"The Waste of Daylight"
Rhythmicity, Workers' Health and Britain's Edwardian Daylight Saving Time Bills
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Published in:
Social History of Medicine

DOI:
10.1093/shm/hkab105

Publication date:
2022

Document version
Publisher's PDF, also known as Version of record

Document license:
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Citation for published version (APA):
Summary. This article explores an interesting episode in the history of time, health, and modernity: Britain’s 1908 and 1909 Daylight Saving Time (DST) Bills. While the original DST scheme was unsuccessful, the discussions surrounding its implementation reveal tensions central to early twentieth century modernity, namely between industrial time and ‘natural’ bodily rhythms. This article argues that DST was essentially a public health measure aimed at improving the conditions of indoor workers like shop girls and clerks through government regulation of the private time of the labouring classes. Drawing on the extensive evidence provided to two House of Commons Special Committees, this article reveals how DST debates drew together contemporary discussions around sunlight therapy, night work, and the importance of regular sleeping and eating to tackle Britain’s endemic urban diseases like consumption and anaemia. I suggest that the idea of bodily rhythms was increasingly important in medical thinking in this period and that the study of rhythmicity points to the potential for incorporating temporality as an analytical category in medical history.

Keywords: Daylight Saving Time; sleep; occupational health; rhythmicity; labour movement

In 1894, T. Thatcher published his pamphlet ‘Health and High Pressure in Business’ in response to a nation-wide conversation about the compulsory early closing of shops. Since the 1840s, the Early Closing Movement had advocated for restricted opening hours of shops as a way to combat the overwork of employees. A shop assistant himself, Thatcher was suspicious of the ill health that workers supposedly experienced in what he sarcastically called, ‘that human slaughter-house—the retail shop’. ‘Shop-assistants undoubtedly require as much time as possible for healthful relaxation and exercise—the occupation is nerve-exhausting, and demands that recreation which is not of a nerve-exhausting character’. However, the solution to the notorious sickness rates amongst retail workers was not the curtailing of shop hours, Thatcher suggested, but instead the

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practice of ‘early-rising’, to which the author attributed his own robust health. ‘Nature is at its best in the morning hours; the air is the purest, and no time is so eminently adapted for healthful, physical, and mental recreation.’

Thatcher was not alone in his belief in the health-giving properties of an early morning start. For centuries, early rising had formed a core part of a Protestant self-discipline based on thrift and moderation—especially of time. As social theorist Max Weber remarked of modern life, ‘to waste time is thus the first, and in principle, the worst of all sins’. Writing in 1908, English novelist Arnold Bennett observed that many people were inefficiently squandering their precious daily allocation of time on frivolous pursuits like novel reading, half-hearted working, and needless sleeping. In the first decade of the twentieth century, this interest in time, and the waste of it, culminated in the proposal of a state-sanctioned annual Daylight Saving Time (DST) by British builder William Willett (1856–1915).

Willett’s scheme found wide support amongst politicians and industrialists, and between February 1908 and August 1909, two House of Commons Special Committees were appointed to consider the national institution of DST. The implementation of an annual hour change of the clock during the summer months aimed to tackle what Willett called the ‘Waste of Daylight’ by promoting earlier rising amongst the working classes, while at the same time providing an additional hour of evening sunshine for rational recreation and self-improvement. In short, DST was a wide-reaching state intervention to structure and optimize the nation’s time.

Despite the efforts of Willett’s many supporters, both bills were ultimately defeated. Indeed, DST was not introduced in Britain until 1916, when it finally won sufficient support as a wartime measure—allowing for savings on electricity and more daylight hours for ammunition production. Perhaps because it was these arguments that won the day, DST has traditionally been associated with the needs of industry. However, in this article, I would like to argue that there is much more to be gleaned from this episode in history, particularly from the perspective of the social history of medicine—namely, the ability of DST to speak to a number of essential tensions around the body, time and health that accompanied modernity. The debates surrounding the bills reveal the growing prominence of the individual and questions around the role of the state in the rights and health of these actors. As historians of time Vanessa Ogle and Jarrett Rudy have observed, the temporal disruption proposed by DST, and the significant public debate which surrounded the movement, has the power to speak to wider socio-cultural anxieties about competing time regimes in the early twentieth century.

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3Ibid., 3.
4A. Roger Eikirch, ‘The Modernization of Western Sleep: or, Does Insomnia have a History?’, Past and Present, 2015, 226, 49–92.
6Arnold Bennett, How To Live on Twenty-Four Hours A Day (Project Gutenberg: 2000 [1908]).
8Ibid.
9Willett passed away in 1915, just one year before DST was finally made law.
might productively view DST as a state-sanctioned preventative health scheme aimed at service workers, especially shop girls and clerks, who had been overlooked by other labour legislation of the period.

The unique temporal element of the scheme also raises critical questions about the status of temporality in the early twentieth century, particularly in relation to keeping well and avoiding disease in a modern world which was increasingly disconnected from the solar time environment. The introduction of standard time in the late nineteenth century had consolidated a proliferation of local solar times to a nation-wide median time set by the Royal Observatory at Greenwich. An annual summer time change seemed to threaten this hard-won standardization. What bodily changes might result from a further departure from 'natural' solar time? What difference could an hour time change make to health? What effect might such a shift have on sleep and on mealtimes? The disciplining of body time to match industrial clock time in the early twentieth century prompted a divergence between public and private time, which had wide-reaching impacts on medicine and society. At the same time, international debates around the practices of shift work and night work provoked similar questions about labour, timing, society and the limits of the human body. In proposing to further uncouple the time environment from the natural rhythms of nature, Daylight Saving Time seemed to further the incursion of modified, industrial and capitalist time into personal, private and embodied time.

Drawing on a much older, moralizing discourse around the spiritual and somatic benefits of early rising, early twentieth century DST supporters, particularly medical professionals, provided a social and medical basis for disciplining workers’ bodies into making more productive use of the early morning hours. The training of the productive body was at the heart of the modern capitalist project, and historians of the modern body like Anson Rabinbach, Stephen Kern and Steffan Blayney have explored how temporal modernity intersected with physiology through the creation of the notion of ‘industrial fatigue’. ‘Fatigue’ refigured tiredness as a problem to be solved with the tools of medical science. The increasing speed and interconnectedness of urban life in the late nineteenth and early twentieth centuries was also linked to the emergence of uniquely ‘modern’ pathologies from neurasthenia to railway spine. From steam power to telegraphs, many contemporary commentators felt themselves at the center of a compression of time and space.
space. Building on this interest in modern temporalities and health, this article proposes DST as a case study that speaks to broader turn-of-the-century socio-medical concerns around workers’ health, physical degeneration and the centrality of rhythmicity to physical wellbeing. While explicitly medical testimony only made up a small proportion of evidence presented to the Special Committees, I contend that health, through the direct and preventative benefits of an additional hour of daylight, were at the heart of the scheme’s rationale.

