

**Averages, indexes and national income:
accounting for progress in colonial Australia**

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ABSTRACT

Economic statistics are now such an ingrained feature of everyday political discourse that they have recently become ripe as topics of historical scrutiny. This study contributes to this scholarship by shifting attention from what has been a largely American-Anglo discussion to the innovations of prominent Australian statisticians in the colonial and early Federation periods. In contrast to recent approaches that have treated economic statistics as emerging during the twentieth century as a discrete body of knowledge distinct from nineteenth-century ‘moral statistics’, this history is approached as an exercise in ‘accounting *in* history’. It highlights both patterns and discontinuities in governmental deliberations that facilitated statistical innovation, historicising and complicating the relationship between economics and statistics as domains of knowledge. By drawing attention to the tensions and overlaps of successive intellectual projects engaged by Australian government statisticians – described here in terms of transparency and control; the average man and colonial progress; the breadwinner and national wealth; the human unit and the social organism; and the consumer and ‘the economy’ – it develops new perspectives on why calculations of economic averages, indexes and national income emerged as devices of government. As major producers and consumers of contemporary economic statistics, such perspectives might provide fresh epistemological and interdisciplinary grounding for business and management scholars.

Keywords: Statistics; economics; government; expertise; Timothy Coghlan

Introduction

Economic indicators and macroeconomic statistics are today such familiar features of everyday government and expert discourse that they seemingly describe the natural furniture of the world. Accordingly, these numbers have also become ripe for critical scrutiny. In recent years, economists, sociologists and historians have been interrogating the highly politicised twentieth-century constructions and uses of these numbers. With this scholarship, we have come to learn that the explosion in economic statistics collated and published by national governments was more than a by-product of the ‘Keynesian revolution’, but reflected its own distinctive revolution in economic knowledge that emerged parallel to macroeconomic theory and econometrics in the late-nineteenth century, transforming the objects and aims of twentieth-century government (Tooze 2001). Propelled by the planning needs of two world wars, depression and the birth of international agencies such as the ILO, IMF and OECD, historians have charted the successive innovations in trade balance calculations, unemployment figures, consumer price indices and standard of living measures, and most significantly, national income accounting (Walters 2000; Stapleford 2009; Clavin 2013; Schelzer 2016). Historicising these figures has helped demonstrate how statistical innovation gave rise to a new conception of ‘the economy’ as a relatively autonomous, bounded, measurable entity. Often such scholarship has concluded this ‘invention of the economy’ resulted in a fundamental depoliticisation of social life, with key policy decisions arrogated to experts and technocrats in an inaccessible and incontestable language (Buck-Morss 1995; Mitchell 1998, 2002, 2011; Breslau 2003; Schabas 2009; Speich 2011; Danby 2017). Similarly, others have scrutinised how one specific number, gross domestic product, has come to dominate the political imagination (Fioramonti 2013; Coyle 2014; Karabell 2014; Philipsen 2015; Lepenies 2016).

This scholarship has represented an important critical effort, denaturalising and problematising what are often taken for granted as mere representations of material life. It also has significant implications for business and accounting scholars. As Eli Cook has recently shown, the growth of governmental economic indicators marked the migration and application of accounting and business techniques from the private sphere to increasing aspects of political and public life. By calculating the ‘general price level’, ‘overall productivity’, ‘business cycle’, or ‘aggregate demand’, so economists and bureaucrats created standardised metrics with which businesses made decisions about investment, trade and employment, thereby rationalising the new corporate order (Cook 2017). New price-based measures monetised human behaviour, personal skills and cultural preferences as capitalised pecuniary investments, legitimising modern capitalism’s boom-and-bust cycles and uniting diverse industries with shared interests and concerns (Friedman 2014; Stapleford 2017). As both major consumers and producers of economic statistics, these insights into the norm-shaping capacity of statistics offers a powerful interdisciplinary aid to accounting, business and management academics. By acknowledging the historical, normative and often political construction of the data on which they both rely and collate in their investigations, these scholars can steel their analyses against

anachronism and assumptions about the timelessness or neutrality of their categories. In engaging with the historiography of economic statistics, business and management scholars might deepen understandings of how their scholarship is often ‘reflexive’ or ‘performative’, bound up with constituting the very phenomena they seek to explain (Spicer, Alvesson and Kärreman 2009).

The purpose of this article is to deepen and complicate these links. In what follows, I develop an alternative Australian perspective on the history of economic statistics as a distinct form of knowledge. In short, this is a plea to inject some historical and geographical specificity into a subject that has largely been approached from global, US, British or German perspectives focusing on the second half of the twentieth century. In so doing, the aim is not simply to broaden understandings of the geographical and political contexts in which economic statistics were invented but to deepen our sense of what problems and processes drove such invention. It also aims to ask what it means for a statistic to be ‘economic’, and of the tensions and rivalries between economics and statistics as forms of knowledge. For if economic statistics are the primary mode by which modern governments come to ‘see’ policy problems (Scott 1998), and in turn help define the issues studied in contemporary management schools, we need to pay closer attention to the norms and objectives encoded in statistical reasoning. To this end, we can treat the history of economic statistics as a variation on ‘accounting *in* history’, where the aim is no longer to write *histories of* accounting, but consider the various schemes, measures and techniques that are used to systematically construct and conduct intellectual deliberations. It is to ask what is being accounted *for* in the making of these numbers (McWatters 2014; Walker 2005). The history of official economic statistics ought to fall squarely in that agenda.

My point of departure is with two puzzles that have emerged in the recent literature. The first puzzle relates to chronology. In many ways, studies on economic indicators bring to full fruition the insights first generated by an older generation of scholars working on the history of statistics. From the 1980s, these scholars brought to light the now-familiar understanding that statistics are not mere representations of a pre-given world, but a social practice that make things ‘hold together’ in new and purposeful ways, such as constituting populations as objects of modern government (Desrosières 1990). This process has now been demonstrated in British, German, Italian, French and US ‘national’ contexts (Mackenzie 1981; Perrot and Woolf, 1984; Porte, 1986; Hacking 1990; Desrosières 1998; Poovey 1998; Partriarca 2003). Such scholarship also demonstrates that the ‘avalanche in printed number’, as Ian Hacking called it, began a full century before governments began regularly collecting economic statistics (Hacking 1982). While some of this early state counting was tied up with enumerating agricultural and industrial production, most of it related to censuses of populations or ‘vital’ statistics measuring social deviancy and normalcy: births, marriages, deaths, literacy, madness, suicide, crime and so on. However, aside from some (misleading) gestures to the seventeenth-century political arithmetic of William Petty as ‘anticipating’ twentieth-century national income accounting, the possible passages between these earlier forms of government enumeration and twentieth-century

economic statistics remains unclear. Cook's recent account has been an exception, arguing nineteenth-century America witnessed a great struggle over how 'progress should be measured', whereby 'moral statistics and other non-pecuniary social measures' were increasingly eclipsed as 'price statistics that imagined society as a capitalized investment gained the upper hand by the early twentieth century' as the 'leading benchmarks of American prosperity' (Cook 2017, 4). While a powerful heuristic, this dualism – between nineteenth-century 'moral' and twentieth-century 'economic' statistics – risks not only misdescribing the original intentions of many heterogeneous quantitative projects, but also obscures the ways in which twentieth-century economic statistics might be understood as both a legacy, as well as a conceptual break, with earlier nineteenth-century projects (Stapleford 2018). Indeed, different nations pursued and developed the idea of national accounts in the twentieth century for competing moral, military and political purposes (Perelman and Marietta 2005).

A second, related puzzle regards the geographical limits of recent studies into the history of economic statistics. Specifically, Australian economic historians will wonder how the late nineteenth-century government statist of colonial New South Wales, Timothy Coghlan (1855-1926), fits into this picture. Coghlan has long been recognised a 'pioneer' in formulating national accounts. In his classic anthology of the development of national income estimates, Paul Studenzki regarded Coghlan's estimates, first published in 1886, to be 'the first modern estimates to embrace all three aspects of national income – production, distribution and disposition' (Studenzki 1958, 151; Arndt 1949). More recently, Bryan Haig has argued Coghlan's estimates covered most of the series used in contemporary current macroeconomic analysis, including national income and wealth, consumption and savings, government transactions, balance of payments and capital flows, and prices and real wages (Haig 2004). Thus on first glance, Coghlan disrupts the accepted chronology of the triumph of economic statistics and geographical focus of when, where and by whom 'the economy' was invented.

In what follows, I revisit Coghlan's numbers and contextualise his contributions as a government statist within a longer trajectory of colonial and early-federated Australian statistical inquiry. Australian colonial statisticians are important figures to fold back into the global history of economic statistics. While much recent work has focused on the efforts of Americans such as Irving Fisher, Wesley Mitchell and Simon Kuznets, or Britain's Colin Clark, in their own day Coghlan, along with contemporaries William Archer (1825-1909) and Henry Hayter (1821-1895), and later George Knibbs (1858-1929), the first Commonwealth Statistician after Australian federation in 1901, were world-renowned statisticians with expertise in designing censuses and studying vital statistics, birth rates, income aggregates and price and wages indices.

However, recruiting Coghlan and his contemporaries into any linear process of developing and refining national accounts does considerable damage to their specific projects (cf: Groenewegen and McFarlane 1990, ch 4). It also misrecognises the unstable, contested and changing boundaries around what constituted an 'economic' fact or statistic throughout this period. Rather, my starting point is to treat these official colonial and Commonwealth statistical archives in terms set out by Ann

Laura Stoler: as efforts to impose and enforce a collective ‘common sense’ that made colonial populations, geographies and resources manageable to government (Stoler 2009). While scholars of colonial Canada and India have demonstrated the importance of statistical knowledge in reifying national populations and economies (Curtis 2002; Goswami 2004, Kalpagam 2014), the question posed in this article is what competing modes of ‘common sense’ were Archer, Hayter, Coghlan and Knibbs seeking to establish in calculating their different measures and indicators?

What emerges from this analysis is an evolving set of patterns and discontinuities in colonial statistical enquiry. The period under review stretches from the settlement of the penal colony in the late-eighteenth century through to the Commonwealth Bureau of Census and Statistics’ first publication of national income accounts in the 1940s. Within this period, I trace a series of overlapping projects in which statisticians attempted to define and measure both the individual subjects and the overarching objectives of government, each informing but also often in tension with the other. Five successive projects are examined over the course of this period: the use of numbers by early imperial officials to illustrate government ‘transparency’ that empowered subjects even as counting populations was developed as a means for social ‘control’; Archer and Hayter’s attempts to account for an Australian ‘average man’ in terms of a more generalised ‘colonial progress’; Coghlan’s constructions of the male ‘breadwinner’ whose indexed wages and purchasing power was determined by the distribution of ‘national wealth’; Knibbs’ calculations of an individualised ‘human unit’ who evolved as part of the national, imperial and global ‘social organism’; and, lastly, twentieth-century economists’ rationalised ‘consumer’ occupying ‘the economy’, in which private purchasing power was regulated in maximise national aggregates. In tracing these successive projects, I argue that there is no simple genealogy between these statistical outlooks. It also disjoints any sense of a clean break between ‘moral’ and ‘economic’ statistics, but instead brings to light a set of ongoing conflicts and tensions over how a settler society might be ‘accounted for’; between the individual and society, between statistics and economics. Shifting intellectual trends, international engagements, processes of professionalisation and the politics of disciplinary knowledge were all inflected differently in each of these projects. The point here is not to see each project replacing its predecessor but to highlight a pattern in the attempts by statisticians to achieve the impossible balance between agency and determinism that has been the recurring theme of modern liberal government (Dean 2010). By exercising this tension historically, business and managerial scholars might also be encouraged to reflect on their own contemporary uses of economic indicators.

