules governing local times; and the conflicts among the multinational constituents of the self-governing institution of then-Bombay, with respect to its decision to adopt one time or another for purposes of standardization. These acts and others all fall within the larger narrative ultimately celebrated by the American Society in its centennial publication, mentioned above. Not only was universal time calibrated to the Greenwich Meridian first on the list; but uniform units of time measurement were sixth.[33] Those achievements were not the product of the 1884 International Meridian Conference alone, but a function of many transnational legal acts involving actors across a number of jurisdictions operating at a variety of scales. For that reason, my use of the term transnational law includes the category of international law.

The valence of law and legal practice in this context may look peculiar from a traditional public law perspective. Its seeming peculiarity is related to a colonial context in which imperial authority had belonged under law to The East India Company, a private global enterprise organized for profit by plunder, which had exercised governance powers in so-called trust for the British Crown until the Indian Rebellion of 1857. Company raj, as it was known, had dominated the public and private spheres that structured colonial India, combining political authority and military powers with the corporate enterprise of the East India Company. The administrative dimensions of the present account, mixing private and public concerns as a matter of policy, reflect this history. Legal practice in such context takes a variety of forms and is differently embodied than the classical image of public law practice might otherwise allow. My argument, however, is that what counts as legal practice in this context is not so unusual and is arguably of particular relevance today. The context of colonial India makes clearer the work of transnational legal practices in a number of contexts where law and governance are entangled with private interests in a wider terrain of expansive economic structures and deformalized normative constraints. Under these conditions, standardized time provided a temporal basis under law to stabilize select expectations spanning the globe.

Carol Greenhouse has made clear that time – not just standardized time – has been consistently crucial to governing regimes, but differently according to different contexts and values of time.[34] There are at least two different governing contexts at play in colonial India for relevant purposes. The first concerns the administrative contest to govern (parts of) colonized India, waged among private and public actors in local offices, regional administrative departments and imperial headquarters. Deployed and

[33] Low, *supra* note 27.

[34] C. Greenhouse, *A Moment's Notice: Time Politics across Cultures* (1996). I rely on her work, together with the cited works that follow in notes 35 and 36 (Valverde, Luhmann) for similar purposes in 'Railway Clocks', *supra* note 1.

contested as a facet of colonial governance in India, the technology of standardized time was central to the mixed administration of private and public interests effected pursuant to the constellation of corporate and political powers that dominated India under imperial control. The account I develop here makes clearer some of the values that vied for primacy in this governance context, together with the technologies that facilitated and constituted them, contributing to an account of the values incorporated in materialized networks of transnational legal relations. The second governing context may be described in terms of a rationalized vocabulary for speaking the world, bidding for hegemony. This vocabulary identifies the interests of the scientist and merchant with ideological supports for enlightenment political projects, such as rationality and progress, associated with so-called Western modernity and mobilized to perpetuate empire. Railways, merchants and scientists appear to have played special roles in establishing the primacy of these values, and instrumentalizing them.

The relations furthered by the mobilization of standardized time and transnational law formed ordered networks defying traditional legal and political delimitation. In addition, the growing spread of standardized time with transnational law allowed growth in the networks and relations they enabled, establishing conditions of possibility for developments like so-called global value chains today. Mariana Valverde has demonstrated the joined nature of legal, spatial and temporal categories in her studies of jurisdiction with reference to Bakhtin's chronotope.[35] In this context, I am looking at an episode that reflects how the three have operated together in a global register. The meeting point, so to speak, for their mutual operation is established by the capacity to stabilize expectations.[36] Standardized time defines a common temporal basis for expectations. It is capable of establishing conditions conducive to the management of expectations and the transactions into which they are inscribed, for instance in contracts and the property interests they underwrite. In this way, the power over time arising out of administrative policy contests and choices in colonial India suggests how transnational networks and governance practices took shape across diverse normative environments, and despite contestation. In the imperial context of colonial India, standardized time provided a common temporal language to enable expectation management for market-oriented and administrative purposes, including jurisdictional capacity, covering increasing amounts of space and territory.

B *Time, Machine*

The historical account that I offer below straddles the moment of Einstein's revelation of special relativity. The theory of special relativity does not exactly fall within the scope of this limited investigation, but it is at work in the background. In the story below, the construction of globally standardized time proceeds against imperial ambitions to govern by means of abstractions, rationalized conceptions of time and time measurements, conceived to be linear and simultaneous. Special relativity reveals the

[35] M. Valverde, *Chronotopes of Law: Jurisdiction, Scale and Governance* (2015).

[36] N. Luhmann, *Law as a Social System* (2004).

impossibility of that project on multiple levels: the rationalized abstraction is not the same as its material reality, and true simultaneity over distance was never possible.[37] In short, globally standardized time has not been built out of a true or transcendent theory of time. It has been built, that is all. This central insight provokes questions like: What is globally standardized time built *for*, and *how* is it built? The account below offers a partial answer to these questions, which I have by now outlined: in its mutual inter-operation with law, globally standardized time has been built to stabilize some expectations, privileging them above others under transnational law.

Peter Galison, as part of a mixed media collaboration with William Kentridge entitled *The Refusal of Time*, offers a useful anecdote about the construction of globally standardized measurement. On 28 September 1889, delegates of 18 states gathered outside Paris to unify internationally the measures of the metre and kilogram, celebrating a single metre stick and a single sample weight selected to serve as prototypes. Copies of the prototypes were made and distributed among the delegates. The originals were put in separate containers, then sealed in the same triple-locked vault and stored in a basement room at the Bureau International des Poids et Mesures behind two doors and an additional three locks. 'At that moment', Galison writes, 'two of the most precisely forged and measured objects in history, the most individually specified human-made things, became, in burial, the most universal.'[38] They have become universal beyond the grave, but not constant within it: the entombed kilogram has been losing weight. Galison offers the anecdote specifically for what it says about time: the measure of globally standardized time is socially and materially constructed. In short, it is what we make of it. The historical investigation makes clearer what we have made of it.