This study of DST in Britain also contributes to an already rich literature on the social history of occupational health in the late nineteenth and early twentieth centuries. Almost 40 years ago, Paul Weindling commented on the surprising lack of interest in occupational health amongst scholarship concerning ‘industry, the labour movement and medicine’. While important contributions in the interim have gone some way to improving this state of affairs, occupational health remains an understudied aspect of medical history. Most scholarship has focused on the so-called ‘dangerous trades’, especially mining and factory work, and their associated specific conditions like asbestosis or grinders’ lung. However, the plight of service workers, whom the DST legislation primarily hoped to benefit, has been largely overlooked. Lacking any specific or easily identifiable cause of ill health, such workers suffered instead from amorphous complaints like exhaustion, gastro-intestinal disease and anaemia brought on by long hours, constant standing and irregular meal times. While late nineteenth century legislation had gone some way to ameliorate the work environment of the factory, in the early twentieth century shop assistants were found to be working on average 80 hours a week—provoking considerable concern from physicians and politicians alike. By introducing state intervention in the time management of these workers, DST can be seen as a part of a broader shift towards preventative medicine by harnessing moral and medical arguments


21Bonea et al., Anxious Times– Chapter 1, ‘The Influence of Employments on Health’: Work and Medical Discourses about Occupational Health’.

22Report from the Select Committee of the House of Lords on Early Closing of Shops, Together with the Proceedings of the Committee and Minutes of Evidence (London: Printed for His Majesty’s Stationary Office by Wyman and Sons, 1901).
for the practices of early-rising and rational recreation, and the healing power of sunlight.

Today, the possible negative health impacts of repeated time changes on our circadian rhythms are at the centre of the current movement to discontinue the practice of DST. Chronobiologists (scientists who study circadian rhythms) argue that the repeated changing of clock time results in a temporary mismatch of internal body time with solar time, or ‘social jet lag’—which results in increased risk of death from cardiovascular events and accidents. While the phrase ‘circadian rhythm’ would not have been familiar to the witnesses at the DST Special Committee hearings, the concept that the body followed natural daily rhythms which could be disrupted by a change of the clocks would not have been surprising. This article will suggest that the DST discussions around sleep, vitality and the timing of work and rest resonate with growing contemporary concerns about rhythmicity and health.

Creating Daylight Saving Time

For many of us today, changing the clocks twice a year has become such a standard practice that it requires very little thought. However, in the early twentieth century the idea of simply ‘changing’ the clock was not only difficult to understand but seemed to fly in the face of the previous 70 years’ worth of efforts to standardize time. The history of timekeeping is long and fascinating but for our purposes, it is only necessary to highlight the difference between ‘solar time’ and ‘mean time’, also referred to as ‘standard time’ or ‘clock time’. Because the earth rotates around the sun on a tilted axis, the length of the day varies considerably depending on the time of year and the latitude of the point measurement. This tilting results in seasonal variations—with the days in the northern part of the Western hemisphere being much longer in the summer and shorter in the winter. It also means that in order to keep time regular, a ‘mean’ or averaging system must be created for noon to occur at the same time every day. While in the early nineteenth century different towns, cities and countries marked their own version of standard, or ‘local’, time, by the end of the nineteenth century, a hard-won agreement at the International Meridian Conference had made Greenwich Mean Time the ‘universal’ time standard. The shift from a temporality embedded in place to a time meant to satisfy the needs of industry has been identified by scholars as a key development of modernity.

However, this standardized mean time did nothing to address the significant annual seasonal changes in light brought about by Britain’s northern latitudes. Short winter days were a challenge for the nation’s industrial economy—with the introduction of artificial sunlight.

lighting in the early nineteenth century going some way to manage the effects of the dramatic seasonal changes in light on productive working hours.²⁸ American statesman Benjamin Franklin (1706–1790) is credited as the first person to suggest an annual clock change as an efficiency measure—although his plan to force Parisians to rise early by the sound of a cannon blast were thankfully unrealised.²⁹ In Britain, William Willett was the first to develop a workable scheme for implementing a seasonal time change which gained widespread traction in industry and serious government interest. In his self-published pamphlet ‘The Waste of Daylight’, he argued that more daylight in the evening meant less expenditure on gas, oil, candles and electricity, which would save over £2 million annually in Britain alone.³⁰ Working by natural sunlight instead of gas or electric light would also reduce the incidence of eyestrain, lessening the ‘need for the services of the oculist and optician’.³¹ Longer bright evenings meant that shop or office workers would have more evening recreation time—enhancing physical health and mental wellbeing. As Willett summarized, ‘While daylight surrounds us, cheerfulness reigns, anxieties press less heavily and courage is bred for the struggle of life’.³²

The simplicity of Willett’s proposal to implement a one-hour ‘summer time’ change belies the passion of campaigners for the bill and the strenuous objections of those against it. The potential disruption to railway timetables, international trade, farming schedules, newspaper production and even the profitability of music halls and theatres plagued the bill’s journey. Nevertheless, the findings of the first Select Committee appointed to investigate the scheme in 1908 were positive. The concluding report highlighted six effects of DST—many of which, by encouraging physical exercise, military training, outdoor recreation and even lessening the consumption of alcohol, tended to support public health:

1. To move the usual hours of work and leisure nearer to sunrise.
2. To promote the greater use of daylight for recreative purposes of all kinds.
3. To lessen the use of licensed houses.
4. To facilitate the training of the Territorial Forces.
5. The benefit the physique, general health and welfare of all classes of the community.
6. To reduce the industrial, commercial and domestic expenditure on artificial light.³³

Despite these positive findings, Prime Minister Herbert Henry Asquith (1852–1928) was not in favour of the scheme and effectively killed the motion.³⁴ Widespread support for the bill brought it to the House floor again only a few months later—but this time the new Committee was much more divided on the merits of DST, and they failed to recommend the initiative by one vote. Willett and his comrades continued undaunted and a third version of the bill was presented in 1911, but was ultimately defeated.