From transparency and control to the average man and colonial progress

When Timothy Coghlan entered New South Wales’ nascent public service in the land department in 1873, government statisticians were already coming to occupy a central place in colonial Australian statecraft. By the time he was appointed New South Wales’s first Government Statistician in 1886, an

office now made distinct from the Registrar-General, they were world-renown experts. Upon leaving the office in 1902, Coghlan and his fellow Australian statisticians were perhaps the most important public officers in the new nation. By then, the *Argus* newspaper estimated Coghlan was a more quoted public figure than the prime minister or opposition leader. This remarkable career trajectory of Australia's statisticians was shaped by multiple conditions, including the needs of the settler community, the relationship of these statisticians to their international community, and the relatively inferior status of Australian economics. Initially, however, it extended from the patterns of Australian penal governance.

From their founding in the late-eighteenth century, the Australian colonies had been heavily and regularly enumerated entities. This extended from the British imperial government's development of new techniques of information gathering to monitor their colonial possessions in the aftermath of the American Revolution (Laidlaw 2005; Bayly 1997). The initial population musters were replaced in 1822 with a much more comprehensive annual 'blue book' that enumerated all aspects of colonial life, from tax schedules, duties and fees, civil lists, population, livestock, land under cultivation, exports and imports, currency and geographical and topological subjects. Following British precedent, from 1831 the New South Wales colonial legislature published annual abstracts of its Revenue and Expenditure. By the late 1830s, the imperial and colonial governments were together collating detailed migration statistics, including average wage and price rates in colonies, to promote and manage the government-assisted migration programmes. When the Australian colonies followed British precedent and began establishing local registrar-general offices in the 1850s to centralise statistical collation, particularly births, deaths and marriages, they boasted among the best and most complete records of official statistics in the world. Yet what, exactly, was being counted?

The practices of government counting in early colonial Australia were informed by ideas that originated with the seventeenth-century political arithmeticians. As a technique, political arithmetic treated social enumeration less as a method for revealing social processes that could be studied as abstract generalities, than a system that imposed social order by nominating discrete entities to be controlled for purposes of war or public order. Control of the kingdom's resources, and not economic calculation, was the standard project of William Petty and his contemporaries (McCormick 2009). Consequently, exercises in government enumeration had long been regarded suspiciously by the British public. Landowning élites considered such monitoring as a form of excessive rule that infringed their liberties and threatened increased taxes (Levitan 2011; Buck 1977). In the second half of the eighteenth century, Dissenters such as Richard Price inverted this logic by proposing that number could be equally used to monitor the excesses of government. Pre-empting such embarrassment, by the beginning of the nineteenth century government was enumerating itself as an exercise in 'transparency', publishing abstracts of national expenditure and civil salaries. The origins of annual 'Revenue in Expenditure' accounts therefore had little to do with calculating national

wealth but illustrating prudent administration against charges of ‘Old Corruption’ (Buck 1982; Hoppit 1996; Harling 1996, 59-62, 72-4).

Administrative enumeration in the Australian penal colonies reflected both these impulses. On the one hand, it was a residue of the older idea that counting could monitor and control convict and migrant labouring populations. Accordingly, the collation of Blue Books was accompanied by commissions of inquiry to monitor colonies throughout this period. On the other hand, number was used as a technique of transparency, to demonstrate that these new colonial projects – whom critics in Britain liked to attack as hotbeds of patronage and cronyism – were ‘cheap’ and rational. Numbers thus arrived in European Australia bearing the old tensions as a tool of both state transparency and control.

As the annual Blue Books piled into the London Colonial Office from around the empire each year, officials possessed no clear sense of how this accumulating deluge of numerical ‘facts’ ought to be interpreted. Despite the premium the Colonial Office put on their collection (colonial clerks were docked their pay if returns were submitted late), much of this information was never used by London. The returns were not tabled to Parliament until the early 1840s, were not printed, and little was done in the way of comparing colonies. In 1837, a House of Commons Select Committee on Colonial Accounts and Expenditure found that while the regularity and accuracy of returns had improved over the preceding decade, they were not audited either in the colonies or in Britain. Other witnesses expressed little practical use for the numbers. The blue books were considered by London officials simply ‘as complete a document as you can well have; it contains every information’ (Parliament: House of Commons 1837, 109).

In colonial New South Wales, compiling the Blue Books was a constant burden. Initial confusion existed over who was responsible for the annual return (it was the Colonial Secretary), and there was a constant struggle to get returns from various departments and magistrates on time (Watson 1914-26, 12: 69-70). As late as 1842, the Colonial Secretary Edward Deas Thomson still complained it was ‘perfectly impossible’ to complete the Blue Books by the necessary date, even with four clerks working full time (Watson 1914-26: 22, 434). The surviving archival records used to compile the Blue Books are littered with checklists and reminders of returns not received from various districts, while reprimands from London pointed to repeated mistakes.¹ The 1828 Blue Book, for example, recorded more hospital patients for that year than the colony’s entire population (Watson 1914-26, 15: 406-7). Agricultural returns were especially pernicious. District returns were collected by constables and then collated by magistrates, who often soon followed with letters of apology for an error having ‘crept in’ by a collector placing a figure in the wrong column, a ‘clerical oversight’, or that only ‘estimates’ could be afforded.² Colonial authorities treated agricultural data with great caution even into the 1860s (Watson 1914-26, 22:430; Rolleston 1860, 8).

Compiling Blue Books did offer some scope for bureaucratic innovation and registered the first emergence of techniques that rendered the colony knowable as a bounded, measurable entity.

From the mid-1830s, Thomson, by his own initiative, began filling out his Blue Books with ‘additional contents’ for each category, experimenting with tables that gave an accumulative account of each field for the previous ten years (CO 206/75). These initiatives provided the basis for a new government artefact and in 1842 the Legislative Council papers also began publishing a more complete ‘Statistical Return’ that provided a decennial account of the Blue Book’s main categories. This practice now forged a permanent, accumulative official memory of colonial administration.³ The significance of these numbers remained lost on the public, however. While they could at times be drawn upon for polemical purposes – such as demonstrating how much the colony had ‘progressed’ since the ending of convict transportation in 1840, as indexed by rising population, exports and land under cultivation – these remained fragmentary and unauthorised interpretations of official numbers (*Sydney Morning Herald*, 5 April 1851, 2). The *Sydney Morning Herald*’s review of the 1845 Blue Book was typical: ‘We have now in our possession many of those clumsy volumes known as blue books, this name being given them for two reasons, first because they are stitched in blue covers; and secondly and cardinally, because the very sight of them gives one the blue devils. These productions illustrate the prevailing mania of this practical age for statistical information, without much regard to its use or necessity’ (*Sydney Morning Herald*, 20 January 1848, 2).

While bureaucrats at the Colonial Office and in Sydney wrestled with number as a technique of transparency and control in the first half of the nineteenth century, intellectual advances in Britain were giving statistics a stronger scientific foundation. These advances would also come reconfigure the meaning of the numbers accumulating in the offices of the Colonial Secretary and *Sydney Morning Herald*. ‘Statistics’ is an eighteenth-century German neologism, meaning not numerical representations but written, synthetic descriptions of a ‘state’. Only by the late 1820s had the word begun to refer to a new science of numerical information (Porter 1986, 19-21). Amateur ‘statistical societies’ emerged in British urban centres to measure aspects of social life, and when the newly formed British Association for the Advancement of Science (BAAS) begrudgingly included a statistical section in the 1830s – begrudgingly given the old association of number with political control, not *science* – ‘statistics’ came to public prominence and importance (Goldman 1991).

It was not yet clear, however, what this relationship between number and knowledge should be. Political economists such as J.R. McCulloch held that statistics were merely ‘raw material’ for the use of deductive, economic inquiry (McCulloch 1825, 21). Others, following the ideas of Belgian statistician Adolphe Quetelet, believed accumulating enough such ‘material’ could eventually develop a holistic and *inductive* account of the ‘social economy’ that would supplant deductive political economy as a source of knowledge. Quetelet’s formulation appealed to heterodox political economists such as Richard Jones, who abhorred the deductive method of Ricardian economics – with its reductive focus on the ‘science of wealth’ and intractable laws of rents, profits and wages – as mere sophistry. For Jones, statistics posed not a mere aid to political economy, but a new *rival* science of society that was, in the spirit of Bacon, inductive, mathematical and scientific (Goldman 1991).

McCulloch and Jones agreed on the general position that statistics ‘does not discuss causes, nor reason upon probable effects; it seeks only to collect, arrange, and compare, that class of facts which alone can form the basis of correct conclusions with respect to social and political government’ (Statistical Society of London 1838). Their conjecture was whether numerical data ought to serve as ‘raw material’ for interpretive efforts, as prescribed by Ricardian political economy, or as the basis of a new science that would inductively synthesise the entire social structure. Both views attracted great criticism from satirists such as Charles Dickens, who claimed statistics could be made to say anything, and warned statistics fostered a belief in environmental and moral determinism that curtailed human freedom. Others rebuked the statisticians’ misguided assumptions ‘facts’ and ‘theory’ could be distinguished. Some sort of theory, the critics argued, always informed fact collection (Crook and O’Hara 2011; Poovey 1993).

These tensions have never been entirely resolved because philosophically, they are unresolvable (Poovey 1998, 317). Nevertheless, statistics proved too useful to government to be discredited. Through the middle of the nineteenth century, both understandings of statistics espoused by each McCulloch and Jones’ flourished, if in overlapping ways. On the one hand, McCulloch’s ‘raw material’ version manifested in new kinds of government boards, putting numbers to work to serve the deliberations and scientific respectability of administrative departments. A Statistical Section was established at the Board of Trade in 1832, statistics were copiously collected by the new Poor Law Board from 1834 and a General Registry Office (GRO) was established to collect figures on births, deaths and marriages in 1837. At the same time, self-style ‘statists’, committed to Quetelet’s idea of a predictive statistical science of social laws largely populated these departments and advanced the techniques of collection and interpretation, such as William Farr at the GRO (Goldman 1991). Typically, then, statistics produced by agencies such as the Poor Law Board captured both tendencies. Data were collected by an army of officers which were then collated by the Board to calculate and demonstrate the effects of the new Poor Law’s impact on the ‘progress of pauperism’, as the Board’s secretary Edwin Chadwick called it. In this sense, the Poor Law Board’s numbers reflected both Quetelet’s idea that inductive collation could reveal social trends and McCulloch’s idea that the utility of numbers lay in their application to deductive reasoning, in this case, the ‘progress’ of pauperism. Emphasis lay with whether one spoke as a politician, political economist or statistician.