Let me clarify two points about this 'we' before proceeding. First, this 'we' is not inclusive. Particular groups of elite men fought and constructed globally standardized time into existence, sometimes in contest with one another, for particular interests that they held. I offer a part of that imperial history below. Following the events below, the hegemonic position staked out for globally standardized time has been deepened and extended. In the process, the 'we' expands, and its action changes. Globally standardized time is today mobilized, relied on and taken for granted all around the world. A far more inclusive group, myself included, reproduces this time, though we were hardly present at decisive stages of its construction. But continuity in the historical construction observed here underscores that this thing remains what we (re)make of it. This connects with the second point about this 'we'. It is not just people: it is a technology comprising an ensemble of people and things. People cannot tell globally standardized time without an array of specific devices and things. The mix of these devices and things, like the mix of people relying on them, changes. Such changes will be apparent already in the limited history below.

[37] Einstein, 'On the Electrodynamics of Moving Bodies', in A. Miller, *Albert Einstein's Special Theory of Relativity: Emergence (1905) and Early Interpretation (1905–1911)* (1981).

[38] Galison, 'The Refusal of Time', in '100 Notes – 100 Thoughts, No. 009', 13 *documenta* (2012) at 2.

Throughout these changes, globally standardized time remains only ever what the technology makes it. And by technology here I mean the total ensemble, including people and techniques and machines and things. 'We' are part of what Galison represents as 'a planetary machine [to] bring the world under one ticking clock'.[39] This machine, however, the technology and network, does not make time equally for all purposes: it works – we work – better for some people and purposes than others. We do not all benefit equally as a result. For many quite the opposite. Because while the construction of globally standardized time was a messy process, its results have been consistent: among them, growing markets for industrial goods, exhibiting regular distributive patterns. That consistency, however, is not immune to forces of material, historical change. Though its abstract units have remained relatively constant, the rationalized, linear nature of globally standardized time, together with the market practices it supports, is breaking down under contemporary conditions.[40] In short, there is continuity and contradiction in its historical and material development, which contribute to the politics of its mutual interaction with law. Before proceeding, then, a double irony should be clear: the variety of events that follow were hardly linear in their contribution to the construction of globally standardized time; and the globally standardized time which they ultimately yielded has not sustained the pretence to linearity that was crucial to its construction.

4 Making the Time: A History[41]

The history below includes the interaction of material and immaterial things: clocks, laws, cables, time measurements, people and ideologies, etc. A combination of observatories, telegraph lines and railway tracks made possible the production of standardized time, and with it the co-production of transnational legal relations and colonial interests in India under British rule. The structural dimensions of these linked things had particular effects. Until the late 19th century, there was only one observatory in India equipped to distribute time signals, located in Madras.[42] This situation privileged Madras time-keeping standards *vis-à-vis* other urban centres such as Bombay (as Mumbai was named under imperial rule), a source of conflict with repercussions throughout the story that follows. On the other hand, the wide distribution of individual clocks and separately kept time-keeping devices in Bombay and other urban centres pushed back against the coordination necessary to the co-production of standardized time, transnational legal relations and colonial interests.

[39] *Ibid.*, at 3.

[40] Angel, *supra* note 22, at 271; Hope, 'Conflicting Temporalities: State, Nation, Economy and Democracy under Global Capitalism', 18 *Time & Society* (2009) 62.

[41] The narrative here is drawn from the archival work of others. Chief among them are Ritika Prasad, Vanessa Ogle, Shekhar Krishnan and Jim Masselos.

[42] S. Krishnan, *Empire's Metropolis: Money, Time & Space in Colonial Bombay, 1870–1930* (2013) (PhD thesis on file at MIT), at 40.

The historical interrelationship was contested on several levels: there was a contest to dominate the terms of local and standardized time, together with a contest to dominate the forms and powers of government and administration in colonized India; and there was resistance to the construction and adoption of standardized time as part of the broader imperial project. The contests that I review here, however, do not tell the whole story. They revolve around contestation among differently situated elites, local and colonial, over the indices – regional, national and international – by which uniform, clock-based standardization would be coordinated and distributed.[43] Countless voices and other temporal notions remain neglected in the account below, which is limited to how a particular version of standardized time has been universalized by law and made operable the world over. The historical account reveals particular interests advantaged by market-oriented transactional possibilities, which have their counterpart in other interests that have lost out or been excluded. The interests of workers who protested the new time imposed in the mills outside Bombay are an example of the latter. Many of the interests that lost out, however, are present below not in form of contest, but silence.[44]

The story here provisionally begins with telegraphs, railroads and observatories.[45] Telegraphs had given rise to a fantasy of global simultaneity, and provided crucial technological means by which to distribute over distances time signals derived from astronomical observatories – Madras, in this case – allowing railroads to keep a reliably consistent time across great lengths of track and distinct networks.[46] These three things, observatory, telegraph and railroad, set the foundation for new patterns of transnational order and interconnection, in which networks of private industry interlinked with scientific associations and interacted with various government and legal offices. The objective was to organize relations according to rationalized, abstract time standards, like seconds and minutes, consistent across (and employed to define) space, within India, but also globally. To do this, these networks overcame the resistance of local standards for time, along with local temporal-cultural identities. The point, however, was not a contest for time itself, but an effort to achieve two discrete goals that will repeatedly return in what follows: first, to organize the movement of people, goods and services in a rationalized and uniform way – this was the primary concern of the railroads and local and international commerce; second, to facilitate the communication of certain scientific interests in the service of imperial imagination and self-regard – this was a primary concern of gentlemen clubs of amateur astronomers, active in the story below.

[43] For a critical philosophical look at some other sorts of temporal contest in India over the same time period, see Kapalgam, 'Temporalities, History and Routines of Rule in Colonial India', 8 *Time & Society* (1999) 141.

[44] There is work being done to recover those voices and interests, and more to do. See, e.g., Rifkin, *supra* note 28.