³¹Ibid.
³²Ibid., 7.
³³Edward Sassoon (Chair), *Report and Special Report from the Select Committee of the Daylight Saving Bill, Together with the Proceedings of the Committee Minutes of Evidence and Appendix* (London: Printed for His Majesty’s Stationary Office by Vacher and Sons, 1908), iii.
Throughout these debates, public health arguments were amongst the most compelling in support of the scheme. Willett could boast the support of influential medical professionals—although the merits of more fresh air, exercise and sunshine were apparent to any of the Committee’s lay members. Out of the 63 witnesses called to testify before the Special Committees, only two were specifically medical. However, the relative paucity of medical opinions did not indicate any apathy on the part of the Committee to health matters. Railway managers, newspaper editors, actors, banana importers, astronomers, military men, philanthropists and factory owners all weighed in with their own perspectives on health, sunshine and the potential effects of the bill. Many industrialists were strongly in support of the bill as a measure to insure the health (and the productivity) of their workers. At the same time, certain areas of work like the railways, theatre owners and agriculturalists were strongly opposed to the time change based on the potential harms to their time-dependent industries.

Workers’ Health and Lay Medical Testimony

Willett and the Special Committee members were keenly aware that the proposed clock change would primarily benefit a particular class of labourers, namely, service industry workers like shop assistants and clerks. Dangerous trades like mining, steel working, shipbuilding, weaving and even glassblowing were the subject of Parliamentary inquiries and new regulations aimed at safeguarding life and health in industrial occupations. From phossy jaw to grinders’ lung—physicians, patients and reformers linked the specific hazards of these workplaces to new pathologies. However, less well understood were the vague, generalized effects of ‘round the clock’, indoor working. Symptoms like tiredness, constipation, eyestrain, back pain and anaemia were understood under the umbrella of occupational or industrial ‘fatigue’: an amorphous constellation of complaints which prompted the establishment of the Industrial Fatigue Research Board in 1918. In the years surrounding the DST debates, different iterations of the ‘Shops Closing Early’ Bill struggled to pass through Parliament to address these concerns. The DST Committee testimony provides a unique insight into the industrial health of service employees in this period, whose experiences have often been overlooked in medical history in favour of factory-based workers.

In 1907, the National Amalgamated Union of Shop Assistants estimated that there were over one million shop assistants in Britain. This growing group of individuals was predominantly, but not exclusively, female. Since the early nineteenth century, the shop had gradually become seen as an acceptable place of employment for women, adding to a slowly growing list of occupations like teacher and governess that women might pursue without compromising their social standing. Nevertheless, the ‘physical and moral’ risks of such work for women remained a concern in this period. Long hours, irregular meal times, and insufficient nourishment, as well as intimate contact with customers of both sexes, were perceived to have a deleterious effect on the health of female shop

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35Bonnie Gordon, Phossy Jaw and the French Match Workers: Occupational Health and Women under the Third Republic (New York: Garland, 1989); Harrison, Not only the ‘Dangerous Trades.’
36The Shop Hours Bill was finally passed in 1911.
37Blayney, ‘Industrial Fatigue and the Productive Body’.
39Sanders, Consuming Fantasies, 22.
assistants. With regular work hours generally between 8 a.m. and 6 p.m. (although some shops stayed open as late as 10 p.m. at the weekend)—shop workers were among the groups deemed most likely to gain a direct benefit from more evening daylight.40

A key witness during the DST Committee testimony, Richard Burbidge, the managing director of the famous Harrods department store in London’s West End, estimated that the store employed between 4,000 and 5,000 shop girls, who generally finished work between six and seven the evening. Acknowledging the importance of exercise to their workforce’s well-being, the company had established a special fourteen-acre recreation ground for staff in the London suburb of Barnes, only to find that it was rarely used.41 ‘If they [shop girls] get an hour added to the daylight which they now enjoy, there will be hardly one evening in the week on which they would not get sufficient time to take advantage of the athletic club and ground’.42 Speaking on behalf of Harrods, Burbidge supported the bill on the basis of its ability to improve the health of its female employment base. It is important to bear in mind that the provision of outdoor facilities was not in the service of ‘play’ or ‘amusement’ but a longer tradition of rational recreation—in which physical or intellectual stimulation served to discipline workers’ morality and render them more productive.43

Burbidge was not the only metropolitan employer worried about the health and productivity of this staff. Harry Thomas Holdrom, the director of Brixton’s Bon Marché market, declared that DST ‘would be one of the greatest boons that ever occurred to the workers in shops in London, far exceeding even Lord Avebury’s Shop Hours Act’.44 Holdrom was concerned about the effects of indoor working in London shops like his own: ‘if you look at it from the health point of view, the physique and the health of the girls employed in them, I am sorry to say, is anything but what it should be’.45 For Holdrom the main health risk to shop workers was not necessarily their long hours, but their exposure to the ‘vitiated’ indoor atmosphere of the shop—stemming from a combination of dust and poor quality air.46 Air pollution caused by factory smoke or the domestic burning of coal was directly linked to high levels of anaemia, while dusty, closed conditions were implicated in respiratory diseases.47 In the case of shop assistants, the general poor air quality would have been further compounded by late hours, necessitating work by gaslight after dark. The inevitable result of the burning of gas for light in indoor spaces was a reduction in oxygen caused by fuel combustion.48

Clerks were another class of indoor workers who stood to gain by an hour more sunshine in the evening. Much like shop assistants, the clerical class developed rapidly from the middle of the nineteenth century. As social reformer Charles Kingsley observed, the

40Tomkinson (chairman), Report and Special Report from the Select Committee on the Daylight Saving Bill; Together with the Proceedings of the Committee, Minutes of Evidence and an Appendix (London: Printed for His Majesty’s Stationary Office by Wyman and Sons, 1909), 5.
41Ibid., 176.
42Ibid., 176.
44Sassoon, Report and Special Report, 1908, 57.
45Ibid., 57.
46Ibid., 12.
48Schivelbusch, Disenchanted Night.
clerk ‘is distinctly a creature of the city; as all city influences bear at once on him more than in any class, we see in him at once the best and the worse effects of modern city life’. The figure of the long-suffering clerk became a frequent refrain in the work of novelists like Charles Dickens, most famously the overworked and underappreciated Bob Cratchit in *A Christmas Carol* (1843). Like the largely indoor and sedentary occupation of shop work, clerks similarly suffered from long hours, a lack of breaks and a poor office atmosphere. These sedentary working conditions were believed to make them, as Amelia Bonea and colleagues have observed, ‘particularly prone to diseases of the digestion and circulation’. Joseph John Crosfield, managing director of a soap manufacturer, spoke on behalf of his over 100 clerical staff of the benefits that had been brought by trialling a seasonal time change at his company. For Crosfield, the experiment was a resounding success:

‘I cannot too strongly emphasise the benefit to the health of the staff and the improvement in the work done for the company which has been the result [of seasonal hours]. The business of the company has increased year by year for many years past, and our office staff has remained practically stationary, and I attribute that largely to the better health of the clerks.’