These developments reshaped the professional identity of statistical expertise in the Australian colonies. It also helped to reorganise the mass of colonial numbers into governable objects. As the colonies obtained self-government in the 1850s, so they established new bureaucratic institutions. Following British precedent, a Register-General was established in Victoria in 1853 and New South Wales in 1856. Those appointed to these roles were clearly conversant with European debates. Speaking to the Philosophical Society of New South Wales on the ‘Science of Statistics’ in late 1856, the colony’s first Registrar-General Christopher Rolleston (1817-1888) quoted straight from the London statistical journals, rehearsing the strict division of labour between statistics and

political economy: that the former did not ‘discuss causes’ but ‘seeks only to collect, arrange, and compare’ facts (Rolleston 1858, 254). In 1857, Rolleston replaced the colony’s annual Blue Book with a much slimmer *Statistical Register*. The latter included a single, fold-out sheet that itemised the year-on-year ‘progress’ of population, schools, convictions, manufactories, livestock, coal mined, land sales, shipping, the size and value of exports and imports, and revenue and expenditure, stretching back to 1821. This was a new kind of official remembering, one which Rolleston believed demonstrated a form of progress unrivalled in the history of the western world (Rolleston 1860). He likened his work to a merchant, inquiring ‘into the state of the national ledger’, arranging not a ‘barren array of figures put together without order meaning or utility’ but directing ‘endeavours to promote the public good’.

Rolleston’s belief in the importance of government statistics coalesced into a new mode of expertise that was to dominate colonial politics for the next half century. As Rolleston acknowledge, the progenitor of this expertise was not himself, but his fellow Registrar General in Victoria, William Archer. Archer had worked with the eminent actuary F.G.P. Neison in London and was a lifetime correspondent with William Farr. He arrived in Melbourne in 1852 with precipitous timing to take up the new role of Victorian Registrar-General the following year. Through Farr, Archer acquired a deep knowledge in vital statistics, particularly infant mortality, which at the time accounted for half the deaths in Victoria. While Farr was primarily interested in contributing to issues of public health, Archer sought to construct entire new models for understanding the dynamics of the colonial population.

While Archer, like Rolleston, set to work on rearranging the colony’s annual Blue Book into a simplified *Statistics of the Colony of Victoria*, it was his three non-official commentaries that made considerable advances in statistical knowledge. First, in his 11-volume magazine, *Facts and Figures* (1858-9), Archer drew on birth, death and marriage schedules to cross-tabulate a series of novel statistical relationships: the age at marriage and number of offspring; the mortality rate among children and among family groups; the influence of age of parents over the sex ratio of their children; and difference in birth rate, mortality and sex ratio for different races. In the last of these, Archer distinguished between British, Irish, Welsh, Scots, Chinese and Indigenous Aboriginal peoples. He also compared the life expectancy of migrants and local born, as well as influence of climate, occupation and age of marriage on infant and adult mortality rates (Archer 1858). In his 1860 *Notes on the Statistical Progress of Victoria*, Archer drew similar correlations between population, agricultural statistics, land alienation and customs returns to calculate a series of ‘averages’ – alienated amount of alienated land, acres sold, land in occupation, consumption of wheat, grown and imported – per ‘each individual’ (Archer 1860). Finally, in his 1873 *Statistical Progress of Victoria*, he drew together such averages to declare that a new ‘national type’ was developing in ‘the shape of an Australian people, whose destiny ... will ... prove ... to be the wisest, best and happiest amongst the nations’ (Archer 1873, 17).

Archer was now making number perform a different kind of function to earlier imperial officials, repurposing the mass of colonial number from operations of transparency and control towards new objectives of probabilistic reasoning. In each case, Archer took ‘the individual’ – that prodigious figure of nineteenth-century thought – as his object of inquiry. This, however, was the statisticians’ individual, what Quetelet called the ‘average man’ and Farr the ‘human unit’, calculated from the arithmetical mean of the nation’s biological, marital and ethnic qualities. For Archer, such calculations could also be extended to national prosperity in terms of property occupied and food consumed. Characterising such estimations as reflecting an early Australian interest in economic statistics, however, can be quite misleading in this context (Groenewegen and McFarlane 1990, 93-5) for it conflates two forms of knowledge that were still relatively hostile to each other and obscures the distinct idiom in which Archer operated. What concerned Archer was not any body of economic knowledge, but a problem that pervaded statistical thought in Britain, Europe and now Australia: that of a *homme type*, the characterisation of type or ‘race’ of people that could be summed up in its enumerated ‘average man’. This idiom, of course, introduced a dangerous slippage, where ‘average’ could also be employed as a fictitious shorthand, codifying the objective properties of a population that were to be preserved or altered through social policies. Such investigations into populations sparked further debate over how to interpret this ‘average man’, and his capacity for human agency in a world seemingly governed by statistical regularity (Hacking 1990, 107-8).

Archer was well versed in Quetelet’s ‘science’. He was also a regular attendee at the International Statistics Congress, which were sites of immense knowledge transfer. Nine congresses were held between 1853 and 1876, with representatives first sent from the Australian colonies in 1860, representing not the empire or individual colonies, but the Australian ‘bloc’. For colonial participants, as for other nations, the congresses helped galvanise the professional, scientific *persona* of the statistician. However, even as the congresses explicitly aimed to establish universal, standardised methods of inquiry, these meetings tended to reinforce the peculiarities of competing ‘national’ projects and localised calculations of the ‘average man’ (Randeraad 2011). In France, for example, statistics were approached as a ‘moral science’ investigating the regularities of deviancy, crime, suicide, prostitution and divorce to calculate degrees of risk in as society modernising from a ‘mechanical’ to ‘organic’ form (Hacking 1990). In Britain, the Board of Trade and Poor Law Board collected statistics as a tool of public and social administration and later extended to projects in public health, sanitation, education and social work. In Australia, as the titles of Archer’s books suggest, colonial statisticians were concerned with charting a story of civilisational ‘progress’. This progress was accounted for not in terms of pecuniary returns, but increasing land cultivation, quantity of trade, wages, rates of literacy, and height and weight ratios, each of which could be conveniently represented in terms of an ‘average per person’. For local commentators, such governmental enumeration relayed ‘one kind of story’, that of a ‘highly satisfactory, yet almost a monotonous’ colonial progress. As the amateur statistician William Westgarth put it: ‘The imports, the exports, the

public revenues, the population of this year, are all so much per cent ahead of those of last year; and in like manner this year will itself be eclipsed by the next and so on' (Westgarth 1861, 44).

The status of the colonial statistician was greatly enhanced after Archer's long-time deputy, Henry Hayter, was promoted to the newly created office of Victorian Government Statist in 1874. (Archer moved to Victoria's Lands Department). Hayter built on Archer's advancements. His first task was to convert Archer's occasional commentaries into an annual, accessible publication, the *Victorian Yearbook*. This almanac drew worldwide praise, establishing Hayter's international reputation as a pre-eminent statist. He received honorary titles with royal societies from Paris to Tokyo, while twice serving as an expert witness in House of Commons' committees into reforming statistical procedures. Hayter used his position to pontificate the role of the official statistician. 'Do not start with preconceived notions', he told a gathering of the Australasian Association for the Advancement of Science (AAAS) in 1888, echoing Richard Jones. 'Let your deductions follow your facts, not precede them' (Hayter 1890, 24). He had established this dictum in the preface to his first *Yearbook*, wishing his statistics might be of neutral 'material assistance to persons whose business or inclination may lead them to consult that work'. Addressing a House of Commons committee in 1879, he elaborated the role of the statistician: 'The function of a Statistical department is to write reports drawing attention to various matters, and instituting comparisons, but not to go deeply into the science of statistics' (Parliament: House of Commons 1881, 54).

Despite Hayter's insistence on the impartiality of the statistician, his rise to fame, and the prominence of his publications, fuelled an increasing rivalry between Victoria and New South Wales. By the latter nineteenth century, each colony had developed distinct political cultures derived from their respective adherence to protectionist and free trade policies. As has long been appreciated, the conflicts between Protectionist Victoria and Free Trade New South Wales were more than a dispute over rival tariff settings but competing philosophies regarding social organisation and paths to human flourishing (Macintyre 1991; Melleuish 1995). Hayter had abstained from commenting explicitly on this issue, telling the 1879 House of Commons committees that 'I should not think it right for a Government officers to take any part in that question'. He had, however, stoked the coals by publishing in his *Victorian Yearbook* a statistical overview of the other colonies which he used to contrast Victorian superiority. Where Archer had shown there to be an Australian 'type', Hayter wished to show not all colonial types were equal. Most spurious were his reading of criminal and vital statistics, interpreting Victoria's lower rates as evidence of the 'convict taint' in the older colonies (Hayter 1879, 212-3; Hayter 1884). It was in response to this deployment of number as barbs in intercolonial jealousies that Timothy Coghlan was appointed as New South Wales' first Government Statist in 1886. The effect, however, was to now provide the public with competing sets of figures with which to scrutinise production, trade, commodity prices and wages. Emerging colonial business councils and chambers of commerce drew on these numbers to assess their fortunes under competing trade regimes, as did British investors in colonial bonds. More fiercely, colonial newspapers and

polemicists dissected Hayter and Coghlan's annual publications for evidence to defend or attack their respective governments, viciously lampoon the competency of the authors (Goodwin 1966, 459-61).

Did these statistical disputes between protectionists and free traders reflect Australia's own experience of general shift from nineteenth-century 'moral statistics' towards the predominance of twentieth-century 'economic statistics'? Perhaps, but neither Hayter nor Coghlan themselves gave much regard for calculating a pecuniary return on investment in their publications but remained transfixed on competing computations of an 'average man'. In Coghlan's work this, figure would be increasingly domiciled by his purchasing power as much as his biological, 'racial' or marital status, shaping the industrial policy settings of the new Australian nation. However, this should not, necessarily, be seen as expressing an emergent Australian economics but a shifting of emphasis within inductive, *statistical* reasoning.

Coghlan's breadwinner and national wealth

Timothy Coghlan was appointed to the new position of New South Wales Government Statist in 1886 in large part to counter Hayter in Victoria. In December 1887 he produced the first volume of *Wealth and Progress of New South Wales*, a statistical commentary designed to rival the *Victorian Yearbook*. It ran to thirteenth volumes, ending in 1902. The objective of the book, made explicit in the opening lines of the first volume's preface, was with the rivalries of late nineteenth-century colonial politics: to 'show that New South Wales maintains its position as the leading province of the Australasia Group' (Coghlan 1886, vi).

Coghlan distinguished his book from Hayter's in its thematic organisation but also by innovating new areas of inquiry. Hayter's *Yearbook* reflected the same generic chapters used in the original *Statistical Register*: population; (public) finance; vital statistics; accumulation (banking statistics); production; law and crime; and religious, moral and intellectual progress (which he later named social condition). He later added chapters on defence and the constitution. By contrast, Coghlan arranged *Wealth and Progress* into 23 chapters – by its thirteenth edition, it stretched to 30 – which enabled him to pursue a set of more specific and tailored inquiries.⁴ Eight chapters were devoted to mostly unchanging information on colonial history, climate and geography (which Hayter crammed into four pages), followed by chapters on population, vital statistics, religious and education statistics, and law and crime statistics. The bulk of material was now with ostensibly 'economic' matters. These chapters began with estimations of the physical output and export value of different sectors of production, including mining, pastoralism, agriculture, commerce and shipping, and manufacturing. He then moved on to on 'public finance' (government revenue) and 'private finance' (personal incomes), cost of living and prices, employment (including wage rates), and 'industrial progress' (historical wages). Initially Coghlan, like Hayter, included some intercolonial comparisons,

but from 1890, in addition to *Wealth and Progress*, published a separate compendium, *The Seven Colonies of Australasia*, which offered comparative data on the colonies in most of these categories.