[45] Krishnan, *supra* note 42, at 37–46.

[46] P. Galison, *Einstein's Clocks and Poincaré's Maps: Empires of Time* (2003).

A *Railroad Time*

In the middle of the 19th century, railroads were seen as crucial to the so-called civilizing project with which European imperial powers covered themselves. As reported by Ritika Prasad, British officials in India viewed railroads as a 'mighty engine of improvement', which would 'cause the slumbering spirit of India to awake from the sleep of ages, the sleep of apathy, superstition, and prejudice'.[47] Railways, of course, were not merely viewed as engines of improvement, but also engines of capital, which fuelled their growth, as they in turn fuelled the growth of capital.[48] With the support of colonial administrators, the growth of railroads in colonial India was explosive. As it grew, the railway industry, together with the imperial civilizing ideology to which it was joined, became increasingly invested in standardized time. By 1862, the year the mean time used in Madras was adopted as a uniform time for all telegraph operations in colonial India, the East India Railway was also militating for a uniform mean time to be kept on railway networks across India. The colonial government approvingly associated a uniform mean time for railways with the interests and influence of businessmen, but demurred, and, unlike for telegraph operations, did not approve a uniform mean time for railway operations, on the basis of problems the regional publics might pose to its implementation. The colonial government resolved instead in favour of regional standardization according to select local mean times (it bears noting that because the different regions were defined according to their four colonial administrative units – the Presidencies – the conflict between regional and national times involved colonial governance at both ends).

But the terms of the contest as waged between the East India Railway and the colonial government soon switched. Adopting the arguments formerly deployed by the railroads, the colonial government by 1865 was arguing for regional mean times on the basis of business interests associated with the main urban centres, such as Calcutta (now Kolkata) and Bombay, in the different regions or Presidencies. The East India Railway, by contrast, had also changed tactics and waged its arguments for uniform time on the basis of security and passenger safety. In 1867, Bengal's Deputy Consulting Engineer for the railways endorsed the East India Railway's initiative to adopt Madras mean time, likening it to the use of 'London' time in England. The Lieutenant-Governor, however, countermanded the decision, finding the adoption of a 'foreign' time inimical to local public interest. Accordingly, the Bengal government decided against Madras time.[49] In part, the government's position reflected prejudiced colonial perceptions about regional identities and assumptions about (lack of) capacity for rationalized techniques of time measurement. But in part, the position at the time of British India's colonial government was also due to a sense that the balance

[47] Prasad, '"Time-Sense": Railways and Temporality in Colonial India', 47 *Modern Asian Studies* (2013) 1252, at 1254.

[48] R. Prasad, *Tracks of Change* (2016) at 20; MacPherson, 'Investment in Indian Railways, 1845–1875', 8 *The Economic History Review* (1955) 177; Thorner, 'Great Britain and the Development of India's Railways', 11 *Journal of Economic History* (1951) 389.

[49] Prasad, *supra* note 47, at 1259–1261.

of business interests resided separately in the regional urban(izing) centres. In sum, the policies of the colonial government exhibited a mix of expedience, prejudice and business interests, whereas the railways exhibited a more discrete purpose and goal, argued strategically by changing reference to business and security.

By 1870, however, the railways had partially succeeded for their immediate purposes, and Madras time was used on the rail networks.[50] Because Madras time was not otherwise mandated for other civil purposes, it became known also as railway time. Even in that limited capacity, discontent was almost instantaneous. Shekhar Krishnan reports that within a month of the adoption of railway time, 'F.C. Hope, the Collector and Magistrate of Surat, a major trading port and manufacturing centre north of Bombay City, "received representations from various quarters regarding the extreme inconvenience to the people caused by the adoption of Madras time on the Bombay Baroda and Central India Railway"', moving Hope likewise to voice his own misgivings.[51] Conflicts over standardization persisted on several fronts: international; administrative or regional; and local. Internationally, pressure was applied to coordinate railway time to the so-called universal standard represented by the Greenwich Meridian, as opposed to the locally-derived referent represented by Madras mean time. Regionally, as a matter of administration among the Presidencies, Calcutta, Bombay and Karachi were still operating largely according to their own mean times. Locally, the time in use by railways was not necessarily adopted for other purposes.[52]

B *Administrative Overreach*

In 1881, James Fergusson, Governor of Bombay, missed a train – by some accounts two[53] – ostensibly due to the plethora of competing times and timetables in use between his office and the railway station. This apparently led to something of a crusade to unify the times in use in Bombay. Accordingly, in November of that year, Fergusson announced that Madras time would be kept for all municipal and official purposes in the whole of Bombay from that December forward. Bombay newspapers, however, immediately and consistently voiced disapproval of the change, including attacks on the governor, the government, and the use of government power.[54] Resistance was widespread: a time ball and gun at Bombay Castle, marking time visually and audibly, kept Bombay time. The cathedral clock in the city changed time, but its bells rang on the old schedule. Prominent clocks throughout the city, including the Hormasjee Wadia Clock Tower and the Arthur Crawford Market clock maintained Bombay time. Courts were engaged in the conflict. In Karachi, concern was raised for the effect of Madras time upon questions of jurisdiction and evidentiary showings. In Bombay

[50] *Ibid.*, at 1264.

[51] Krishnan, *supra* note 42, at 48.

[52] Prasad, *supra* note 47, at 1264–1265; Krishnan, *supra* note 42, at 49–50.

[53] As reported by Masselos, 'Bombay Time', in M. Kosambi (ed.), *Intersections: Socio-Cultural Trends in Maharashtra* (2000) at 165, citing the *Bombay Gazette* of 2 November 1881.

[54] *Ibid.*, at 165–166.