By the time the DST Bills were introduced, numerous other pieces of legislation had tried and failed to improve the condition of indoor workers. For decades, the Shop Assistants’ Association and the Shop Hours Labour League had been fighting against overwork in shops. In 1878, a series of articles in British newspapers highlighted the danger posed to women’s bodies by the necessity for ‘shop girls’ to stand for hours on end behind the counter. Not only was such standing linked to diseases in the legs and pelvis, the need to remain at the counter at all times interfered with regular mealtimes which, Dr Arthur Edis of the Soho Women’s Hospital asserted, had serious long term health consequences. In his *Death and Disease Behind the Counter* (1884), campaigner Thomas Sutherst may just as well have been speaking of the same shop assistants that still worried the DST Committees 30 years later:

‘The rosy cheeks and round full face speedily become pale and emaciated. The features sharpen and the complexion assumes a yellow, unhealthy tinge. The eyes part with their lustre and shew the ominous sinking and darkness. ...the legs swell, the back aches and innumerable internal complaints supervene. Dyspepsia shews itself, the mind and nerves become shaken. The bronchial tubes become clogged, and the blood is speedily poisoned from the continual breathing of air charged with dust and impurity.’

Starting earlier in the morning and allowing for evening exercise were intended mainly as preventative measures—limiting exposure to dangerous indoor atmospheres and

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50 Bonea et al, *Anxious Times*, 42.
53 Lecture at National Health Society on London Shopwomen—Letter to Dr Edis’, *House and Home*, 29 March 1879, 10.
facilitating outdoor exercise and sun which would strengthen the body against disease. By the early twentieth century, the growth of the public health movement had shifted emphasis towards the provision of sanitary environments which avoided the development of disease in the first place. While sunshine as heliotherapy was sometimes also used as a specific treatment for disease in this period, in the case of shop girls and clerks, exercise and sun were essentially prophylactic, strengthening bodies for the fight against illness and tiredness.

Thus far, we have considered ‘expert’ testimony on workers’ health from the point of view of the managers of shops and businesses. As scholars have argued, expertise in industrial fatigue and occupational health was highly contested in the twentieth century. Was it the domain of physiologists, physicians, politicians, industrialists or unions? The promiscuity with which the Special Committees accepted expert advice on health matters from witnesses like shop managers indicates the continued openness of the question and the many sources from which insights into industrial health could come. The DST reports also illustrate a surprising level of compassion for workers’ well-being from the industrialists who testified. A. J. McIvor has argued that prior to the First World War employers did not make a connection between increased productivity and lower hours of work. However here, while the hours were not necessarily shorter, the testimony from people like Crosfield reveal that the Committee witnesses did connect their staff’s health with productivity, or at least lower turnover rates. Regardless of professional background, all these men were convinced that additional hour of sunlight would have a very real positive effect on the physical and mental health of their employees—a testament to the popularity of belief in the preventative powers of rational recreation and sunshine in this period. Nevertheless, for Willett’s scheme to be successful, it was essential that it could recruit support from established members of the medical profession.

Medical Testimony and Physical Degeneration
Initially, the British medical profession was divided as to whether the DST scheme had real potential to affect public health—mainly because they were unsure how a time change would have an impact on people’s daily routines. In 1907, the *Lancet* declared Willett’s plans to be ‘whimsical’: ‘we fear that there is little prospect of the afternoon and evenings being made longer with the hands of the clock’. A year later, the *British Medical Journal* was similarly critical, accusing the bill of ‘tinkering with time’ and pronouncing its medical impacts to be essentially nil—‘it is difficult to see that there is any particular reason why he or she [a shop or office worker] should have daylight leisure in the later afternoon rather than in the morning’. While the major medical journals were sceptical of DST, some practitioners did share Willett’s passion for an early start and evening sun. Willett counted amongst his medical allies royal physician Sir Thomas Barlow (1845–1945), soon to be President of the Royal College of Physicians, and Dr J. Roberson


56McIvor, ‘Employers, the Government, and Industrial Fatigue in Britain’, 730.


Day, a homeopath and Member of the Royal College of Surgeons, both of whom testified at the Committee hearings.

In the initial 1908 hearing, the only purely medical witness consulted was Dr Day, speaking in his capacity as a specialist in the diseases of children at the London Homeopathic Hospital. Day outlined what he perceived as the health hazards of dark evenings for the working classes, especially those ‘staying up in the courts and in crowded tenements, lit by artificial light’. Working late into the night by artificial light was a hazard to eyesight which he observed amongst his patients at the hospital. Day contrasted the potential hazards of artificial light in the home with the health-giving benefits of exposing the body to natural sunlight. Indeed, he observed the proliferation of ‘artificial light baths’ in the clinics of the metropolis to ‘supplement the light that should come from the heavens’. Early rising and exposure to morning sun would remove the need for such medical interventions. Any legislation that encouraged more people to have sunlight during the daytime would result, in Day’s estimation, in ‘less anaemia, less of the rickets and it would tend largely, I maintain, to prevent the deterioration of the race, which is now becoming evident’. Day’s statement was short and to the point, and emphasized his position as an expert in the diseases of children—arguing that the present state of affairs had a greater effect on young Britons than adults: ‘they feel the deprivation of sunshine and fresh air more’, he concluded.