It was in this last cluster of chapters that Arndt, Studenzki and, to an extent, Haig, saw Coghlan as anticipating national income accounting. Arndt read in these chapters a direct anticipation of the three dimensions of modern national income estimates – income, expenditure (or demand) and output – which he mapped neatly on to Coghlan’s chapters on ‘Private Finance’, ‘Cost of Living’ and the various output estimates Coghlan offered for each sector of production. Drawing on Coghlan’s personal, handwritten workbooks (the statist gave little detail on his calculations in *Wealth*), Arndt admitted the estimations of production output were ‘crude’ and made broad extrapolations from limited data. Arndt was more enthusiastic about the detail with which Coghlan estimated family budgets and cost of living. Haig has been more circumspect about inferring Coghlan as a pioneer of national income accounting. While he noted that Coghlan’s *Wealth* could be read as possessing the full range of modern macroeconomic indicators, Haig has also stressed important differences between Coghlan’s estimates and modern national accounts. Crucially, Coghlan’s data were presented in descriptive chapters rather than a formal accounting lay-out, while his interests clearly aligned with nineteenth-century political economy rather than anything anticipating twentieth-century macroeconomics (Haig suspects an indebtedness to J.R. McCulloch).

Accordingly, Coghlan’s focus was with the distribution of wealth, not aggregates. This focus was consistent with statisticians and (and those economists still reading McCulloch and Mill) internationally across the late-nineteenth and early-twentieth centuries. This focus was clearest in his chapter on ‘Private Finance’. Under this heading, Coghlan made two, unlinked estimates of the colony’s ‘private wealth’ and ‘private income’. The former he calculated by adding up the value of property listed in probate letters of administration for a given year – comprising land and property, stocks, merchandise, coin and bullion, and shipping – which he then multiplied by that year’s corresponding death rate to estimate the value of the colony’s total ‘private wealth’. Given ‘the distribution of property is a matter of even more interest than its total’, Coghlan then proceeded to offer an estimate of this ‘value per head of population’. In early publications, this simply involved dividing the value of private wealth among the colony’s population. Later, Coghlan later drew on data collected under the Stamp Duty Act to estimate the distribution of property among six different ‘classes of estates’, ranging from those with ‘Under £200’ to those with ‘£30,000 and over’. In 1900, he estimated that less than one per cent of the 187,740 ‘persons with estates’ in the colony owned 37 per cent of all property (Coghlan 1902, 859).

Similarly, estimates of private income were concerned with tabulating the distribution of income in the colony. Coghlan’s early income estimates were depicted only in terms of the sector from which they were ‘derived’, drawing on his output calculations for productive sectors (pastoral, agricultural, fisheries, commerce, public service, etc.). He soon added to this section corresponding estimates how these incomes were divided between ‘classes’, including employers and property

owners, wages earners, the self-employed, professionals and civil service, and absentee incomes. The introduction of income tax enabled in 1898 provided Coghlan with tax returns to make a more accurate analysis of the number of persons falling into different income brackets, as well as the income earned in different occupations (Coghlan 1902, 861). This data also refined other parts of his analysis, including the chapter on 'Cost of Living', which documented the prices, quantities and value of goods consumed per individual. Coghlan described the annual discrepancy between private income and total cost of living as 'representing the savings of the people and the earnings of absentees'. The more important relationship between income and cost of living, however, was what wage could buy, or what he and other statisticians were coming to call the 'purchasing power of wages'.

These indicators were identified as problems that related to the well-being of an idealised figure Coghlan described as the 'breadwinner'. The introduction of this masculine figure was a significant advance, and rupture, on the earlier project on the 'Australian type'. Historians have, quite rightly, long scrutinised this category, which Coghlan and his Tasmanian colleague, the statistician Robert Johnston, devised to standardise the colonial censuses in 1891. Colonial statisticians had been seeking to synchronise their census since the 1870s, however the stumbling block had been finding a common classification of occupations. Since mid-century, Australian statisticians and census-makers had followed the British system, introduced by William Farr in 1851, that arranged occupation categories according to the materials a worker used. Accordingly, Farr's scheme conceived women as productive workers in the home, whether as housewives or as helpers in a family occupation. Farr was interested primarily in medical statistics and thought materials were important to determining health. Occupation, for Farr, was a medical rather than an economic category. Farr's typologies had been appropriated by Archer for the 1854 Victorian census and maintained by all colonies until the late 1880s. Coghlan and Johnston's 1891 new occupational schema was an attack on the 'hopeless incoherencies' of the Farr system. They sought to remodel the census from an artisanal to an industrial classification of work. Accordingly, the key occupational distinction in all societies, said Coghlan, was between 'breadwinners' and 'dependents'. The former encompassed six categories of wage-earners or the self-employed: professional, domestic, commercial, industrial, primary, and indefinite. Dependents were those reliant on relatives or a natural guardian, as well as wives and children, 'and others not otherwise engaged in pursuits for which remuneration is paid', including recipients of private or public 'charity' (Coghlan 1894, 270-6).

There are competing interpretations of what motivated Coghlan and Johnston to pursue these categorical innovations. For Ben Maddison (2007), it reflected their commitment to 'scientific' expertise, modernising ideas of 'skill' from a capacity that was biologically determined to one that was acquired and cultivated through industrial employment. Desley Deacon (1985) read Coghlan's innovations in the context of colonial rivalry and the clamouring for British investment. Farr's concept of national prosperity measured by the size and activity of its population was jettisoned by Coghlan, Deacon argued, because he could more advantageously illustrate New South Wales's

prosperity and potential for investment in terms of a 'living standard' of the male working population, quantified in patriarchal, family units. Either way, this redescription of skill was profoundly gendered, rendering women's work invisible to the statistician's gaze. The hierarchical rearranging between masculine breadwinners and feminised dependents had lasting legal, social, economic and cultural consequences (Alford 1986).

Coghlan himself admitted 'the term "dependent" is not altogether a happy one, seeing that under that designation are comprised married women and other who perform domestic duties'. Rather, 'the term can only be justified on the ground that for such services no money-wages are paid' (Coghlan 1896, 2:530). The statistician thus appreciated the artificiality of his construction, but it also went to the heart of his analysis. If Coghlan was extending the statistical project of Archer and Hayter in discovering Australia's 'average man' in a context of national 'progress', he was also shifting the points of reference used to analyse that subject, and epistemological basis of such progress: from an 'individual' abstracted from biological, medical, marital and social averages, to a 'breadwinner' indexed by earnings and consuming capacities.

Coghlan's reconfiguration of the 'Australian type' into a wage-indexed breadwinner drew on several complex local, national and international sources. These sources included Coghlan's own intellectual commitments, the character of late nineteenth-century Australian economics, and his participation in an international community of statistical inquiry. It is worth treating each of these briefly to highlight the kinds of assumptions Coghlan folded into statistic-making specifically as well as the ambiguous status 'economic statistics' – wages, prices, consumption – at the turn of the twentieth century more generally.

First, Coghlan's overall concern of the dynamics of national wealth as a problem of distribution assessable in terms of the 'breadwinner' can be explained by his status as a late nineteenth-century 'labour intellectual'. Writing for Sydney's radical journal the *Bulletin* under the pseudonym Henry Siebel in the late 1880s and early 1890s, Coghlan attempted to promulgate the 'standpoint of the statistician' in public life in a series of often darkly humorous discussions on crime and punishment, suicide, marriage, birth rates and drunkenness. Coghlan satirised delusions of human agency: the 'gleeful' groom was no 'free agent' but one of 16 married in every 1000 each year; children were products not of 'consenting parents' but the 'ridiculous regularity' in which 37 new lives are added to every 1000 each year; while death took no heed 'of prayers, of medicines, of charms', for '15 out of every thousand he wants and 15 he takes' (quoted in Maddison 1999, 16-17). There were clear if parodied echoes of Quetelet here, whom Coghlan admired as 'one of the greatest social economists' (*Bulletin*, 5 October 1889; *Daily Telegraph* [Sydney], 9 September 1902). But this wry social commentary was aimed at a more serious intervention against late-Victorian bourgeois social theory that tended to assume 'social evils' – poverty, unemployment, ill-health – resulted from individual failings. As Maddison (1999, 18) has argued, Coghlan attempted to show such 'evils' were universal features of human society. Because statistical inquiry demonstrated that 'men themselves do

not change', and that 'what men in the gross will do under given circumstances can be readily determined', statistics also demonstrated that 'Progress is made not by operating on the individual but by changing his environment'. Accordingly, it was 'the chief duty of society is to make that environment compatible with man's best aspirations' (*Bulletin*, 5 October 1889). For Coghlan, 'environment' was decidedly material in character. Australia's democratic achievements, he argued, were not attributable to 'our inborn love of liberty' but 'our material prosperity' (*Bulletin*, 2 November 1889). Similarly, investigating wages, prices and consumption patterns might help navigate the paradox of modern societies: that 'During every year ... there are more of the necessaries of life produced than the world requires and yet men die of hunger?' (*Bulletin*, 28 December 1889). As Coghlan advanced on several occasions, it was by equipping wage-earners to actively consume that collective national prosperity would rise, and in turn increase private wealth:

There is no more wretched mistake in economics than to suppose that saving produces wealth. It is by consuming, not by saving, that wealth is created. If everybody saved who would consume, and if nobody consumed who would save? Production and consumption are concomitants (*Bulletin*, 12 October, 1889).

This statement was less a premonition of Keynesian effective demand than a reformulation of the relationship between the individual and society, of breadwinners and national wealth. Such argumentation led to Coghlan to some surprising conclusions, such as labourers being better off renting than saving to buy a house. In the context of Australia's burgeoning racial exclusion policies, it also invited disturbing assertions against the immigrating Chinese and 'Asiatic' – who are only 'producers and not consumers' and 'make money and do not spend it' – as 'an enemy to our civilisation'. With these warnings in mind, and calculations of production and consumption in hand, Coghlan's prophecy for *white* Australian workers was bright. 'The day of redemption is at hand', he wrote in 1889, when 'the mountains of wealth and valleys of want will be made smooth'. From this, he keenly anticipated 'the equalisation of wealth, or Socialism'. (*Bulletin*, 28 December 1889).

This 'socialism' indicated a second source upon which Coghlan drew in formulating the breadwinner. In late nineteenth-century Australia, as in Britain, socialism was a highly contested term that could capture competing intellectual projects (Tregenza 2012). The antagonist of socialism was usually not capitalism, but individualism; however, it could also register a process for dialectally mediating between the individual and the collective of the state. This view spoke to Herbert Spencer's social theory that understood the individual in terms of the workings of the collective (Hale 2014, ch 2). Like Spencer, Coghlan did not advocate a primacy of the 'individual' over 'society', but by calculating wage rates and purchasing power, held that empowering individuals could produce a moral, harmonious society. In this sense, Coghlan's free trade did not contradict his 'socialism'. Following a logic expounded by Ricardo and McCulloch, Coghlan understood 'the prosperity of the

worker is identical with that of the capitalist, and is moreover the chief factor in the well-being of the state'. An increase in wages necessarily followed an increase in the rate of profit; again, production and consumption were concomitant (*Daily Telegraph* [Sydney], 22 June 1889).