City, the high court refused to implement Madras time, on the basis that it was not subject to directives from the Governor.[55]

In 1882, the fight over time standards and their control came to a head around the newest and most spectacular clock in Bombay, in the university's Rajabai clock tower. The tower was endowed in 1869 by Premchand Roychand, and named for his mother, Rajabai. Roychand, a broker, came to prominence with the boom in cotton shares during the American Civil War. He commissioned Sir George Gilbert Scott, designer of St. Pancras Station and Albert Memorial in London, for the tower's gothic design. Construction was completed, though still without a clock, in 1878. The clock was purchased and shipped from England, and finally installed in 1882. The university, however, sought extra funding to light the clock's four faces at night. The Town Council, part of the Municipal Corporation, offered to split costs with the government, but on the condition that the clock would keep Bombay time. Insisting on Madras time, Governor Fergusson refused to split the costs.[56] Instead, Fergusson offered on behalf of the government to pay the entire cost of lighting the clock at night, again on condition that the clock would keep Madras time, which it did until the following year, 1883. In that year, the university Senate, at the initiative of the Bombay Chamber of Commerce, held a referendum on the time kept by the university clock. Bombay time carried the vote. Fergusson and the government stopped all payment for the clock.

On other fronts, however, Fergusson and the municipality relented. The Chamber of Commerce in 1883 made capitulation palatable by appealing to the government in deferential terms to revert to Bombay time. Fergusson and the government acceded, attributing the switch to Madras time to pressure from the Chamber of Commerce, and restoring Bombay time for official and municipal purposes. The restoration, however, only took official effect in the city and on the island of Bombay, leaving Madras time in effect for government purposes throughout the rest of the presidency on the basis of interests expressed by the Postmaster General and the Commander-in-Chief of the military. Beyond the city and island of Bombay, only in Karachi was local time officially restored, and once again only after appeal by the Chamber of Commerce, this time Karachi's.[57]

Over the next decade or two, local times remained in abundance and were even legally sanctioned throughout India, but pressure mounted in favour of standardized time from new actors and offices, also active in the story of globally standardized time in other locales. These other actors, in keeping with the push for globally standardized time occurring outside colonized India, were aligned with international interests, including connection with other railway interests abroad, and international networks of gentlemen scientists celebrating scientific rationalism and the promise of progress. In that context, Cleveland Abbe, head of meteorological services for the US Army Signal Unit (and thereafter known as 'the father of meteorology') had prepared in 1879 an ambitious Report on Standardized Time, in his capacity as Chairman of a

[55] Krishnan, *supra* note 42, at 53–54, 70–77; and Masselos, *supra* note 53, at 170–174.

[56] *Ibid.*

[57] Krishnan, *supra* note 42 at 103–104; Masselos, *supra* note 53, at 172–174.

new Committee on Standard Time for the American Meteorological Society. Abbe had already been in correspondence about standardizing time with Sanford Fleming, chief engineer of the Canadian Pacific Railway, and founder of the Royal Canadian Institute, a scientific society in Toronto. Fleming, also in legend motivated – like Fergusson – by a missed train connection, had begun to address international scientific associations about implementing globally standardized time, and distributed Abbe's report among these associations as well as government offices internationally.[58]

C *Scientific Interventions*

Just as Fergusson and the government in Bombay were making their retreat, Abbe and Fleming had marked a portentous victory for globally standardized time under law, with the International Meridian Conference held in Washington, D.C., in 1884. The conference established under international law a standardized time measurement among signatories – a convention they could mobilize against domestic resistance – and divided the world into time zones, all keyed to the meridian at Greenwich in the UK, now formalized as the global Prime Meridian. India was represented as a British colony by Sir Richard Strachey, though he had left India for England in 1870. Strachey was a former employee of the British East India Company and officer in the British Indian army; he had also maintained a correspondence with Charles Darwin, and was an ongoing member of the Royal Society, where he was chairman of the Meteorological Council.[59] Strachey, the figure, nicely encapsulates a number of the power centres active in this story: corporate, colonial, military, imperial, scientific, and connected. Strachey's participation, however, did not lead to any immediate change in India's times in conformance with the D.C. conference. Instead, Abbe and Fleming's influential report was later forwarded to the colonial government of India. The Royal Scottish Geographical Society also inveighed in favour of globally standardized time in 1891, doing so in favour of India's calibration to Greenwich.[60] Thus at this stage the competition was no longer to make Madras time apply throughout India, but to replace even Madras time with a meridian time coordinated to Greenwich in England, in keeping with the global scheme enacted by the D.C. conference. The singular authority of the Madras observatory in India, associated with the British colonial programme and inter-regional interests, was superseded by the authority of the observatory at Greenwich.

In 1898, the Royal Scottish Geographical Society again argued in a memorandum to the British Colonial Office for a universal time standard in the colonies, defined by the Greenwich Meridian. In 1897, the Seismological Investigation Committee of the British Association for the Advancement of Science had also argued in a memorandum to the British Colonial Office in favour of the same. The Royal Geographical Society of

[58] Bartky, 'Inventing, Introducing and Objecting to Standard Time', 28 *Vistas in Astronomy* (1985) 107–108.

[59] Krishnan, *supra* note 42, at 60–61.

[60] Prasad, *supra* note 47, at 1265.

London petitioned the Viceroy for colonial India to adopt standard time coordinated to Greenwich in 1899.[61] The Royal Scottish Geographical Society's later memorandum went so far as to buttress its argument for universal time according to Greenwich with an appeal to the pride of an imperial power and the demeaning rhetoric of relative levels of civilization. As reported by Ogle, achieving the imperial mission in the form of globally standardized time meant 'the abolition of [a] barbarous arrangement, unworthy of a country pretending to civilization, by which every place keeps its own time'.[62] One consequence of these memoranda was an inquiry by the British General Post Office into extending Greenwich Mean Time not to India, however, but to Ireland.[63]

