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South Australian press coverage of the debate on the climatic influence of forests: 1836-1956.

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Introduction

The origins of the notion that forests could attract rain date back to classical antiquity (Glacken 1967), but in the mid-Nineteenth century the idea became elevated almost to an article of faith among many European scientists in the fields of agriculture, botany and forestry. They were imbued with a new-found appreciation developed during the late-Eighteenth and early-Nineteenth centuries that the Earth was old yet dynamic and that environments, including climate, could change – both naturally and through human agency. The debate on the climatic influence of forests quickly spread to the New World, first in North America and later throughout Australasia particularly with the advance of the agricultural frontier and its attendant assault on the forests. Initially the focus was on the consequences of large-scale removal of trees in heavily-timbered arable lands. Later, attention turned to the possibilities of ‘climate making’ through afforestation both to redress deforestation and to extend the supposed climatic benefit of trees to grasslands. The latter seemed especially important in drought-prone Australia. More than just another scientific controversy or a commentary on contemporary environmental destruction, the notion that trees directly influenced climate also became a familiar historiographical trope in literature as diverse as history, geography and travel-writing to help explain the rise and fall of some civilizations in now arid lands in the Old World. The fledgling sciences of climatology, forestry, and ecology provided further legitimacy in the 1860s to what has been termed an ‘awakening to forest conservation’ through which the various values of forests were considerably prioritised in public policy agendas. Much of the concern with ‘forest influences’ (or more narrowly ‘landscape meteorology’) would have remained the almost exclusive province of the Philosophical Societies, scientific journals, and a few narrow monographs, were it not for the role of the popular press. Throughout the next century, newspaper coverage of the debate transformed the issue into one of the most persistent and contested environmental issues, and elevated the dispute from dusty scientific annals to vibrant popular folklore. The material presented below deals primarily with the role of the press in shaping and communicating ideas and how these can, in turn, be projected into the political arena and public practice. However, the debate also highlights how societies interpret environmental change, variability, and anthropogenic disturbance. Specifically, this research is a case study of the engagement of the South Australian press with the debate on the climatic influence of forests, but it also relates to the issue of how contested questions are resolved, if at all, as well as the broader role of science in society.

Sources and Method

The primary source material was obtained from a total of all 85 variants of 50 South Australian English-language newspaper titles, from the period 1836 to 1956, stored in the Australian National Library 'Trove' digital archive as at June 2015. The titles were published in a total of 27 different communities across South Australia. Four of these communities comprised multiple newspaper titles: Adelaide (17 titles), Port Adelaide (3), Port Augusta (2) and Port Pirie (2); the other 23 communities were represented by a single newspaper title. The newspapers range from the major large-circulation metropolitan dailies (including the various morning, evening, and weekend editions of the powerful Adelaide *Register* and *Advertiser* groups) to the gamut of provincial and small town newspapers typically published weekly or twice or thrice weekly. Collectively, the newspapers represent all South Australia's major economic interest groups including copper mining, viticulture, cereal cropping, general agriculture, pastoralism, manufacturing, ports and rail centres as well as both irrigated and non-irrigated lands; and geographically cover urban and rural areas across all of the settled districts.