Coghlan's 'socialism', which he shared with other prominent middle-class intellectuals, registered a distinct form of normative economic analysis fashionable among late nineteenth-century that sought justice from the boom and bust cycles of the 1880s and 1890s. The hub of such discussion was the Sydney-based Australian Economic Association (AEA, 1887-98), of which both Coghlan and Hayter were members. The AEA championed a normative rather than inductive or empirical mode of scientific inquiry, defined by 'tender...feelings' and 'compassion', a model that 'marr[ied] the intellect to the heart' (Butlin 1847, 20-31). Labour exploitation, profit-sharing, land nationalisation, and co-operation were regularly discussed as 'socialistic' reforms in the AEA's meetings and fortnightly journal. The other site of such 'economic' inquiry was Section G of the Australasian Association for the Advancement of Science (established 1888), where similarly diverse issues were examined. Reflecting the disciplinary instability of economics in Australia at the time, Section G (Section F prior to 1893) was variously entitled 'Economic and Social Science', 'Economic Science and Statistics' 'Economic Science and Agriculture' before 1915, and discussed a similar range of topics as the AEA. Both Hayter and Coghlan served as Section G presidents. Thus, while economics was developing a robust professional identity in the United States and Britain in these years – the former as a class of 'merchant professionals' with strong academic-institutional links and business connections, the latter as 'public-minded elites' (Fourcade 2009) – in Australia, its mutable character and reforming impulses rendered 'economics' a notably partisan discipline. Before 1920, the University of Sydney's Department of Economics was the only one of its kind in the country. Even here, while the Department's head, R.F. Irvine, taught orthodox courses in marginal utility, he also actively disseminated theories of guild socialism, syndicalism, anarchism and Russian communism. Naturally, business was hostile to an economics so willing to engage 'violent partisan controversy' (Rees, forthcoming).

Third, in addition to these political and disciplinary contexts, Coghlan's interest in wealth distribution among 'breadwinners' was stimulated by broader international discussions. Like Archer and Hayter, Coghlan inhabited not only a local colonial scientific community, but was in regular correspondence with colleagues and practitioners internationally, sharing their ideas, books and registers with leading statisticians in Britain, the USA, Italy, Germany and Austria. Reflecting on the social changes wrought by industrialisation, the major focus of this shared community was with collecting and collating 'labour statistics' (Stapleford 2009, 22-58). This interest was first marked by the formation of a Bureau of Labour in Massachusetts in 1869, which was followed by similar agencies in other states before the establishment of a US Federal Bureau in 1885. Other countries soon followed, while trades halls also collated price and wage statistics. Phrases such as the 'living standard', 'cost of living' and 'purchasing power', which had long carried rhetorical force throughout

the nineteenth century, now become objects of theoretical experimentation (Glickman 1997; Coffin 1999). Price and wage indexes were identified as useful measures to these ends. Price indices were not an altogether new statistical technique. They had been proposed and occasionally attempted since the late-eighteenth century, were used by London's *Economist* from the late 1860s in reporting stock prices, while mathematical approaches were being widely debated in statistical journals by the 1870s (Mitchell 1938, 6-8). Indexing wages was, however, a technique novel to the late-nineteenth century. Only in 1887 did the British statistician Robert Giffen, with whom Coghlan corresponded, first propose that wages might also be indexed in contrast to prices (Falkner 1899, 287). Six years later, the Aldrich Report, commissioned by the US Senate to investigate the effects of tariff reform, put such an idea into practice to test the impact of tariffs on workers' purchasing capacity. By setting a wage index next to a price index, the report illustrated a new sense of the cost of living for US workers (US Senate 1893, 10). By the turn of the century, articles calling for refined wage indexing system were being frequently published in the British and US statistical journals (Falkner 1899).

These developments bring into sharper view what Coghlan was attempting to account for across his chapters on 'Private Income', 'Employment' and 'Cost of Living' in his *Wealth and Progress*. The issue of wages was central. In the first two editions of *Wealth and Progress*, Coghlan's chapter on 'Employment' merely recorded lists of current wage levels for given occupations, just as Hayter and others had in previous years (Coghlan 1888, 409-12). The third edition marked a notable advance. The chapter on Employment now offered an historical account of the 'average rate of wages' for various occupations going back to 1830. More significantly, he used these averages to generate an index of historical 'real wages' which he contrasted to recorded 'money wages' (or 'nominal wages'). Using the average wage rate for the period 1871-1888 as the standard, he calculated indexed wages for 15-year periods going back to 1822. Coghlan insisted such calculation marked a new measure of social progress. 'The prosperity and contentment of the industrial population [was] the prime test of the progress of the country' he wrote. Given that recorded 'money wages' only indicated a nominal value of wages year-on-year, it was, he continued, only by calculating 'real wages' that afforded a 'true standard by which the prosperity of different times can be adequately given' (Coghlan 1890, 458).

Calculating an index for historically relative real wages was largely useless without some indication of what those wages could purchase. In his fourth issue, covering 1889-90, Coghlan included a new chapter on 'Industrial Progress'. The bulk of this chapter charted the movement of nominal money wages over seven historical periods from 1821 to the present. At the end, Coghlan used this data to calculate an index of real wages, using the most recent period as a standard. He tabulated the nominal and real wages against 'the price level of the principal articles of consumption' for the same seven periods, which he calculated drawing on the nominal price data collated in the chapter on the 'Cost of Living' (1892, 689). The conceptual distinctions between nominal wages, real wages and indexed price levels itself was not new, but the attempt to formulate a comparative index

and set them side by side – three years before the Aldrich report – did mark a significant innovation. Coghlan had now moved beyond an average or median rate of wages, to a calculation that expressed the purchasing power of money-wages earned in the community at a given time, relative to other periods [Figure 1]. In his Eighth Issue of *Wealth and Progress*, Coghlan streamlined the table to offer comparisons of money wages, real wages and prices, pegged against standards calculated for both the most recent (1873-1892) and earliest (1821-1837) periods [Figure 2].

{Insert figures 1 and 2 here}

The point here is not to suggest that Coghlan's *Wealth and Progress*, totalling over 1000 pages, is reducible to an analysis of real wages. Rather, it is to highlight a shift in a longer trajectory of statistical inquiry in colonial Australia. Coghlan's sensitivity for the rate of wages can be compared to Hayter's mere publication of current wage rates in his *Yearbook*, which he admitted to the 1879 House of Commons Committee were 'hardly official' but reflections of going rates offered in Melbourne newspapers. We do not know if Coghlan's sources were much better. Nevertheless, his attempt to impose an officialised calculation of the relative and historical 'purchasing power' did substantiate a new figure of government – the 'breadwinner' – and a new kind of epistemological context – 'national wealth' – that illustrated colonial progress. Coghlan's singular aim, we will recall, was to establish New South Wales' superior 'progress' relative to other colonies. The breadwinner's real wages highlighted the superior 'standard of living' in New South Wales. Of course, such numbers were never the end but always the beginning of political dispute, and critics in Victoria read Coghlan's calculations as nothing but free trade sophistry.

More was at stake in Coghlan's numbers, however, than colonial jealousies. Rather, they propelled late-nineteenth century discussions in trade union halls and government departments for various modes of social reform. Coghlan departed for London soon after Federation in 1901, and therefore took little part in the new nation's experiment as a 'social laboratory' in old age pension and wage policy. However, the calculations and surveys of the breadwinner as a model of early twentieth-century citizenship registered both new claims upon the nation's prosperity and ascribed new forms of state responsibility (Brown 1997, 240). The 'living wage' and old age pensions were soon established as the chief modes of such 'claims'. Victoria had initiated Australia's pioneering trajectory of wage legislation by establishing Wage Boards under the 1896 Factories and Shops Act, which gave employees and employers from various industries (expanded with subsequent legislation) a forum to negotiate mandatory minimum wage levels. The enforcement of minimum wages gave expression to Coghlan's attempts to mediate the individual and society, consumption and production. With the creation of a nation-wide Commonwealth Court of Conciliation and Arbitration in 1904, it soon became clear more exacting modes would be required for determining a 'minimum' by investigating the kinds of indices and ratios Coghlan had suggested.

Similar calculable claims were being made in terms of old age pensions. In 1905, Coghlan's colleague, Johnston, published calculations showing that 'every 42 breadwinners maintain, on the

average, 36 dependent children under the age of 15 years' who were yet to contribute 'anything towards the burden of the State's maintenance', as well as supporting 0.71 'helpless dependents' aged over 65 and 0.72 dependents under this age. It followed, argued Johnston, that while the 36.57 per cent of the populations' 'young and helpless' had only an ethical claim upon their parents of State, 'deserving breadwinners' beyond the age of 65 had 'both an ethical and economic right of claim to be honourably provided for by the present active breadwinners of the State' (Johnston 1905). This kind of probabilistic reasoning was institutionalised first with old-age pension schemes in New South Wales (1900), Victoria (1900) and Queensland (1908), before the new Commonwealth government established a federal means-tested old age pension in 1908. Practices of official measurement were no longer simply a matter of demonstrating the indisputable progress of antipodean civilisation, but enumerating civilisation as a matrix of individualised claims upon the state.

The human unit and the social organism

The origins of the modern concept of national income accounting is generally attributed to Alfred Marshall's *Principles of Economics* (1890) and his discussion of calculating a 'national dividend'. For Marshall, the national dividend encompassed the annual 'Net aggregate of commodities, material and immaterial, including services of all kinds.' He imagined this to capture the dynamics of production and exchange, reflecting the reality of economic life as a 'continuous stream always flowing, and not a reservoir or store, or in the narrower sense of the word a "Fund" of capital'. Reviewing Marshall's book, Arthur Cecil Pigou thought the national dividend a 'practical instrument of great power designed for service in the concrete solution of social problems.' He elaborated the concept in his own *Wealth and Welfare* (1912). Attaching a definite number to this concept, Pigou later added, would be of great significance in enabling government to measure the impact of policies on national well-being. However, as Keith Tribe has shown, it took another 40 years for statisticians, economists and civil servants to put a number to that concept in the form of national income accounts that accompanied Britain's 1941 budget (Tribe 2015, 106).

When Heinz Arndt nominated Coghlan as a 'pioneer' of national income estimates in his 1949 essay, the quest to apply a number to the concept had almost been realised, not only in Britain, but across the globe. Over the next decade, with the encouragement of agencies such as the IMF, calculating national income became as important for knowing the 'nation' as the design of its flag. Arndt's recruitment of Coghlan into this story was (at least in part) an attempt to give historical significance to a nascent and professionalising 'Australian economics', which Arndt was at the time helping establish. By the mid-twentieth century, what greater accolade could the fledging Australian profession claim than to have been instrumental in developing national income accounting? As we have seen, however, Coghlan is better understood as accounting for not national incomes but an alternative set of questions that had been handed down through colonial and international statisticians

and adapted to the unique settings of a settler colony. Despite the developments of Marshallian economics, as the Australian colonies federated at the turn of the twentieth century, this trajectory held firm. It was the statisticians' quasi-empirical concept of 'national wealth' expressed in terms of an indexed breadwinner, rather than the economists' 'national dividend', was the object of official inquiry.