Meanwhile, the conflicts between local mean time and standardization at other levels also persisted. Prasad has shown that in 1904 'the General Manager of the Darjeeling Railway could be found complaining of the confusion caused by there being "railway time and telegraph office time, cutchery [court] time, bazar time and also church time in a small town like Darjeeling"' – even as pressure mounted to convert Indian railway time from Madras mean time to Greenwich, and expand its use.[64] A half-decade earlier, in 1899, R.D. Oldham, a geological surveyor, produced a report, 'On Time in India', under the auspices of The Asiatic Society of Bengal, a society of Europeans interested to 'study scientifically the colonized societies of the Orient'. Oldham's report was an elaborate argument, or lobbying paper, for globally standardized time, indexed to the Meridian at Greenwich, delivered to the British Viceroy in India. The report covered familiar territory, beginning with a lament of barbarous and uncivilized conditions native to India, as reflected by the nature and variety of times kept across the land. From there, in Oldham's report, the civilizing mission and mandate was joined to an argument founded in the exigencies of so-called modernity, in particular business interests and market participation. In this context, his report held standardized time synchronized to Greenwich to be both neutral and inevitable. Neutral for not being identified with any one of the most apparent Indian competitors for a meridian, such as Calcutta, Bombay or Madras, all equally disfavoured by Oldham.

The argument from inevitability was predicated on the constant expansion of networks for the movement of people, goods and communications crossing countless borders and tying India to a global system: 'the Indian railway system must inevitably become linked up, as has already happened to the telegraph system, with the railways of Europe and Western Asia on the one hand, and of the far East on the other'.[65] And for the purpose a British meridian would, by the imperial presumption, be correct. Oldham drove home the significance of India's situation among these expanding networks, and the consequent need for standardized time, by appealing to business and

[61] Masselos, *supra* note 53, at 175.
[62] V. Ogle, *The Global Transformation of Time: 1870–1950* (2015) 105.
[63] *Ibid.*, at 77.
[64] Prasad, *supra* note 47, at 1267.
[65] Oldham, 'On Time in India', *Proceedings of the Asiatic Society of Bengal* (1899) 49.

shipping interests, and the desire for efficiencies in that context, describing a variety of presumptively-joined, hypothetical actors, first among them the 'merchant in his office'. In sum, standardized time was supposed to represent a natural and neutral token of progress, an advance of civilization especially in terms of efficiency, to the benefit of the private merchant in a global market, at once borderless and defined by an imperial centre.[66] Altogether, the episode is indicative of changes among the characters and strategies in the story at this stage: a scientist, in the service of private industry, using the platform of a scientific society to lobby colonial administrators, on the basis of wider market participation organized under empire.

The colonial administrators were not yet convinced. In 1902, the Observatories Committee of the Royal Geographical Society joined the ranks of scientific associations calling for standardized time in India calibrated to Greenwich. In 1903, the British Department of Revenue and Agriculture produced a report listing the variety of local times in use across India. In the same year, the director general of Indian observatories and government meteorologist John Eliot also proposed mean time derived from Greenwich. His argument exhibited language heard elsewhere, proposing 'to bring India into line with the rest of the world, as by far the great majority of civilized countries have adopted international time in one form or other'.[67] In 1904, a report originally produced by the Meteorological Reporter to the Supreme Government of India in Calcutta was circulated to the provincial governments. It called for standardized time defined by Greenwich on the basis that 'every country' had become 'concerned with the time of every other', by virtue of 'universal international transaction', 'rapid and extended communications', and 'almost instantaneous telegraph'. The crux of the matter was again a question of efficiency, illustrated by reference to maritime shipping conducted according to Greenwich time, and a further appeal to Greenwich as the standard of reference for the civilized world.[68]

The government's report had been distributed to railways, together with local and municipal government offices. The latter forwarded it along to local groups of merchants and chambers of commerce, for their review. The Karachi Chamber of Commerce, and Madras Harbour Trust Boards, Trades Association and Chamber of Commerce, among others, all communicated their approval. Most railways also supported the plan. One hold out was The Great Indian Peninsular Railway, which predicated its resistance on the established practices and interests of 'business men of all nationalities' using its services.[69] The Bombay government also did not immediately sign on, apparently out of continued concern about local sentiment – an acknowledgment of the vigour of local resistance. Against that resistance, the logic and interests behind a global imperial time were consistently communicated in terms of business interests and efficiencies; but in some cases resistance to that time *also*

[66] A. Barrows, *The Cosmic Time of Empire: Modern Britain and World Literature* (2010) at 189–190.
[67] Ogle, *supra* note 62, at 107.
[68] *Ibid.*, at 107; Krishnan, *supra* note 42, at 66.
[69] Ogle, *supra* note 62, at 107–108; and Prasad, *supra* note 47, at 1266.

appealed to business imperatives, purporting to support the established practices of local merchants. W.D. Sheppard, the Municipal Commissioner in Bombay, wrote at the time of a tense division in the matter between traders associated with the bazaars and traders associated with European markets.[70] The division anticipates further divisions that will be apparent below, suggesting, among other things, a contest to control a single governance technology for application in emerging markets.

D *India Standard Time*

By 1905, the imperial government finally achieved a lasting, if partial success: a uniform time, five hours and 30 minutes ahead of Greenwich, was officially adopted for all Indian railways and telegraphs – though with local and regional departments retaining final authority over time standards for all other purposes. It was left to the Public Works Department to introduce so-called India Standard Time (a name calculated to mollify nationalist sentiment), indexed to the Greenwich Meridian, with the additional goal of applying ultimately to all of India for all civil purposes. The colonial government of Bombay pressed forward to do so, with the support of a variety of private groups, including the Bombay Presidency Trades Association, the Bombay Association of Fire Insurance Agents, the Native Share Broker's Association, and the Mill-Owners' Association.[71] The Bombay Chamber of Commerce initially voted against the adoption of India Standard Time, but reversed its vote in short order. Thereafter, the Bombay Municipal Corporation, the city's self-governing institution, also came out in support of India Standard Time, adopting it for all municipal purposes as of January 1906. The outcry against India Standard Time in Bombay, however, was immediate and severe. The *Kaiser-i-Hind* newspaper lamented 'artificial time' devised by the Astronomer Royal, and suggested that India Standard Time was perpetrated to further the particular interests of 'a few hundred globe-trotters and exalted officials'.[72] Other newspapers communicated continued reliance on solar time.