These newspapers were searched using two search strings: 'climate + forest' and 'trees + rain'. The resultant hits from the four root words and their combinations returned many hundreds of thousands of items, and the text of each was manually checked for relevance to the debate on the climatic influence of forests. Only those items with direct statements about the issue were incorporated into the main computer database for the research. The two primary searches returned the full text of 700 directly relevant items, of which 86 per cent were from the 'climate + forest' search. A range of variables was noted for each item: newspaper title, location of publication, word length, page number, and type of item (editorial, sub-leader, article, letter, regular column, transcript, correspondent's piece, extract – including the name and location of any cited original source, etc). In addition, a record was kept of any cited authorities as well as any mention of locations where deforestation or afforestation were claimed to have had, or not had, a climatic impact. For each of the 700 items, a simple mutually-exclusive categorisation was assigned as to the stated position in the debate: 'Pro' where the contention that forests influenced climate was stated; 'Anti' where the proposition was refuted; and 'Mixed' where there was any expression of doubt, contradiction, confusion, or differentiation (e.g. by cause, location or scale). Analyses were done by year, newspaper title, and location. The database facilitated the compilation of statistics on each variable as well as mapping and graphing to assist historical-geographical analyses of the press coverage. This included an examination of origin and duplication of items and the pathways and timing of this process e.g. through reprinting or partial extraction. Where relevant, the original sources cited in the newspapers were compared with quotes and summaries derived from them. For contextual purposes selective annotated chronological full text indexes of the press coverage were also constructed including climate, climate change, climate variability, artificial rain-making, forests, forest conservation, forestry, Australian Forests League, tree planting, and some key aspects pertaining to settlement such as Waste Lands Bills, water conservation and irrigation. The methods incorporated here are similar to those used in my previous research on this issue elsewhere in Australia and New Zealand (Legg 2014, 2015a and b). Finally, to inform this research, the political and legislative framework for wider issues regarding the history of forest conservation and forestry in South Australia before 1940 is sourced primarily from Legg (1995).

Overview

Figure 1 indicates the total number of items each year during the study period (see inset), while the main graph distinguishes items per year on the basis of position in the debate. The total number of items increased slowly and falteringly in the decade after the mid-1850s – there being no direct references in the South Australian press between 1836 and 1855 (although the matter had been broached in newspapers during that early period elsewhere in Australasia: Legg 2015a). A steep rise occurred during the late 1860s, then became prominent in 1870. Moderate fluctuations in coverage occurred during the 1870s until the peak of over 50 items per year was reached in 1882. Coverage of

more than 20 items per year occurred in only three years thereafter: 1885, 1889, and 1899 after a notable absence of coverage during the economic depression of the mid-1890s. Apart from a couple of small outliers of around a dozen items per year in the periods 1908-10 and 1914-15, the annual coverage was in single figures from 1891 until the end of the study period in 1956. In summary, the coverage was episodic but remarkably persistent, lasting more than a century, despite the overall decline after the early 1880s. Furthermore, the graph is reminiscent of the classical right-skewed line associated with most public debates in the issue-attention cycle. Assuming stability in the initial conditions, there is typically an initial growing awareness stage, then rapid take-up followed by a plateau as debate deepens and broadens to encompass contrary opinions, and a persistent but declining 'tail' thereafter as both the producers and consumers of the idea gradually lose interest.