Due to the wide reach of Willett’s charisma and enthusiasm for DST, the great writer and public figure Sir Arthur Conan Doyle (1859–1930) also appeared before the Committee in support of the bill. While Conan Doyle had trained as a physician, his opinions were presented less from the perspective of a medical specialist and more as an interested member of the public. Nevertheless, he too made connections between the scheme and public health. Harkening to Day’s concerns around the degeneration of city children, Conan Doyle asserted, ‘I think the next generation of Britishers would be better for having this extra hour in their childhood. I think the general standard—probably of health and stature—would be perceptibly increased by it’. Conan Doyle also made explicit national anxieties about recent embarrassing losses in the Second Boer War (1899–1902), suggesting that more outdoor evening exercise and rifle drilling would improve the general fitness and military preparedness of the population. His opinions drew on a much longer tradition dating back to the Crimean War in which the ‘new style athletic movement’ was developed to assuage what Peter Bailey described as, ‘the preoccupation with the maintenance of national military preparedness’. The guise of productiveness and service to England’s security helped to develop the Brits into a sports-obsessed nation by the early twentieth century. Conan Doyle was not concerned with the effects of ‘tinkering’ with the clock and argued that the body could adapt to almost any time regime—noting that during his youth he had spent six months on a whaling ship off the

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60 Ibid.
61 Ibid.
62 Ibid.
63 Ibid., 116.
64 Ibid.
66 It is ironic that one of the Bill’s eventual downfalls was that the scheme threatened the ability for newspapers to report the cricket scores in time for printing. Tomkinson, Report and Special Report, 1909, xiii.
coast of Greenland where he and his crew ‘turned day into night deliberately’ for a change of pace in the long nights of the Arctic summer. Whether the body was in fact so pliable to such temporal shifts would be a significant point of contention in DST discussions.

In the 1909 hearing, the medical community was represented by Thomas Barlow—who had served as a royal physician since 1896. The son of a cotton manufacturer, Barlow had a keen interest in the health of working people and nutritional diseases like rickets, even naming the childhood form of scurvy ‘Barlow’s Disease’. In his testimony, he reinforced the importance of sunshine for promoting health, both directly and indirectly. Barlow was particularly concerned with what he saw as the urban-dwelling lifestyle—divorced from ‘a more natural mode of living’. ‘To be out in the open air and sunshine for as long as possible in the day and to reserve the dark hours of sleep’ was the ‘natural’ daily rhythm that Barlow believed the human body required to maintain health. The shift from an agrarian way of life was for Barlow the cause of many ills of contemporary urban society. Working in cramped indoor conditions, for long hours and under artificial light was the cause of the greatest health challenges of the city: anaemia, consumption and failing eyesight. All three of these Barlow felt DST would go some way to ameliorate.

The spectre of chronic anaemia in the working population loomed large in Barlow’s testimony. He asserted that ‘blood making and blood repair’ were essential to maintaining health and preventing the onset of urban diseases. Anxieties about Britain’s ‘anaemic’ working classes abounded in the early twentieth century. As Keith Wailoo has argued, anaemia was an ‘insidious’ and ubiquitous presence in this period, especially in the health of working women. More widely, the anaemic body was emblematic of the physical effects of industry and capitalist work-discipline. The causes of this ‘phlegmatic and bloodless’ state, as Karl Marx described the working classes, were generally understood to be those of industrial civilization—poor diet, irregular hours and a lack of exercise. In America, research amongst new immigrants suggested that anaemia was rife and was connected with a shift from outdoor agrarian to indoor industrial work.

During the investigations of the 1903 Inter-Departmental Committee on Physical Degeneration, anaemia amongst working youths was a subject of particular concern—perceived as the result of poor nutrition, long hours, a lack of sunlight, and excessive tea drinking. As Wailoo suggests, the causes of anaemia were seen as a complex combination of societal factors, like factory work and poverty, and individual responsibility, like excessive drinking. The chronic anaemic state was also associated with the physical

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67 Sassoon, Report and Special Report, 1908, 117.  
69 Tomkinson, Report and Special Report, 1909, 156.  
70 Ibid.  
73 Wailoo, Drawing Blood, 20.  
74 Fitzroy, Report of the Inter-Departmental Committee of Physical Deterioration, 41.  
75 Wailoo, Drawing Blood, 5.
strains of puberty and menstruation and raised the spectre of whether working women would ultimately be able to fulfil their ‘duty’ as wives and mothers.76

Chronic anaemia was also linked to susceptibility to tuberculosis—itself widely understood as an occupational pathology in this period.77 Barlow observed in his testimony, ‘There are vast numbers of our population, especially amongst young men and young women...who are especially prone to consumption’.78 The only way to fight off an inherited consumptive tendency would be for these young people, ‘on the border line of ill health’, to have access to open air and sunshine.79 For Barlow, the ability for the body to produce blood and its exposure to sunshine were directly correlated. He told the Committee of a recent study of night nurses who, because of the lack of sunshine inherent in their nocturnal hours, had become extremely anaemic. The matron had insisted that all nurses should sleep ‘with their blinds up so they got a lot of sunshine’, and soon the anaemic symptoms were lessened.80 From this, Barlow believed that the solution in combatting the nation’s anaemia (and hence consumption) lay not in how much sleep one got, but one’s exposure to the sun in the daytime. ‘If we can give these delicate people enough sunshine and open air, ’ he opined, ‘we may enable them to fight the battle of life’.81

With its emphasis on the prophylactic power of sunshine, the scheme can be seen in the light of the contemporary popularity of heliotherapy. A prolific historiography has considered the importance of sunshine and exercise in late nineteenth and early twentieth century public health.82 From the pioneering work of Nobel Prize winner Niels Finsen (1860–1904) on phototherapy, to the open-air sanatoria movement—sunshine and fresh air seemed to offer the best chance to combat urban illnesses like tuberculosis.83 By providing an extra hour of evening daylight, DST was a proposition which seemed a relatively simple and cost-efficient way to provide life-saving sunshine to Britain’s working classes: Willett estimated that each individual would benefit from an additional 154 hours of sun annually.84 A widespread discourse about the healing power of sunshine underlay much of the medical testimony. Barlow informed the Committee that ‘of late years we have come to look upon sunshine and open air facilities as the most important means to neutralizing the ill effects of indoor exhausting occupations’.85 As he powerfully summarized,
in terms of health, ‘you stand to gain by sunshine all along the line’. 86 It was an argument with strong traction, with the Chairman of the 1908 Committee Edward Sassoon later encouraging ‘every London citizen [to] endorse the health-giving daylight-increasing scheme’. 87

In their medical testimony, Day, Conan Doyle, and Barlow supported the DST bills on the basis of their ability to tackle major health challenges facing Britain’s urban populations through the principles of public health. With such seemingly insurmountable challenges like national physical degeneration looming, the DST bill offered an obvious step towards improving urban disease and combatting degeneration by relocating an hour of health-giving daylight. However, in moving an hour of sunshine to the evening, the scheme effectively deprived the British populace something else very important to maintaining health—sleep. Willett believed that this manipulation of the clock had a negligible effect on the overall length of the working day—people would simply go to bed an hour earlier in order to rise at the new time. However, the change of time itself threatened to disrupt the bodily rhythmicity that followed the solar cycles of light and dark, and which industrial capitalism had already gone a considerable way to eroding. While such early-rising was seen by Willett and many others as the key to health and wealth, some critics of the scheme wondered how natural patterns of sleeping, waking and eating might be further disrupted by the implementation of DST.