Though the railroads had not ostensibly been at the public forefront of policy debates, they continued to be associated with the push for standardized time, as reflected by editorials in the *Bombay Gazette* blaming the 'selfish thoughtlessness' of the railways and lamenting the privilege of a few railway travellers.[73] The confrontation escalated. Factory workers, especially in the cotton mills, began protesting the new time regime. They went on strike over the new time dispensation and protested en masse, throwing rocks at factory buildings and destroying the grand clock at the Sassoon Mill, one of the largest mills outside Bombay, on the first day of its change to India Standard Time (and despite a change in working hours to accommodate the

[70] As reproduced in Krishnan, *supra* note 42, at 79–80.
[71] Masselos, *supra* note 53, at 175–176; Ogle, *supra* note 62, at 110.
[72] Ogle, *supra* note 62, at 112, 115.
[73] Masselos, *supra* note 53, at 176.

shift).[74] The conflict at the Sassoon Mill reflects the interpenetration of globally standardized time and capitalist time discipline seminally described by E.P. Thompson.[75]

The fight in India was carried back to the Bombay Municipal Corporation, where its decision in favour of India Standard Time was thrown in doubt on the basis that normally absent European members showed up in unusual numbers to carry the vote, which was in addition allegedly rushed to suppress dissent. A successful petition obliged the Municipal Corporation to hold a new vote in April 1906. Sir Pherozeshah Mehta, a Parsi political leader and early advocate for Indian self-rule, knighted in 1904, but also known as the 'father of municipal government in Bombay', spoke powerfully in favour of returning to Bombay time. Mehta had been a founding member and president of the Indian National Congress in 1890, and, among other things, would also become one of the founders of the Central Bank of India, financed by Indian nationals, in 1911, and a founder as well of the *Bombay Chronicle* newspaper in 1913.[76] At the debate before the new vote, he accused the Chamber of Commerce of treating the city's inhabitants like chattel in the matter, holding that the new time regime had been adopted without attending to their concerns. He argued, rather, that 'Standard time never could be adopted in Bombay except by the small colony of Europeans and the natives that go with them.'[77] Mehta carried the vote for Bombay time, 31 to 23. Around the same time, another petition was addressed to the colonial Government of Bombay to repeal Indian Standard Time as a matter of law. This petition was ignored. A demonstration followed against the government at Madhav Baug, in the Indian section of Bombay, organized by Ahmedbhoy Habibhoy, Callianji Amurchand and Manmohandas Ramji, producing another petition. Shekhar Krishnan describes the petition as 'a rich document articulating the dilemmas of nationalist politics and colonial rule at the turn of the century'.[78] Notably, the document also joined the battle with the discourse of science, holding the move to standard time coordinated to Greenwich to be 'against the principles of modern science'.[79] Mehta also joined the scientific discourse, questioning the scientific basis of the turn to a standard time keyed to Greenwich.[80]

Meanwhile, fissures were apparent within the merchant class in Bombay. The Grain Merchants' Association and the Bombay Native Piece Goods Merchants' Association came out against India Standard Time, emphasizing their voices as representative of native Indian trading and mercantile classes. As Ogle reports, the contest over

[74] Krishnan, *supra* note 42, at 92; Ogle, *supra* note 62, at 108–115. In addition, the Sassoon Mill conflict anticipated later ones. Wolcott, 'Strikes in Colonial India, 1921–1938', 61 *ILR Review* (2008) 460. My thanks to Ntina Tzouvala for the reference.

[75] Thompson, 'Time, Work-Discipline, and Industrial Capitalism', 38 *Past and Present* (1967) 56.

[76] 'Sir Pherozeshah Mehta', *Encyclopædia Britannica, Encyclopædia Britannica Online. Available at* https://www.britannica.com/biography/Pherozeshah-Mehta.

[77] Ogle, *supra* note 62, at 111.

[78] Krishnan, *supra* note 42, at 86.

[79] C. Amurchand, A. Habibhoy and M. Ramji, *Public Petition Against India Standard Time* (1905), reproduced in Krishnan, *supra* note 42, at 275.

[80] Masselos, *supra* note 53, at 179–180.

time became still more entwined with different political causes and figures.[81] As Jim Masselos indicates, class and race were both factors.[82] In a related context, Mawani has argued that '[s]ubjection and subjectivity … are inscribed in and work through competing racial temporalities',[83] applicable here as the colonial government sided with European mercantile interests, which were consistently opposed by native Indian communities, though in differentiated groups. Through it all, different markets and different market interests can be discerned in the competing factions. Commodities, credit and money markets with differential impacts on local, regional and international trading practices were all raised in the dispute.[84] Merchants in the bazaar vied for control over time with their competitors engaged in international trade networks, while workers for the international merchants opposed the time interests of the owners and the managers closer to them. The political scene showed related divisions. Masselos and Krishnan both suggest that Mehta and others of his generation moved to represent Bombay interests as a manoeuvre to maintain local authority ahead of a more revolutionary generation of political activists, represented by figures such as Bal Gangadhar Tilak. Workers from outside the cities had protested with strikes and in confrontations at the mills, while a middle class working in urban Bombay's businesses and bureaucracy had gathered at Madhav Baug.[85]

Throughout, the colonial government was consistently accused of intriguing against the local population. The British Viceroy, Lord Nathaniel Curzon, represented a singular object of Indian discontent across the various factions, Curzon embodying also the wider political and governance discourses with which the contest over time under law had become entwined. In 1904, Curzon had asserted greater imperial control over higher education in India. In 1905 he announced the first partition of Bengal, splitting off parts of the large administrative department. Previously, in response to an outbreak of plague, public health measures imposed under Curzon were intrusively and unevenly applied. All three actions were deeply unpopular among Indian nationals, and resisted as aggressive acts of colonial overreach.[86] Newspapers and public figures suspected Curzon behind the local measures to adopt India Standard Time, and questioned the insistence on standardized time defined by Greenwich, while Bombay itself was the site of colonial division and official inconsistency. The conflict persisted for years. For three consecutive years, in 1927, 1928 and 1929, the Bombay Municipal Corporation took votes on the governing time regime, with the intention of adopting India Standard Time. In each case, the vote failed. The situation came to be called the 'Battle of Clocks'. By the 1930s, however, the battle had turned, with official institutions in the city generally keeping India Standard Time, and the Municipal

[81] Ogle, *supra* note 62, at 113.
[82] Masselos, *supra* note 53, at 178–179.
[83] Mawani, *supra* note 7, at 65.
[84] Krishnan, *supra* note 42, at 82–83.
[85] Masselos, *supra* note 53, at 177–178.
[86] Krishnan, *supra* note 42, at 102–103.