Coghlan was offered the role of Commonwealth Statistician in the new Bureau of Census and Statistics but declined having been requested by the New South Wales government to take up the role of Agent-General in London. Instead, George Knibbs was appointed in 1906. Knibbs was an unlikely appointee as Commonwealth Statistician. He had no background in statistics or economics. He was trained and then worked as a surveyor in the New South Wales Surveyor-General's Office from 1877 to 1889, before lecturing on the subject at the University in Sydney until 1903 where he also taught physics. A member of the Royal Society of New South Wales since 1881, he was a prolific author on mathematics, probability and fluid mechanics. Knibbs was also a key exponent of the Australian variant of early twentieth-century vitalism and progressivism, which together with elements of Coghlan's socialism, informed the 'new' or 'Deakinite liberalism' that informed Australian projects in minimum wages and old age pensions (Roe 1981; Sawyer 2003).

Like his predecessors, Knibbs would come to international prominence, particularly for his neo-Malthusian theories of global population developed after the Great War. These grand interests were evident in his earliest years as Commonwealth Statistician. Echoing Rolleston and Hayter, Knibbs understood his role, as he told an AAAS conference in 1910, as one of 'professional expertise in statecraft, assisting the administrative statesman with his counsel and advice' (Knibbs 1910a). Under Knibbs, the purview of statistical expertise expanded considerably. Where Coghlan had sought to exhibit the capacities of the breadwinner within the context of colonial 'wealth and progress', Knibbs now took the more elemental 'human unit as the basic element of statistical inquiry', analysed in the context of 'the mechanism of the social organism'. These distinctions again echoed the Spencerian contrast between Man and State, Individualism and Socialism, but were brought to bear on more than the determinations of wages and prices. Statistical inquiry, said Knibbs, provided 'instruments for determining in what direction it is wise for the social organism to evolve' (Knibbs 1910a; 1910b, 16; 1910c, 12-13).

Within these parameters, Knibbs also clarified his objects of inquiry. He now drew distinction – for the first time among Australian statisticians – among two 'great' branches of statistical inquiry, 'Vital and Economic Statistics'. His point was not to establish discrete domains of inquiry, however, but emphasise their overlap, 'for in considering human life as affected by age or by disease, the vital element is a necessary measure of the economic'. The statistician of the early-twentieth century, Knibbs acknowledged, was now called upon to 'grasp the principles of economics and finance, the theory of money, of exchange value in general, and of price'. Such principles, however, were in the higher service of understanding 'man's' productive activities, that is, 'the situations which human

relations bring into being'. The statistician should aim, Knibbs said, to understand 'the efficiency of the human unit and the mode by which that efficiency is expressed': the term of his life, the interference of disease, his ancestral endowment, his social or antisocial qualities, his relations to peace and war, 'the nature of man's evolution'.

Knibbs evidently had great ambitions for the office of statistician. Nevertheless, he also faced considerable administrative burdens. His chief task was the production of an annual Commonwealth *Yearbook*. The first edition was produced in 1908. While similar in themes to Coghlan's *Wealth and Progress*, it was determinedly more austere in content. Where Coghlan had written of a sweeping 'Industrial Progress' measured in terms of historically indexed purchasing power, Knibbs enumerated and described 'Industrial Unionism and Industrial Legislation'. Unlike Coghlan, Knibbs account of 'Private Finance' offered no analysis of the distribution of incomes across property and income bracket, but discussed gold reserves, currency, banking and insurance. Nor was there any corresponding chapter on 'Food Supply and Cost of Living'. Rather, in the context of the Australian 'social laboratory', these were all questions now demanding more detailed and specialised attention. Understanding variations in the cost of commodities, Knibbs noted, had 'passed from the region of merely academic questions in Australia'. Such facts now influenced the decisions of Industrial Tribunals and Wages Boards and it had become 'necessary to examine the whole question exhaustively'. Consequently, it required a 'much more rigorous technique' (Knibbs 1911b).

Knibbs was responding to the developments that had followed the famous Harvester Judgement in the Conciliation and Arbitration Court in 1907, when H.B. Higgins, the Court's president, had declared workers were entitled to a 'living wage'. This decision would provide the foundation for subsequent basic wage legislation in Australia, including codifying a male breadwinner supporting dependent wives and children as the natural unit of workplace regulation (Isaac 2008; Hearn 2006). As Higgins later explained, his judicial decision extended from estimating 'a standard based on the normal needs of the average employees, regarded as a human being living in a civilised community' (Higgins 1922, v). Following this line, Knibbs set to work on several initiatives that could quantify the needs of (male) 'human beings'. In 1911, he conducted an inquiry into a European-style social insurance system, igniting a debate over Australian social policy that lasted the next thirty years (Murphy 2011). The same year, he issued a special report into the *Cost of Living in Australia* (1911a), which followed similar recent attempts in the USA and Germany. The inquiry was based on having participant households fill out 'budget books' for the duration of a year. However less than 10 per cent of the budget books were returned, leaving Knibbs with a paucity of data. In response, and again following British precedent, Knibbs' established a separate Labour and Industrial Branch of the Census Bureau which would investigate and publish annual reports on "Prices, Purchasing-Power of Money, Wages, Trade Unions, Unemployment, and General Industrial Conditions". These booklets were dense, graph- and equation-heavy, typically over 200-pages in length. Information was supplied directly via interviews and surveys from retail dealers, trade unions, employer associations, industrial

courts, wage boards, and immigration officers, as well as market quotations in the newspapers. Motivated by the needs of the arbitration court, Knibbs extended the analysis of price indexes further than had been carried out in any other country (Brambrick 1970, 8-9). He provided quarterly weighted price index numbers for retail groceries, dairy products and house rents, enabling him to provide purchasing-power comparisons across 30 major towns or capital cities. Each item represented, he said, a 'general relation' between 'the unit of currency ... and the satisfaction of human needs' (1910a). Knibbs also reported and graphed each state's nominal and 'effective' wage rates, tabulated against unemployment and 'relative output', or production per head. At the beginning of these annual reports, he included an imposing graph that compared the purchasing power of money, wholesale prices, nominal and effective wage index-numbers, and percentage of unemployed. It was a panoptic snapshot of the breadwinner's Australia, living as a complex 'human unit' with diverse claims and needs.

Knibbs reflected deeply on the nature and limits of price and wage indices, engaging closely in debates over the mathematical modelling proposed by Mitchell and Fisher. Such indexes, Knibbs said, had enabled the statistician to 'penetrate beneath the first appearances of the data' (1910a; 1918b; 1924). 'Penetration' meant more than scientific precision. It also encompassed forms of paternalistic surveillance; residue, perhaps, of number's capacity to assert 'control'. Monitoring what the average individual ate and amount of tax paid would enable government to calculate forms of social provision for the human unit without eroding the 'moral fibre' of the citizen. As Knibbs instructed in his report on social insurance, it was important for government to scrutinise private expenditure 'on various objects the national value of which is questionable' (1910c, 91; Brown 1997, 241).

Such paternalistic surveillance was more forcefully apparent in Knibbs' landmark War Census of 1915, the result of which he published as *The Private Wealth of Australia and Its Growth* (1918a). The census was called following the rising casualty toll suffered in the Dardanelles, which demanded new manpower. At the time, Knibbs distributed two schedules, a 'personal card' to be returned by every man aged between 18 and 60, and a 'Wealth and Income Card', to be returned by all those aged over 18 to ascertain the level of nation's incomes, assets, vehicles and livestock. Knibbs conceived the analysis as one of 'national wealth', and while he now explicitly saw the exercise in a continuum of estimates going back to William Petty, he made no reference to the possibility of calculating dynamic aggregates in the form of Marshall and Pigou's 'national dividend'. In fact, unlike his fascination with price indices, Knibbs conceived little practical significance for calculating the sum of national wealth. His justification of the entire inquiry was rather circular: 'A clear understanding of the essential character of such wealth is important, since confusion of thought is common in regard to thereto'. It was, as with the Blue Books 75 years earlier, a case of gathering 'information' for information's sake. After tabulating distribution of net incomes and assets and examining their correlations (between 'income and wealth') Knibbs spent much of the book

scrutinising archaic techniques of calculating national wealth – census, probate or inventory ‘methods’ – seemingly oblivious of Marshall and Pigou’s advances.

Nevertheless, Knibbs’ efforts captured global attention. Wesley Mitchell, in his *Income in the United States* (1921), commended Australia’s effort in completing ‘an actual census of wealth and income in 1915 as a war measure’, when other countries to that point had only ever made estimates. Mitchell, reflecting the growing US interest in living standard indicators, was much more emphatic than Knibbs on the importance of ‘learn[ing] whether the National Income is adequate to provide a living for all persons, whether this income is increasing as rapidly as the population, and whether its distribution among individuals is growing more or less unequal’ (Mitchell et al 1921, viii, ix). Knibb’s 1915 static snapshot offered little insight into these longitudinal questions. However, his apparent ambivalence was not a case of disinterest, but reflected his higher aims that, in the aftermath of World War One, were pushing his gaze beyond national borders.

By 1920, Knibbs had become a keen advocate for establishing an imperial statistical bureau, that complemented a wider set of ideas among British thinkers during the late-nineteenth and early-twentieth centuries for organising the empire as ‘Greater Britain’ (Bell 2007; Dilley 2013). Visions of this Greater Britain encompassed a diverse current of programmes, from imperial trade preferences to forms of racial purity. For Knibbs, it inspired something more abstract. In proposing an imperial bureau, Knibbs argued that ‘the greatest war of human history’ and subsequent ‘world-wide dislocation of economic relations’ had ‘revealed more clearly than ever the importance of statecraft ... viz., political economy and statistical science, each in its broadest aspect’. The fundamental question facing statesman and statisticians, he went on, was population growth, forecasting the world’s food and water supply, the sources of energy, enhancing the efficiency of production, the relations of Capital and Labour and distribution of wealth, together with public health and education (Knibbs 1921). Such inquiry required total vision. This plan was aired at the 1920 British Empire Statistical Conference in London, which congregated statisticians from around the dominions to discuss creating a uniform statistical system across the empire. Yet, as at the international congresses, the project stumbled over competing understandings of the purpose of statistics. Knibbs and other delegates from other dominions conceived of an imperial statistics department as a ‘central thinking office’, a ‘social and economic laboratory’ that provided ‘an integrated conspectus’ of every aspect of empire. Their British counterparts, however, maintained a more compartmentalised and administrative approach that had defined British statistical inquiry since the mid-nineteenth century. While economists such as Marshall or Pigou might have licence to author wide-ranging, integrative perspective on the national, imperial or international body, British statisticians understood their task as servicing various departmental needs: industrial statistics was the province of the Board of Trade, and employment and occupations statistics a matter for the Ministry of Labour (Beaud and Prevost 2005).

The imperial project soon fell apart, but Knibbs remained fixed on investigating the totality of the ‘social organism’. Knibbs had come to believe even before the end of WWI that overpopulation

was ‘a problem now menacing the peace of the world’ (Knibbs 1928, 6). In 1917, he published a *Mathematical Theory of Population* as a 450-page appendix to the 1911 Australian Census Report. The volume shot him to global prominence. Questions of Malthusian overpopulation drew together Knibbs interests in geology, vital statistics and economics. He calculated that given the average national annual consumption rate, and the global capacity to yield food, the earth had ‘only 450 years to exhaust the food requirement’ at present fertility rates (Knibbs 1917, 455). As Alison Bashford (2006, 66) has written, in response to German belligerence, Knibbs concerns were ‘deeply political, representing antinationalist and pacifist expositions of the political economy of life, death, food and space on planet Earth’. Such concerns, perhaps, were also a source of his continuing ambivalence to calculate *national* accounts. In his later years, Knibbs’s ‘New Malthusianism’ led him to consider a broader set of questions. He shifted his attention away from the narrower concerns of the domestic breadwinner, to the capacities for white man to live in the tropics, the wisdom of immigration restriction in an otherwise ‘empty’ continent such as Australia, and national fitness and public hygiene, so to ‘watch the evolution of these people [‘transplanted’ Britons to Australia] in an appropriate manner’.