Early-rising and Bodily Rhythms
Sleep held a notably contested place in the landscape of health in the nineteenth and early twentieth centuries. 88 While many physicians acknowledged the importance of sleep to maintaining a healthy body and mind, there remained a risk that too much or too little sleep could negatively influence health. In his How to Live on Twenty-Hour Hours a Day (1908), Bennett spoke to a local physician who accused his clientele of ‘sleeping themselves stupid’. 89 Such opinions drew on a much longer, moralizing discourse which associated over-sleeping with sensuality, sinfulness and wastefulness—which, by the second half of the nineteenth century, had been taken up by physicians who advised that ‘lingering in bed’ predisposed the sleeper to disease. As historians have observed, the longer history of time management was closely bound up in religious attitudes towards time—the importance placed on modest, efficient and pious use of one’s waking hours was facilitated by the increased use of clocks and other time keeping devices. 90 By the early twentieth century, such attitudes collided with the pressures of industrial efficiency, giving rise to famously wakeful inventors like Thomas Edison, who claimed to have beat the need for sleep almost entirely. 91

86Ibid., 156.
89Bennett, How To Live On Twenty-Hour Hours A Day.
91Edison was however a notorious napper, making his claims to have overcome the need for sleep somewhat less compelling. See Alan Derickson, Dangerously Sleepy: Overworked Americans and the Cult of Manly Wakefulness (Philadelphia: University of Pennsylvania Press, 2014).
At the same time, a growing endemic of sleep loss associated with advancing modernity was linked to new diagnostic categories like neurasthenia and insomnia and led many physicians to highlight the importance of sufficient and regular sleep to health. Physician and insomnia expert Joseph Mortimer Granville (1833-1900) looked upon sleep as an essential ‘rhythmic function of life’ and viewed an increasingly frenetic, interconnected world as the cause for divergence from the natural solar cycles necessary to health. By the dawn of the twentieth century, physiologists were still hard at work attempting to understand the sleep state, its causation and purpose—much was to remain mysterious until the introduction of laboratory sleep medicine in the 1930s. The case of DST reveals the centrality of cycles of waking and sleeping in modern understandings of health and the clear threat posed to this ‘natural’ temporality of light and dark by rapid industrialization, electrification and urbanization.

Concerns around sleep and its disruption by work were increasingly prevalent across the Victorian and Edwardian periods. As early as the eighteenth century, in his classic Treatise of the Diseases of Tradesmen (1705), the ‘father’ of occupational medicine Bernardino Ramazzini argued that night working was unhealthy —comparing bakers who slept in the day to night-dwelling spiders. Traditionally, many trades undertook work at night—printers, bakers, nurses, policemen. The introduction of artificial lighting in homes and factories in the Industrial period effectively extended the working ‘day’ throughout the hours of darkness. However, as the early twentieth century progressed, anxieties heightened around the possible negative health outcomes of over-night working. Self-taught classicalist and social reformer Alfred Williams (1877–1930) wrote on the experience of night working. He described working through the night in a railway factory as a perpetual struggle against sleep, with Nature, ‘demanding her rights, twitching, clutching and tugging at your eyelids’. The physical effects of this ‘inversion of the natural order of things’, as Williams described night work, were believed to be especially damaging to women. It is worth pointing out that some workers, including women, enjoyed working the night shift - with one night nurse reflecting in the columns of the British Journal of Nursing about the ‘pleasures’ of the quieter wards after dark. Often paid more, how workers valued their interrupted sleep versus lucrative night work depended on many factors including gender, age and class.

While DST only adjusted the clock by an hour, this crucial time change could force some workers to begin so early in the morning that they essentially became night workers. Surprisingly, the potential impacts of DST on sleep were barely touched upon in the original 1908 Committee testimony. It was only during the hearings of the 1909

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94 Bernardino Ramazzini, A Treatise of the Diseases of Tradesmen, Shewing the Various Influence of Particular Trades upon the State of Health (London: Andrew Bell, 1705).
96 Williams, Life in a Railway Factory, 129–130.
Committee, especially in the context of the plight of extremely early rising Post Office employees, that the potential negative effects on sleep came to the fore. As the Committee summarized in its final report—‘Sufficient sleep is of great importance and the hours of rising are largely dependent on the time of retiring to rest. As the day lengthens, it lengthens at both ends; as it shortens, it shortens at both ends’. Willett’s scheme of changing the clocks seemed only to exacerbate a departure from the ‘natural’ rhythms of sleeping and waking which were being wrought by industrial time management.

One of the central arguments of Daylight Saving Time was that it would have an overall neutral effect on the number of hours worked in a day—starting work an hour earlier also meant ending an hour earlier. However, if more time was being given to evening outdoor recreation, then surely some time was being taken away from sleep? Richard Bell, MP for the industrial area of Derby, was quite sure that his constituents would not go to bed while the sun was still up, declaring that in implementing the scheme ‘you are taking an hour’s sleep away from [the working] man’. As to why the people of Derby would not simply adjust their sleeping schedules, Bell replied, ‘Men do not like going to bed before it is dark’. Regardless of a manly reticence to sleep before the sun was down, how much the earlier morning starts might affect an individual’s sleep depended on their occupation. An hour of lost sleep in the evening would be more keenly felt by early rising factory and agricultural workers than the relatively later rising indoor workers, and even less so by the leisured classes.

In the Committee evidence, as with wider medical writing on sleep and insomnia in this period, the amount of sleep required by workers was perceived as highly gendered. Scottish physician A. W. MacFarlane, an authority on the subject, remarked in 1890 that, ‘men require less sleep than women... however [women] bear the loss of sleep better for a time’. Insomnia in men was typically associated with overwork, business worry and exhaustion of the intellect—and linked with the nervous disease neurasthenia. In contrast, women’s sleeplessness was often understood to be reflective of anaemia, disorders of the sexual organs, or insanity - or simply the natural result of child-rearing responsibilities. Age was also a determining factor in sleep need, with MacFarlane recommending ten hours for children, eight hours for those in middle age, and considerably less for the elderly. As Bell indicated, going to bed early was infantilizing to British masculinity—associated more with the needs of children than robust adult men. Perhaps drawing on a medical rhetoric which saw sleep in women as subservient the needs of their children,
the Committee’s concern for sleep disruption in women was more around whether the change in schedule would affect the meals they needed to prepare for their families.  