Corporation becoming the lone holdout. Still, it was only in 1950 that the Municipal Corporation finally acceded, changing its clocks to India Standard Time.[87]

5 Conclusions

Let me review in brief the group of characters above. Following the railroads, the group includes military figures and scientific associations, colonial offices and other governmental agencies, together with local and international commercial associations interacting in complementary but loosely organized ways. Those interactions featured appeals to an imperial project mixed up with an ideological sense of identity founded on scientific rationalism, alongside appeals to administrative and market-oriented efficiency. Empire, military interest, science and bureaucratic administration all combined with economic rationality to achieve globally standardized time. That rationality was sometimes mobilized in competing ways: the Presidencies exhibited one sense of bureaucratic exigency in this context, the British Colonial Office another. But consistently coupled to this rationality was what Antony Anghie has called the dynamic of difference,[88] and what Sundhya Pahuja has referred to as the circular self-constitution of self and other,[89] deployed to legitimize the imperial project.

The dynamic of difference meant a status apart for the colonized peoples, a remedial condition justifying imperial aggression in the name of the civilizing mission. The civilizing mission is associated in the present story with the failure ascribed to colonized peoples to grasp and appreciate the universal boon of rationalized, abstract time. Likewise, the circular self-constitution of self and other plays out in the way imperial self-perception was contingent on the construction of the barbarous other, as is clear in the strategy of the Royal Society memos, which linked the appeal to imperial pride with the denigration of barbarous conditions in the colony. In this way the scientific interest in globally standardized time served to affirm the ideology of western progress that supported the colonial project of international law. It bears noting, however, that even the dynamic of difference and civilizing mission were sometimes mobilized in conflicting ways. For the British Colonial Office, the discrepancy in so-called standards of civilization was reason to press forward with globally standardized time; for the Presidencies, the perceived discrepancy was reason to proceed slowly.

On the one hand, the construction of standardized time was hardly coordinated, but on the other, a constant return to rationales predicated on the interests of market participants and the ability to move goods consistently comes through the chaotic story of actors and incidents. As Ogle has pointed out, the ends of

[87] *Ibid.*, at 113–18.

[88] A. Anghie, *Imperialism, Sovereignty and the Making of International Law* (2004); and Anghie, 'The Evolution of International Law: Colonial and Postcolonial Realities', 27 *Third World Quarterly* (2006) 742.

[89] S. Pahuja, *Decolonising International Law: Development, Economic Growth and the Politics of Universality* (2011) 28; and Pahuja, 'The Postcoloniality of International Law', 46 *Harvard International Law Journal* (2005) 459, at 460–461.

commerce and commodification were always taken as ends for the project of globally standardized time:

> [U]niversal and uniform time, hailed as a lubricant for a highly interconnected world, was to permit the seamless flow of people, goods, and ideas. Like uniform weights and measures based on the decimal system and standardized rates for mailing letters and sending telegrams, uniform time would establish commensurability and comparability and allow for commodification and exchange.[90]

The imperial language of relative civilization also played a decisive part. Its proponents celebrated and leveraged the abstractions of standardized time as tokens of western civilization, scientific possibility and progress (despite the struggles, documented elsewhere, of legislators in Europe and the United States in fact to comprehend this token of abstract, rational thought).[91] These ideological supports at once enabled both the legal and temporal rationalizations of empire, and with them the development and flourishing of transactionally-linked global networks. Within the imperial framework, characterized by expanding industrial capitalist competition, the ability to set expectations with precision across unprecedented distances enabled economic practices reaching across more and more borders and spaces. The combination of time and law in this context contributed to emerging transnational networks, formed out of legal and normative bases disembedded from local conditions,[92] establishing conditions of possibility for what today are called global value chains. Colonial governance mediated the tensions that arose in the process between imperial or transnational networks and local conditions, at times observing the latter but always with the institutional aim of serving the former.

The story here makes clearer some ascendant powers in this governance context, and the values they represented. Railways, militaries, merchant communities and scientific clubs, together with the technologies with which they interacted, played a special role, disseminating standardized time as part of an imperial project legitimated according to an ideology of western modernity and progress narratives operating in service of market interests. Focusing especially on the interaction of imperial ideologies and technologies, David Arnold writes:

> it was precisely one of the self-legitimizing mechanisms of colonial regimes and many of their postcolonial successors to make a distinction between indigenous technologies … that were condemned as being primitive, wasteful or environmentally destructive and those … that were validated by modern science and sanctioned by the imperatives of productivity and profitability.[93]

Arnold's language underscores the relationship between the technology of globally standardized time, modes of production and means of profit. As noted

[90] Ogle, *supra* note 62, at 22.

[91] Ogle, 'Whose Time Is It? The Pluralization of Time and the Global Condition, 1870s–1940s', 118 *The American Historical Review* (2013) 1376, at 1382–1383.

[92] The idea of disembeddedness is drawn from K. Polanyi, *The Great Transformation* (1944).