Knibbs’ mission was existential, and in many respects his statistical work was better defined in terms of eugenics than economics. As early as 1904, before he was made Commonwealth Statistician, Knibbs had been president for Australia’s Society for Child Studies, which sponsored systematic research into school children including measuring physical and of mental ability (Watts 1994). In 1921, he was named vice-president of the International Eugenics Congress in New York. These interests, and his fears of global overpopulation, culminated in Knibbs’s final major work, *Shadow of the World’s Future* (1928), which called for a ‘a new liberalism, and less egoistic regard for the well-being of all races’, again bringing the tensions between the human unit and social organism into sharp relief. Yet the work also reflected a significant drift away from the intense focus on indices that he had introduced two decades earlier. Reviewing the book, the British statistician Ronald Fisher (1929) described it ‘political’ rather than ‘scientific’ work, as it ‘centred on somewhat improbable prospects’. It was also almost entirely bereft of the numbers, calculations and equations for which Knibbs had made a career. It was perhaps with this absence of ‘science’ that a rising ‘Australian economics’ profession seized control of official statistics.

From national wealth to national income

It was in reaction to this trajectory, rather than evolving from it, that attempts to develop a more discrete ‘economic statistics’ emerged in twentieth-century Australia. The wartime developments had impressed upon Australians that economics was not simply a well-spring of normative debate between socialists and individualists, but a technical body of knowledge that was essential to governmental planning, efficient industry and international relations. The model here was the scientific and

mercantile economics profession in the United States, headed by figures such as Mitchell and Fisher, which enthused a new generation of economists in Australia. Most significant here, as Yves Rees has recently shown, was Douglas Copland (1894-1971). Copland was a New Zealand-born migrant who was appointed economics lecturer at the University of Tasmania in 1917, Professor of Economics at the University of Melbourne in 1924, and established the Economic Society of Australia and New Zealand the same year with assistance from the Melbourne business community. Through these positions and connections, Copland sought to ‘rebrand’ economics as a positivist, scientific discipline that could readily and apolitically guide governmental action (Rees, forthcoming). Copland’s aim was to displace the persistent notion that Australian economics was a normative and ethical discipline, as it had been cultivated by the AEA, Coghlan, and Irvine at the University of Sydney. ‘Economic research and advice is not recognised as necessary for good government’, Copland lamented in the Society’s *Economic Record* in November 1925. This neglect, he continued, was partly explained by the ‘the excellent service rendered by the extensive statistical bureaux of the Governments’ (Copland, 1925, 40). Yet, because statisticians tended to focus on ‘social and more vague parts of the study’, all-important economic and industrial issues had been left to discursive speculation. Copland claimed statistics would be a more ‘exact weapon in the hands of the economist’. Indeed, ‘it is important that statisticians must also be economists.’ He lamented Australia’s excellent wage, price and cost of living statistics had been subject to no ‘authoritative economic review’, and no attempt had been made to calculate business and trade cycles as in Britain and the USA (Copland 1923). While the Commonwealth Bureau of Statistics provided information on these problems. Making economics central to government would require making economic concepts essential to official statistics. It also would mean tackling calculations of national income.

The earliest, self-conscious treatment of ‘national income’ as a theoretical problem in Australia was probably James Brigden’s *The Economics of Lyell* (Brigden 1922; Coleman et al 2006, 37). Brigden, who was to become one of Australia’s iconic public servants, was at the time working as a tutor for the Workers’ Education Association in Queenstown, Tasmania. He approached the nearby mining town of Lyell as a case study in production and distribution of wealth, and the determinations of prices and values. Copland, writing in the preface to the book, described it as the first economic ‘textbook dealing with Australian conditions’. Brigden calculated an estimate of the ‘Total Income in Australia’, which drew directly from Knibbs’ 1915 War Census but which he now set out in an accounting format modelled on Arthur Bowley’s (1919) British estimates. Without quoting him, Brigden defined this object in terms similar to Pigou’s dynamic aggregative approach: ‘all income is derived from services rendered, and distributed according to the ownership of the thing that renders the service’. Income was thus produced not by persons, ‘but the things persons possess, whether they be energy, ability or material property’. While considering the ‘human element’ was crucial to Brigden understanding of economic processes, his analysis shifted markedly from Coghlan’s domesticated breadwinner or Knibbs’ human unit. Rather, Brigden starting point was that

‘the Science of Economics has to be based upon the dominating fact of human selfishness’. Calculating national income, said Brigden, demonstrated the ‘inter-actions of economic developments on the human and social factors’. It illustrated the ‘social economy’ – or, now in clear reference to Pigou, the connections between ‘wealth and welfare’ – so that governments may partake in ‘preventative and creative economics’. Superficially, such formulations appeared to represent no major departure from the earlier interconnections between the human unit and social organism. However, Brigden’s approach inverted the relationship between vital and economic statistics which Knibbs had assumed, and with it, reconfiguring the relationship between the individual and national wealth:

If there is a Science of living it is a science of economics, and every true philosopher is an economist; he seeks to get the maximum return per unit of energy and time from every department and aspect of life. So also if we are to have a science of community life, it must aim at getting the maximum return from all of our resources, from our social power, our labour, our enterprise, our capital; eliminating waste, propagating economies, fostering progress towards the highest efficiency. The time has come not only to talk, but to act about these things (Brigden 1922, 21).

Here, then, we might conceive the kind of transition from ‘moral’ to ‘economic’ statistics described by Eli Cook in America. Yet it is important to note that for Brigden, ‘maximum return’ was not synonymous with ‘profit’ but national welfare. He thought nineteenth-century Political Economy, with its limited focus on the costs and profits of self-seeking individuals, not only a ‘dismal’ but ‘sordid’ and ‘lamentably inadequate’ science. Twentieth-century economics, a true science, should seek higher ends.

Calculating the national dividend as a guide to policy and legislation became a central preoccupation of post-war economists. Jas Sutcliffe’s *The National Dividend* (1926) which, included a preface by Bowley and now explicitly and extensively drew on Pigou, provided estimates for every year from 1911 to 1924-25. He computed these estimates using two contrasting approaches, before disaggregating the national income in terms of wage and salary earners, and national expenditure on food, clothing, housing and other spending. The *Economic Record* ran a symposium on his book the following year, cautioning against the accuracy of the estimates but praising it as offering a ‘glimpse of the possibilities of the new terrain’, all the while admitting still having the ‘foggiest notions of what the National Dividend really means’ (Giblin 1927, 190). Frederic Benham’s *The Prosperity of Australia* (1928), written in response to Sutcliffe, used estimates to launch an argument for the extension of the living wage, which had ‘now taken firm root in the national consciousness’ and should be applied ‘to every citizen and should apply *all the time*’ (1928, 238, 244). Such arguments, which were increasingly inflected with knowledge drawn from neighbouring professional fields and

government research programs into medicine, public hygiene and social work, promoted the interlinking quantification of health, housing, diet, and family budget that should determine levels of supply and distribution of national wealth (Brown 1997, 246). In this respect, Brigden's idea of economics as the 'Science of the living' came to the fore, worked through the a newly rationalised figure, the 'consumer', which as Nicholas Brown has argued, was 'one of the central formulations of the inter-war period' (Brown 1997, 244). This consumer posited a focal point at which entitlements could be disaggregated and itemised according to specific identities – worker, wife, parent, child – in degrees more diverse than Coghlan's singular indexed 'breadwinner', and more textured than Knibb's 'human unit'.

These intellectual developments reshaped the aims of the Census Bureau. Knibbs had retired as Commonwealth Statistician in 1922 and was succeeded by his deputy, Charles Wickens (1872-1939). Wickens expertise was in vital statistics, and thus perhaps the last of the old guard of statisticians with a view to the 'average man'. In 1924 he was joined by the former Tasmanian Labor parliamentarian and Tasmanian statistician, Lyndhurst Giblin (1872-1951), after the Tasmanian office was subsumed by the Commonwealth Census Bureau. Educated in mathematics and science at Cambridge, where he was likely exposed to Marshall and Pigou, Giblin had become close with Copland and Brigden in Tasmania and was a founding member of the Economic Society. He brought with him from Hobart to Canberra an entourage of talented officers whose degrees in Commerce he had supervised (Forster and Hazlehurst, 1988, 63). He described Sutcliffe's 'an amazing book' (Giblin, 1927), and in a 1930 lecture in his new role as Professor of Economic Research at Melbourne, readily deployed the idea of national income, just as Pigou had suggested, to test (although not enumerate) the impact of shifts in trade, employment and wage policy (Giblin 1930). As the Commonwealth statisticians were drawn into a broader array of distinctly economic affairs – including royal commissions on National Insurance (1923-7) and South Australian finance (1928), in assistance to the British Economic Mission (1928), the report on the *The Australian Tariff* (1929) – estimations of national income were increasingly invoked in debating and testing the claims of consumer-citizens could make on the state. Some of this work might have been siphoned into the proposed US-style Bureau of Economic Research. But the new agency was never implemented, and it fell with the Commonwealth Statistician, leaving an overworked Wickens to suffer a cerebral seizure in early 1931. In Wickens' place, Giblin was appointed Acting Commonwealth Statistician, at a moment when he was also given the title Chief Economic Adviser. Giblin's protégé, the economist Dr Roland Wilson – a graduate of Oxford and Chicago and who had come to work at the Bureau in 1932 – was appointed Commonwealth Statistician in 1936. This infiltration of economic expertise into the statistician's office coincided with the Bureau being relocated to Canberra in 1928 and its subsumption into the Treasury portfolio four years later, a clear indication of the statisticians' shifting objectives.

For some within the Bureau, Wickens' was not the only casualty of this increasingly economic-focused workload. John Stonham, a long time servant of the Census Bureau reflected to the Treasury Secretary in 1933 that when the statistician begins to 'meddle with economics ... he is liable to incur political odium and to have his standing as a Statistician impunged' (quoted in Forster and Hazlehurst, 1988, 68-9). This view mirrored Hayter's dictum from fifty years earlier that official statistics ought not be mingled with interferences, and for Stonham, nothing was more contaminating than economics. Before Wilson had even been appointed however, the Acting head, Edward McPhee (Giblin had returned to Melbourne University in 1933) had explained in a letter to the Treasury Secretary the importance of recruits like Wilson, because while 'economic opinions rest largely on statistical evidence, some knowledge of economics is essential in the proper selection of statistical data which should be compiled ... and to the direction of analyses which should be made of that data by the statistical office' (quoted in *ibid*, 69-70). From within the Bureau then, a leading civil servant now echoed Copland's call made a decade earlier to reform statistics from its excessive 'social' and 'discursive' focus to a branch of economic expertise.