The group of early-risers whose health seemed the most under threat by the new DST measures were the staff of the Post Office. By the early twentieth century, the British Post Office was the largest postal organisation in the world, controlling not only the post but also the telegraph and some telephone services and employing nearly 200,000 people. London was the main sorting centre for a third of the mail in Britain—and sorters worked around the clock to support the constant pressure of the post. As David Green, Kathleen McIlvenna and Douglas Brown have shown in their wide-ranging work on health in the Victorian Post Office, the physical and mental pressure of the work resulted in a rise of health problems like eyestrain, consumption, nervous debility and orthopaedic injuries, and often ended in sickness absence and early retirement. To redress this issue, in 1855 a specialist in-house medical service was established for (certain) employees. Trade unions within the Post Office pushed for improvements in working conditions which were characterized by noise, dust and arduous hours. For daytime working and office-based clerks and telephonists, the opportunity to gain an hour more sunshine in the evening was seen as a boon. Postmaster General Sir Henry Babington-Smith informed the 1909 DST Committee that the approximately 30,000 employees who made up the UK Postal Clerks’ Association and the Postal Telegraph Clerks’ Association felt that ‘the Bill will not adversely affect the members of the association... [and] as the hours of attendance would not be lengthened they do not anticipate any strong objection to it.’ However, the suggestion was met with horror by early-rising deliverymen and postal sorters. Many sorters started their morning shift at 4 a.m., and the idea of beginning work at what was effectively three in the morning seemed like a physical impossibility.

Edward Nevill spoke to the 1909 Committee on behalf of the Fawcett Society—an internal Post Office union representing about 7,000 London-based postal sorters. Nevill informed the Committee members that his colleagues coming off early-morning shifts experienced, ‘a feeling of nausea and inability to eat their meals until they have had some sort of sleep in the afternoon’. Split shifts and overnight working meant that late nineteenth and early twentieth century post men and sorters often complained of sleep deprivation and gastrointestinal upsets brought on by their working patterns.

Only a few years earlier, in 1896, an Inter-Departmental Committee led by Lord

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112Ibid., 103.
Tweedmouth had investigated the notorious ill-health amongst postal workers and found that the long-term results of extreme early-rising were the cause of ‘a greater percentage of tuberculosis among the sorting staff’. 114 According to one contemporary study, Post Office telegraphists were twice as likely to die from tuberculosis than their peers in the general populace. 115 The rate at which indoor postal workers seemed susceptible to the disease baffled physicians—as they could not assign it to typical causes like ‘poverty, drink or ignorance’, as one medical man put it. 116 This meant the high incidence of the disease was due either to the insanitary condition of the working areas or the fact that ‘many [of the staff who] engaged in night work, often beginning in the very early hours, do an arduous duty without taking any proper food even of the simplest kind’. 117 Tiredness and irregular meals could wear down the physique, and result in respiratory illness. In this context, the time change proposed by DST seemed particularly dangerous to health.

How early was it possible for a human to get up in the morning without compromising health? To answer such a question, the Committee looked to its key medical witness—Barlow. He opined that the lowest point of bodily ‘vitality…is generally considered to be about 4 o’clock in the morning’. 118 He qualified this by explaining that, ‘It greatly depends, of course, on how the day is spent, how the hours are allotted, and how the food is taken and the sleep’. Nevertheless, 4 a.m. was the crucial hour where the body was at its weakest and, ‘that is the hour with many people with wasting diseases when death comes; it is the time when we are most anxious’. 119 That the early morning represented a time of considerable danger was seemingly widespread knowledge in this period. In an article on the importance of sleep for the popular magazine Girls Own Paper, the medical columnist observed, ‘At that hour of the morning then, between dark and daylight, the body is at its weakest and the heart at its feeblest point. It is ebb-tide and at this time the lamp of life is more apt to flicker and go out than at any other period of the day or night’. 120 Even the producers of Dr Tibbles’ Vi Cocoa, a restorative drink, observed in advertising materials that, ‘there is a certain hour of the night, well known to doctors, when human vitality is at its lowest ebb—the hour when strong men are weakest—when sick men die’. 121 Therefore, the idea of rising at this crucial hour, or even before, could be understood as a direct threat to life. As Nevill warned, ‘Many of the men have to leave home at half-past two in the morning under the present arrangements, you will be able to realise what one more hour would mean…upon the disposal of the work’. 122

However, Barlow was confident that the body might adjust to even these temporal extremes. By obtaining more sunshine during the day, the body would be better prepared to adapt to a new rhythm. Like Conan Doyle on his Arctic whaler turning day to night, Barlow was assured of the plasticity of bodily rhythms. ‘The power of equalization

114 Tomkinson, Report and Special Report, 1909, 163.
117 Ibid.
118 Tomkinson, Report and Special Report, 1909, 158.
119 Ibid., 158.
and adaptation in the human subject is enormous’. As he demonstrated in the case of the night nurses, even an extreme sleep schedule could be easily accommodated if enough sun was obtained. Vitality was naturally lower in the early morning—but this was not a fixed rule, he suggested, and depended on an individual’s way of life. Alterations in eating schedules could help to change the hour of the low point in vitality—and any sleep loss could be made up in the form of ‘a midday rest’. Barlow testified that he had treated numerous Smithfield butchers who routinely woke up as early as three in the morning, but who were able to maintain their demanding work schedules through the practice of a daily siesta. ‘That would possibly be Nature’s own method tending to equalize it [early morning starts]’. If people did find themselves getting progressively more tired from early rising, this would eventually lead them to get to bed earlier, sun or no sun.

Despite the supposedly healthful benefits of moving the hours of daylight, questions around sleep contributed to the ultimate downfall of the DST bill. For his part, Willett believed that a seasonal time change would result in better sleep—shifting the hours of rest to the darkest part of the evening. However, the testimony of early morning workers like Nevill helped to convince the Committee that the shortening of the morning hours would ultimately have a negative effect on rest and health, despite the benefits which sunshine could bring to tackling anaemia, failing eyesight and respiratory disease. As the 1909 Committee summarized, ‘the necessity for sleep prevents people rising until a sufficient time has elapsed after their retiring to rest’. Postal workers who needed to start their day at four am were particularly at risk of cutting short their time for rest at the moment when their ‘vitality’ was at its lowest. Of course, not all the evidence pointed in a negative direction. As Barlow testified—daytime napping or a ‘siesta’ might be adopted into British culture and could serve to equal out any imbalance of sleep at night. Even in the case of the incredibly early starts of postal or market workers, Barlow reassured the Committee, ‘It is marvellous what the human body can adapt itself to in regard to arrangements if done gradually and cautiously’.