[93] Arnold, 'Europe, Technology and Colonialism in the 20th Century', 21 *History and Technology* (2005) 85, at 96.

earlier, standardized time carries forward the capitalist programme of time discipline. Extended around the world, standardized time discipline enabled networks to link production centres with transportation lines and distribution hubs around the world. That programme and those networks historically serve some interests and harms others. A quick look back through the account – from the actions at the Sassoon Mill, to the protests at Madhav Baug, to the machinations in the Municipal Corporation – will underscore divisions in the struggle to dominate standardized time and its distributive effects. Divisions of class and race are prominent elements of an account dominated by men, in an imperial and ideological history characterized by the so-called standards of civilization.

In sum, the history offered here illustrates how particular groups have competed to dominate the infrastructural development of globally standardized time under law internationally, in pursuit of particular purposes. Against that backdrop, let me refer again in closing to the contemporary inquiries raised in section 2, to which the events told above remain relevant. Contemporary concerns include the ways that interactions of time and law have defined baseline norms of international law-making and legal practice. As Thomas Schultz puts it, the interaction of globally standardized time and international law pertains to 'struggles over the legitimate understanding of what deserves the label of international law'.[94] Schultz offers an image of would-be party goers:

> think metaphorically of norms standing in a queue waiting with bated breath to be let into the club of international law; bouncers let some in, some not, based on criteria they call 'rules of recognition' or just 'sources'; every now and then, the bouncers are given new instructions; every now and then, the shift of bouncers is relieved. Like a con planning a heist, the question … is to determine the likely 'nows and thens'.'[95]

Sally Engle Merry conveys the point from the perspective of global legal pluralism: 'The analysis of global legal pluralism requires attention to time: to the development of new normative regimes and legal institutions … [because] a sociologically and culturally sophisticated version of global legal pluralism that incorporates a temporal dimension promises to provide an effective analytic framework for understanding international law.'[96] Likewise, the legal-temporal dimensions investigated in section 4 shed light on colonial governance techniques at work under international law to stabilize expectations for transactional purposes across plural legal environments globally. In that context, international law encodes and is encoded with a dominant but particular temporal framework. Despite particularity, however, the two together are presumed to do universal work. That universality, insofar as it is different from ubiquity, is a fiction, both as a matter of time and law. The fiction is not a neutral one. It has operated to harm indigenous communities, among others. For this and other reasons, Fleur Johns concludes with a call to 'reactivate' competing times 'as political questions

[94] Schultz, *supra* note 10, at 2.

[95] *Ibid.*, at 3.

[96] Merry, 'Global Legal Pluralism and the Temporality of Soft Law', 46 *The Journal of Legal Pluralism and Unofficial Law* (2014) 120.

of the first order'.[97] To do precisely that, Mark Rifkin's work 'takes inspiration from the role of relativity within physics in challenging the commonsensical conception of time as neutral, universal, and inherently shared.'[98] Drawing also on basic insights of special relativity, the account here has examined aspects of the political contest embedded in the inter-relationship between transnational law, including international, and globally standardized time, to provincialize the particularity of their co-production, and challenge the tendency to take for granted their ongoing interaction and its consequences.

The interest of contemporary legal scholars in fundamental dimensions of the time-law interaction reflects a present conjuncture in which time technologies operating near the speed of light underlie internationally destabilizing developments such as high-speed financial transactions, autonomous weapons systems, blockchains, data mining and more. From this perspective, the historical investigation in section 4 helps to problematize assumptions of a universal accomplishment exhibiting a rational, linear character in the interaction of transnational law and standardized time. Doing so further corresponds with and expands on James Angel's call in section 2 to revisit our intuitions of time and law, his concerns raised specifically in the area of financial regulation. It corresponds as well with Gregory Messenger's broader concern to revisit perceptions of time at the root of international law-making and legal practices.[99] False intuitions and perceptions, however, or perhaps just false assumptions, do not mean arbitrary outcomes. As noted by Keebet von Benda-Beckmann, 'the competence to navigate the complex web of temporalities and legal orders is highly unequally distributed'.[100] Currently there are only a select few global actors capable of deploying the expertise and resources, computational and infrastructural, necessary to negotiate temporalities and legal orders to their advantage internationally. The work they have been able to achieve on that basis includes infrastructural development of networks disembedded from local normative constraints but capable of stabilizing expectations transnationally in the movement of goods, capital and information. And this brings me back in conclusion to the point raised earlier: globally standardized time is built, in a co-productive relationship with transnational law. The question was: What is it built for? The account here reflects a partial, historically-grounded answer, demonstrating interests embedded in its foundations. Johns emphasizes the urgency of further confrontation with the question: 'The base times of the nation-state and the global economy may be invisible, but the tolls that they sometimes exact do not go undetected. Everywhere one looks, the "proud, angry poor" are voicing and enacting dissatisfaction.'[101] Further investigation in this light might include the governance

[97] Johns, *supra* note 13, at 59–60.

[98] Rifkin, *supra* note 28, at ix.

[99] Messenger, *supra* note 14. I examine a similar nexus from a different perspective in Gordon, 'The Pace of Law (in a Transnational Time)', in L. Boer and S. Stolk (eds), *Illuminating the Backstage of Transnational Law* (2019, forthcoming).

[100] Von Benda-Beckmann, *supra* note 17, at 2.

[101] Johns, *supra* note 13, at 59.

effects and infrastructural architecture of time stamps, together with the algorithms and differently-resourced national laboratories and atomic clocks relied on by the Bureau des Poids et Mesures to produce International Atomic Time (and thus UTC) on a month-to-month basis. The conflict between China and the United States at the UN's ITU-R over the status of the leap second represents an active controversy worth greater attention. Likewise the implications of global security systems active at and across borders, including the surveillance apparatuses, drones and automated weapons, which process, map and communicate threats on the basis of time technologies.

Rosalyn Higgins, as noted in section 2, closed her inquiry with a quotation from Eliot, drawing on work at once nostalgic and critical. Against the array of issues raised since then, let me close with another famous line from a work that differently scrambles the technology, directionality and politics of time and law: 'Have no fear for atomic energy, 'cause none of them can stop the time.'[102]

[102] B. Marley, *Redemption Song* (1980).