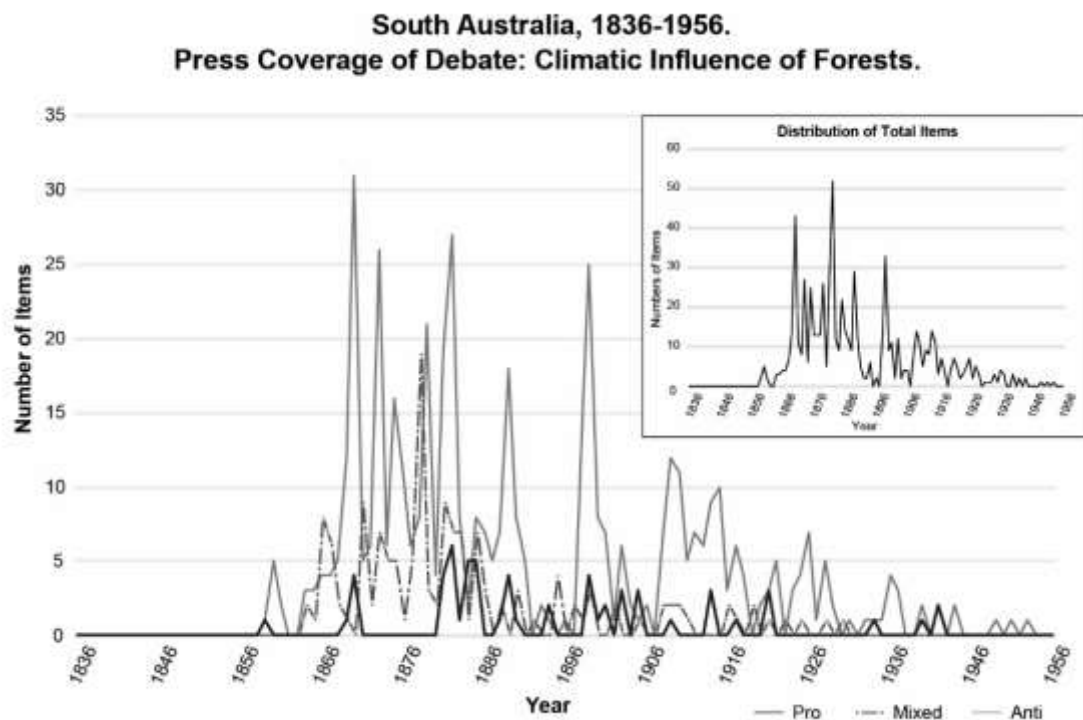


Figure 1: South Australia, 1836-1956. Press Coverage of Debate: Climatic Influence of Forests.

The categorisation details revealed in the main body of figure 1 are remarkable given that all three positions (Pro, Mixed and Anti) were broadly contemporaneous with each other. Clearly, the Pro position was dominant with 70 per cent of all items supportive of the notion. The Mixed position comprised 21 per cent of total items, and was particularly prominent during the 1870s and 1880s, in part as a conceptual transition between the earlier simplistic statements that 'trees attract rain' toward more complex assertions. The latter included forests having various impacts such as increasing or maintaining humidity and condensation or equalizing regional and temporal variations in precipitation. Other complexities in the Mixed position included acknowledging that differences in rainfall between forested and non-forested areas varied seasonally, that scalar differences occurred between micro-climatic, local, regional and broader impacts (occasionally continental but rarely global), and non-linear variations in processes including claims that deforestation could reduce rainfall, but afforestation would not increase rain (or vice versa). The source, nature and chronology of these views will be outlined below. Collectively, the Pro and Mixed positions meant that 91 per cent of all 700 items published during the study period were broadly supportive of the idea that forests had at least some influence on climate. Moreover most of these assertions were tied to an advocacy of the benefits of forest conservation – both native forest preservation and the organised planting of trees. The Anti position represented only 9 per cent of total items. These were often, but not always, associated with the views of proponents who felt burdened by existing forest cover or threatened by attempts to increase it. Notable exceptions did occur however, with some of the most strident items

in the Anti category being penned by strong advocates of forest conservation. Finally, it is significant that scientists were among the proponents of all three positions, although as will be explained below there was increasing differentiation over time in both the field of science from which assertions were made, as well as a widening gap between scientific and popular views in general. Thus, Figure 1 reveals a remarkably contested debate throughout, although as will be revealed below the debate changed qualitatively after the 1914-15 revival.