**Conclusion: Towards a History of Biological Rhythms**

Barlow’s advice to the Select Committee echoed a growing interest among early twentieth century physicians and physiologists in the biological rhythms of bodies, such as sleeping and waking, eating and fasting. Of course, timing and rhythms had been central to conceptions of health since at least the time of the Ancient Greeks—with Hippocrates’ six non-natural things highlighting the importance of regularity and cyclical functions like eating and sleeping. By the nineteenth century, new technology like the thermometer

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123Ibid., 159.
128Ibid., 158.
piqued a further interest in the periodic nature of body temperature, infections, mental illness and even parasitic diseases. At the same time, the growth of physiology and the work of scientists like Angelo Mosso and Étienne-Jules Marey viewed rhythmicity as the key to solving the industrial fatigue problem through the ‘law of least effort’. As French experimental psychologist Charles Féré argued in his classic *Travail et Plaisir* (1904), rest was the natural accompaniment to work—and principles of repetition and alternation allowed the restoration of equilibrium in the human motor. As he summed up, ‘Rhythm is the principle of order in all time and in space’. This fascination with rhythmicity was far from limited to the natural sciences. In the early twentieth century, anthropology, philosophy, art, music, cinema, literature and dance, all drew inspiration from rhythms—with writers like Virginia Woolf and D. H. Lawrence suggesting that rhythms formed the basis of modern life.

Aberrations to the ‘natural’ rhythmicities of resting and eating that attended modernity were linked by physicians like Benjamin Ward Richardson with new and often amorphous pathologies like neurasthenia and gastric problems. As historian E. P. Thompson famously observed in his essay on work-discipline, industrialization brought with it a new sense of time divorced from nature. In the case of Daylight Saving Time, we see the embodied results of this disjuncture and its effects on the health of workers. As Granville reflected in his work on insomnia:

Nature indicates the proper time and the due length of sleep by the alteration she effects in the external light. The relative lengths of the night and day, the appointed periods of sleep and waking life are beautifully adapted to the conditions of the climate, the temperature, and the general surroundings. To such perfection is this adaption carried that the very transit from day to night is adapted to the special requirements of each zone.

Undoubtedly, Barlow would have concurred that the best health could be obtained when people lived in the ‘natural mode’ for their temperate climate. Willett believed that the alteration in clock time would actually permit the British public to live closer to the natural seasonal oscillations by bringing the hours of waking into the daylight.
However, many others interpreted Willett’s plan as an ‘unnatural’ disturbance of the standards of clock time to which they had become accustomed.\textsuperscript{140}

Ultimately, the 1909 Special Committee recommended against the DST Bill. The initiative was dropped (aside from another ill-fated attempt in 1911) until it was reinvigorated as a cost-saving wartime measure in 1916 and in response to rival German’s implementation of summer time as an efficiency booster that same year. The decision to reject the initial DST bills is surprising, given that the scheme seemed perfectly suited to the policies of the Liberal government and their commitment to ‘stabiliz[ing] Britain’s class-riven society’ through welfare reforms.\textsuperscript{141} However, discussions around the disruptions of sleep and the potential health ramifications of early-rising undermined Willett’s scheme. The economic losses which would be incurred by agricultural workers struggling to make the milk train schedule, as well as the possible disruption to the trans-Atlantic stock exchange, European-bound mail trains, and the threatened loss in earnings to ‘night time’ industries like theatres and music halls, contributed to the bills’ demise. It came as a blow to many who believed that the scheme was of inestimable benefit for shop assistants, clerks and other indoor workers. Only a few years later, Lloyd George’s National Insurance Act of 1911 succeeded in implementing many of the same preventative health principles that DST aspired to. Nevertheless, in the case of DST it seems that Committee members were not willing to recommend yet another incursion of the government into the private time of workers—even if it would allow them another hour of healthy sunshine.

The evidence brought before the DST Committees reveals the increasing acknowledgement that there were limits to what the human body could productively achieve—particularly without regular and appropriately timed rests for food and sleep. While Barlow was optimistic about the ability for the human body to adapt to new temporal regimes, even the hard working butchers of Smithfield market needed to find time to take daily naps. Living well, even in urban contexts, was perceived as aligned with the solar environment—sleeping in the night and being active in the day, ideally under the sun, produced the healthiest and most productive workers. While William Willett argued that the changing of the clocks allowed people to live more in keeping with the natural seasonal rhythms of day and night, it was not a pattern that could be achieved for all sectors of Edwardian society, many of whom already worked ‘round the clock’ to keep Britain’s industries running. A change to these rhythms might help some, like shop girls, but could hurt others. The temporal stress of the proposed time change seemed only to emphasize the diverse and often uneven rhythms of working life in this period.

The practice of Daylight Saving Time remained controversial across the twentieth century, and in 2019, the European Union voted that from 2021 member countries would have the option to discontinue the practice.\textsuperscript{142} This move was largely informed by new findings by epidemiologists and the growing field of chronobiology which have

\textsuperscript{140}\cite{Tomkinson}, Report and Special Report, 1909, 190.
demonstrated the connections between timing, rhythmicity and health. At a moment where contemporary bioscience is increasingly focusing on the temporal aspects of many diseases, in particular metabolic disorders like diabetes, the case of DST reveals the historical importance of rhythmicity to understandings of health in the late nineteenth and early twentieth century. The DST debates testify to a long history of biological rhythms in medical thought, and opens the door to a renewed interest in time, timing and temporality for social historians of medicine in the modern period.

Acknowledgements
I would like to start by thanking David Rooney, who put me on to the subject of daylight saving time, and I’ve been obsessed ever since. With thanks to my colleagues at Medical Museion and the circadian scientists at the Novo Nordisk Foundation Center for Basic Metabolic Research (CBMR), whose research continues to inspire me in unexpected ways. Many thanks are due also to the two anonymous reviewers, whose comments greatly improved this piece. Finally, thank you to David Green, Laura Newman, Kirsten Nabe-Nielsen and Teresa Doherty for their comments and helpful reading suggestions.

Funding
This work was supported by the Novo Nordisk Foundation (NNF18CC0034900).