These were intellectual disputes that stretched back to McCulloch and Richard Jones a century earlier: what was the proper purview of economics (or political economy) in relation to statistics? What was the distinction between 'fact' and 'theory'? Was the deductive method mere sophistry in the face of inductive observation? Australian statisticians had carved for themselves a distinct and leading identity for the better half of a century in the tradition of Jones and Qutelet. By the late-1920s, in a context of complex federalism and with the onset of the Great Depression, the need for *economic* statistics, depicting an economic nation of consumers, now usurped Coghlan and Knibb's broader projects. The coalition of the business interests supporting new economics degrees in universities, the efforts of Copland, and the infiltration of government departments by the likes of Giblin and Wilson, together reshaped the aims of official statistics. In terms McCulloch might approve, economists wrested that statistics should be put at the service of economic inquiry.

Economic statistics were now marshalled to construct a new conception of the economy. In a short 1930 textbook entitled *The Australian Economy* – what appears to be the earliest use of the phrase – Copland identified a set of integrated processes that constituted this new totalising concept: prices and wages, banking and finance balance of payments and balance of trade, and national income (Copland 1930). Following such lead, the *Economic Record* was increasingly utilised by Copland and Giblin's students to refine calculations of these indicators. Drawing on new US investigations into indexing business activity and the business cycle, they found the existing collection of official statistics to be 'quite inadequate' thereby 'necessitating recourse to unofficial statistics' (Heath and Polglaze 1934, 215; see also, Gifford 1926; Wilson 1930; Mauldon 1933). Wilson's office obliged and overhauled the *Commonwealth Yearbook* to include more accurate balance of payment statistics in 1934, before redefining the procedures for covering agricultural, pastoral and dairy production and mines, and adding a *Monthly Review of Business Statistics* in 1937 (Forster and Hazlehurst, 1988, 72).

As Australian economists became familiar with Keynesian macroeconomics during the 1930s, these numbers provided material to calculate ad hoc national income estimates that were increasingly deployed to examine policy and target markets to aid recovery from the Depression, a full decade before it was officially calculated as part of the Commonwealth budget (Whitwell, 1994, 129-30).

In an important reminder of how the legacies of older intellectual projects can constrain new ones, the invocation of this new measure often came into conflict with the identities and assumptions that had been consecrated during the tenures of Coghlan and Knibbs. For example, in 1935 Treasury used Sutcliffe's estimates to show that the cost of the old-age pension was outstripping the total amount of income the government earned through taxes. Richard Casey, the Treasurer, used this statistic to launch a campaign to replace the pension with a scheme of national insurance, as Knibbs had proposed twenty years earlier (Watts 1987, 11). However, the proposed policy, which would require contributions from workers as well as their employers, was actively opposed in organised working-class protests, who disputed contributions would undercut their basic wage and curtailed their 'right' as 'breadwinners' to claim upon the national dividend (Huf 2018). In this instance, workers continued to see themselves as breadwinners endowed with certain social and civic rights, rather than as consumers stimulating 'the economy' measured by an aggregated national income. In this way, while the inflection of the 'Keynesian Crusade' into Australian economics and statistics from the late 1930s – a story now well-told (Battin 1997; Millmow 2010) – marked a considerable macroeconomic reframing of the Australian discipline, as Brown has noted, it also had to accommodate identities and assumptions that had been instituted in earlier iterations of Australian statistic-making.

Keynesianism, of course, gave new relevance to the plethora of existing economic statistics being generated by Wilson's reorganised office, especially national income as exemplified in Colin Clark and John Crawford's *National Income of Australia* (1938). Yet it took a wider set of political, economic and administrative circumstances for national income accounting to be established as an official technique (Whitwell, 1994). These circumstances aligned with first with the needs of wartime planning and then especially the post-war construction, as Treasury sought to manage inflationary pressures as the nation demobilised. As Watts (1987) has shown, it was in this post-war context that the Commonwealth implemented its commitment to a new suite of social policies and the objective of full employment. It was in achieving these ends, in late 1945, that Herbert Coombs, Director-General of Post-war Reconstruction Department, outlined the extended range and timeliness of statistics required for managing employment and which provided the blueprint for the Bureau to publish, as a supplement to the 1945 budget, the first official national income accounts. The consumer was now elevated as the centrepiece of economic planning. Bureaucrats, economists and experts were faced with managing a subject who, on the one hand, was to be governed in respect to overall economic aggregates, but on the other, was being conceptualised as a liberal citizen occupying a private sphere of consumption and self-interest, or selfishness, to recall Brigden's original anthropology. Mediating between these macro and microeconomics objectives, government devised increasing complex

controls and incentives – rebates, taxes, interest rates – that could regulate private, autonomous action to ends of aggregated national performance. Achieving these objectives also involved innovating new kinds of measures– ‘unemployment’ chief among them – by which individuals were located in the national economy (O’Donnell 2015). During this same period, the economic historian Noel Butlin, who began his career in Coombs’ department, gained access to Coghlan’s private papers and original estimates, which he used to compile quantitative aggregates of public and private capital formation and estimate national income accounts going back to 1822 (Butlin 1953, 1955, 1964; Butlin and Sinclair 1986). Not only had national income become the chief object of contemporary government, but with Butlin, it was also now chief tool of historical interpretation.

As Brown observed, these machinations registered nothing less than a re-education of all those legal and bureaucratic structures which had once assumed achieving ‘*some kind of economy* in the distribution of the “national dividend”’, to the to the common objective ““of managing *the economy*””, now conceived as a largely autonomous entity to be governed in itself, which could be regulated to make available the satisfactions individuals might pursue’ (Brown 1997, 242, 251). New managerial targets were elaborated in the second half of the twentieth century, none more important than American-led measures of national ‘economic growth’ (Collins 2000; Yarrow 2010). This, too, met resistance, as development economists advocated recovering early twentieth-century social indicators that emphasised consumption patterns and individual well-being rather than aggregate accumulation (Macekura 2019). At the same time, it was this same consumer-citizen whose ‘choice’ neoliberals would, after 1970, seek to liberate from the assemblage of the post-wage ‘economy’. We are now some distance from the crude measures of progress first articulated by Archer. Yet one might also sense a reproduction of the same tensions between the human unit and the ‘social organism’, the ‘breadwinner’ and ‘national wealth’, or between the ‘average man’ and ‘colonial progress’, each of which were a function of the capacity of numbers’ to be a technique of both transparency and control.

Conclusion

To leave the story at this point risks imposing the same kind of teleology towards the apparent rationalising projects of national income accounting with which this essay took as its point of departure. But my purpose has not been to necessarily disrupt any of the accepted chronologies of national income accounting – aside from raising questions about how seriously we should take pre-1930 ‘anticipations’ or ‘pioneers’ of this practice – but to enrich our sense of the epistemological contexts created by official statisticians. I have done so by examining in nineteenth- and twentieth-century Australia the development of a series of government projects and concepts – ‘transparency’ and ‘control’; the ‘average man’ and ‘colonial progress’; ‘breadwinner’ and ‘national wealth’; the ‘human unit’ and ‘social organism’; the ‘consumer’ and ‘the economy’. On this reading, we might

conceive that continuities are as apparent as the discontinuities inferred between ‘moral’ and ‘economic statistics’.

What might this story say to accounting, business, organisational or management scholars today, thereby opening new interdisciplinary frontiers? The economic statistics and indicators periodically published by governments today are, of course, used in an extensive array of contexts, including by such academics in framing and interrogating the ‘issues’ that constitute their discipline. For scholars, as for governments, how ‘the economy’ is seen informs what problems need solving, and what constraints are faced. Historicising economic indicators in a local context such as Australia might equip scholars to be more reflexive in drawing on ‘official data’ to frame and analyse ‘contemporary business issues’. This might include asking whether such measurements and data are appropriate in our times of change. As indicated at the beginning of this article, many governments and economists today are questioning the suitability of GDP as a guiding measure of governmental policy design and assessment in an age of human induced climate change, given that GDP does not take into account the environmental impact of production, and often encourages or rewards environmental damaging activity (Stiglitz et al 2012). By engaging in the kind of historical work suggested here, business and management scholars might similarly critically self-reflect on the forms of quantification employed to design and assess their projects.

At the same time, we must resist throwing the baby out with the bathwater. As noted at the outset, many of the recent efforts to historicise ‘the economy’ have often been loaded as a critique of contemporary neoliberalism. Yet, as Quinn Slobodian has reminded, it was mid-century neoliberals themselves, Hayek first among them, who more than half a century ago identified new talk of a measurable economy as an artificial construction that risked dangerous, illiberal and technocratic interventions. As we have seen, this was indeed the point: the economy emerged as tool for projects in redistributing the ‘national dividend’, a project many critics historicising the economy would generally be sympathetic. Following a longer tradition of statistical-scepticism in Austrian economics, neoliberals preferred only measuring the instantaneous movement of stock and commodity prices as the only reliable form of economic data (Slobodian 2015, 327; 2018, 88-90). Accordingly, today the economy is represented as much in terms of shifting shareholder value and nightly finance bulletins of the Dow Jones as it is GDP. (La Berge 2015, 196). Price and wage indexes remain central to governmental calculation, but as Thomas Stapleford has shown, these have long since been re-routed towards projects of ‘growth’ rather than Coghlan or Knibbs’ concern for ‘distribution’ (Stapleford 2009, 293-381). Recovering this history, says Slobodian, show we might need more economy, not less.

What is perhaps most apparent in wading through this corpus of quantitative work is the tendency for government-by-number to persistently constitute and reproduce tensions between agency and determinism – in this last, neoliberal case, between the investor and the market – and unresolvable oscillation between transparency and control. This historical insight might especially

give contemporary scholars moment for pause. Recovering and contextualising the projects of figures like Archer, Coghlan and Knibbs, reminds us of the fragility of intellectual and political projects that invoke number, the very thing that is supposed to make the world stable. This is as true for the inventors of GDP, as it is for Coghlan, or for William Petty. Whether it marks a measure of intellectual progress, or lost insight, depends on how one wishes to quantify it.

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Notes

¹ See at length: SANSW: NRS 1287, 4/7582.5; and, SANSW, Colonial Secretary, NRS 906, Colonial Secretary's Special Bundles, [4/722.2], "Blue Books, Preparation and Returns".

² For example, see: SANSW, NRS 1287, [4-7258.5], Magistrate at Dungong to Colonial Secretary, 23 June 1852; SANSW, NRS 906 [4-7488], Port Phillip Superintendent's Office to Colonial Secretary, 23 April 1844. A magistrate at Murrurundi complained that 'parties' in his district had sent their returns both to him and Tamworth, making it impossible to obtain the necessary information'. SANSW, NRS 906 [4-722.2].

³ In 1846, Thomson forwarded to the Secretary of State 'A Comprehensive View in a Tabular Form of the Statistics of New South Wales', which on a single sheet detailed all the head of the Blue Books from 1836 to 1844. See: Drafts and final version in SANSW, NRS 1287, [4-6288]; (Watson 1914-26, 24: 707).

⁴ He also rearranged the NSW *Statistical Register*, which Rolleston had not changed in format between the early 1860s and 1885 and had included chapters on Religion, Education and Crime; Trade and Commerce; Mills and Manufactures; Monetary and Financial; Production; Miscellaneous. Coghlan initially expanded to eight chapters and expanded in 1889 to 14. The same statistics were to be found in the *Statistical Register* and *Wealth and Progress*, only the latter made a much greater interpretative effort.

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