Geographies of concern

The Adelaide papers represented 33 per cent of the titles who published at least one item in the debate but 80 per cent of total items, mainly because of their larger frequency of circulation, larger number of titles, and greater commitment to engage in the debate. The latter included, at least before 1916, a much stronger activist position on forest conservation in which the climatic influence of forests was viewed as having great strategic value. For example, Adelaide's morning daily *Register* and its sister papers the afternoon *Evening Journal/ News* and their rural arm the weekend *Observer* shared a common editorial stance. Although strongly conservative, the *Granny* (as the *Register* was known) and its counterparts exemplified and dominated the 'progressive' Pro position and were the most powerful and persistent mainstream press advocates of forest conservation in South Australia. The *Register* company also published the monthly journal *Field and Garden* which, although not included in this survey, was among Australia's strongest press advocate of the Pro position in the forest influence debate and was excerpted widely throughout Australia, New Zealand and beyond. Important links in the *Register* chain of newspapers were made by *Field and Garden's* editor/ proprietors Edward Andrews, who later became editor of the *Register*, and Albert Molineaux later appointed Agricultural Editor of the *Observer* 1888-1902. Molineaux was a major contributor on forest issues to its sister newspapers, and later editor of the *Journal of the Bureau of Agriculture* 1894-97. Other notable *Register* forest conservation sympathisers included owner/chief editors John Howard Clark (alias 'Geoffrey Crabthorn') 1870-78 and especially Sir William Sowden (1899-1922). Molineaux and Sowden dominated press engagement in the forest influence debate in South Australia in the late Nineteenth and early Twentieth centuries respectively. They played central roles in forest conservation activism. Molineaux became a long-serving General Secretary of, and journal editor for, the Central Agricultural Bureau and a member of the Arbor Day Committee. Sowden led the Wattle Day League, Australian Forest League, South Australian Institute, and was prominent in the pro-conservationist Australian Natives Association. Both men were leaders of complex advocacy networks. Molineaux was central to the old guard of advocates whose views he championed through the *Register* chain: particularly Botanic Gardens curator Dr Richard Schomburgk, Surveyor-General George Goyder, botanist, parliamentarian, and later Agricultural Bureau chair Friedrich Krichauff, South Australian museum naturalist Otto Tepper, Conservator of Forests John Ednie Brown, and a host of other tree planting supporters including George Angas, Carl Muecke, George McEwin, Samuel Davenport, and Colonel B.T. Finnis. The latter two, along with Goyder, Schomburgk, Krichauff and Brown were members of the short-lived expert Forest Board 1875-82 whose independence was sharply curtailed to allow greater political interference under what became a long period of control by the Commissioner of Lands through the newly-formed Woods and Forests Department (Legg 1995). Molineaux and his close ally Friedrich Krichauff used the Central Agricultural Bureau and Arbor Day Committee to mount a desperate but belated campaign to promote the forest influence idea during the 1890s and especially in 1902-03. Molineaux also maintained productive links with South Australia's German-language press, especially with Adelaide-based *Australische Zeitung* proprietor/editors Dr Carl Muecke and his son-in-law agricultural reformer, local politician, and parliamentarian Peter Basedow (SA Memory 2009). Muecke contributed articles to his own paper and the *Register* group on forest conservation and supported the contention that forests influenced climate. Muecke's second wife Caroline was Schomburgk's sister, part of a complex network of professional and personal relationships that linked many of the German-trained scientists (often with a common botanical training) and journalists in mid-Nineteenth Century South Australia – including Schomburgk, Tepper, Krichauff, and Dr. (and later Baron) Ferdinand von Mueller.

The press baron Sowden was politically much more powerful and socially prominent than Molineaux – or any of the other advocates for that matter. Sowden became arguably the dominant forest conservation activist of the period after the Great War, particularly chairing the South Australian branch of the Australian Forests League 1922-23 and 1925-30. However, his influence was greatest at a time when there was declining legitimacy in the notion that forests affect climate. Individual members such as the elderly Otto Tepper continued an almost lone advocacy of what the press occasionally described as ‘climatic tree theory’ in the League’s early years despite the idea losing much of its traction in the press, Philosophical Society and Agricultural Bureaux. There was even less support in parliament especially following the loss of Adelaide’s parliamentary monopoly. That was due to the ascendancy of localised (rather than absentee) agricultural interests in the Lower House from the mid-1880s, compounded by the decline of the copper-mining interests who had earlier been among the most powerful stakeholders interested in maintaining local native timber and firewood supplies (Legg 1995). In 1922 Sowden retired from his editorship, and relinquished ownership of the *Register*. Losing much of its influence to its rival the *Advertiser* during the 1920s, the *Register* empire was eventually taken over by the Murdoch newspaper group and a few remaining staff transferred to the *Advertiser*, whose owner and rival press baron Sir Langdon Bonython was also briefly chair of the Australian Forests League (AFL). The South Australian branch of the AFL was formed in 1913, and was active until 1915 before being curtailed by the war. The AFL was revived through the 1920s by a new guard led by Sowden, Bonython, forestry lecturer Hugh Corbin, geology professor and retired explorer Sir Douglas Mawson, Flora and Fauna Committee chair naturalist Captain S.A. White and prominent lawyer and ex-parliamentarian John Vaughan. Links with the central Agricultural Bureau and the League were maintained by AFL member H. J. Finniss who had been the Bureau’s General Secretary and Librarian as well as editor of the *Journal of Agriculture*. Lady Mary Eleanor Symons was instrumental in the formation of both the Wattle Day League (from 1910) and the AFL (from late 1912) with which it was closely allied, and she was a prominent member of both leagues through to the 1930s. The AFL lapsed during the Great Depression but was briefly revived in 1937-38. The Adelaide *Advertiser* chain continued to publish items on the forest influence debate until the end of the study period, even under the ownership of the Murdoch group from 1929 – but the articles were few and far between, and often more of curiosity value than serious political pieces including a few references to late-1930s afforestation schemes in both the USA and USSR. The *Advertiser* claimed to be ‘tolerably certain’ of the climatic influence of forests in December 1915 but its confidence declined considerably thereafter. As with most of the South Australian press after the Great War, doubt was increasingly replaced by silence rather than the middle-ground recourse of the Mixed position.

The *Advertiser* group (*Chronicle* and *Advertiser*) contributed just over a third of coverage of the debate from Adelaide newspapers, and the *Register* group (*Observer*, *Register* and *Evening Journal / News*) just under two thirds. In descending order by far the four major contributors were the *Observer*, *Register*, *Chronicle* and *Advertiser*. Aimed at rural readers, the *Observer*’s contribution of 192 items to the debate is remarkable given that it was only published weekly (between 1843 and 1931). Moreover its commitment to the Pro-stance is shown by the fact that around 65 per cent of the items it published on the debate were printed before Molineaux began his fifteen years as Agricultural editor of the *Observer* in 1888 – the year in which he, and fellow advocates of climatological ‘tree theory’ Brown, Krichauff, Schomburgk and Davenport were appointed to the newly formed Central Agricultural Bureau. By 1913 the Bureau had expanded to include 159 local rural branches, and these were an important forum for the debate.

The selected newspapers elsewhere in South Australia that published nothing on the issue were located in six communities: Angaston, Kingscote, Port Adelaide, Streaky Bay, Victor Harbor, and Whyalla – although it is possible that contributions to the debate were made by their local contemporaries not included in this survey. Figure 2 reveals the positions in the debate across the communities in which newspapers participated. Overall, the Pro position was dominant across most of South Australia, largely because forest conservation or at the very least arboriculture was widely supported in public as a tenet of social progressivism – even though they were widely ignored in practice. Political conservatism was no barrier to this ‘progressive’ conservation advocacy because

large land-owners including pastoralists often supported tree-planting schemes. The slightly more liberal provincial and local papers on the small-farm frontier usually published most opposition to forest conservation. This included the forest reserve system (established largely by Surveyor-General George Goyder from 1872), the Forest Board (established under enabling and amending legislation in 1875 and 1876 respectively), and the attendant restrictions on excision of public forests, especially before the period of greater political interference in forest management after 1878-1882. There was little take-up in the early years of the provision of free trees to private land-owners under Krichauff's An Act to encourage the Planting of Forest Trees 1873, but a re-orientation away from planting forest reserves and toward farmers in the mid-1880s saw considerable expansion of arboriculture – particularly in the drought ravaged north, urged on by Molineaux, Krichauff and Brown (ibid.). The number and success of petitions to excise parts of forest reserves for agricultural purposes rose sharply in the mid-1880s and this compounded the loss from forestry control in 1882 of the 100,000 acres of travelling stock reserves established by Goyder from 1863, a subtle shift away from 'scientific forestry' toward forests in the service of rural diversification to aid primary production, and a reduction in public funding for forestry (ibid.).

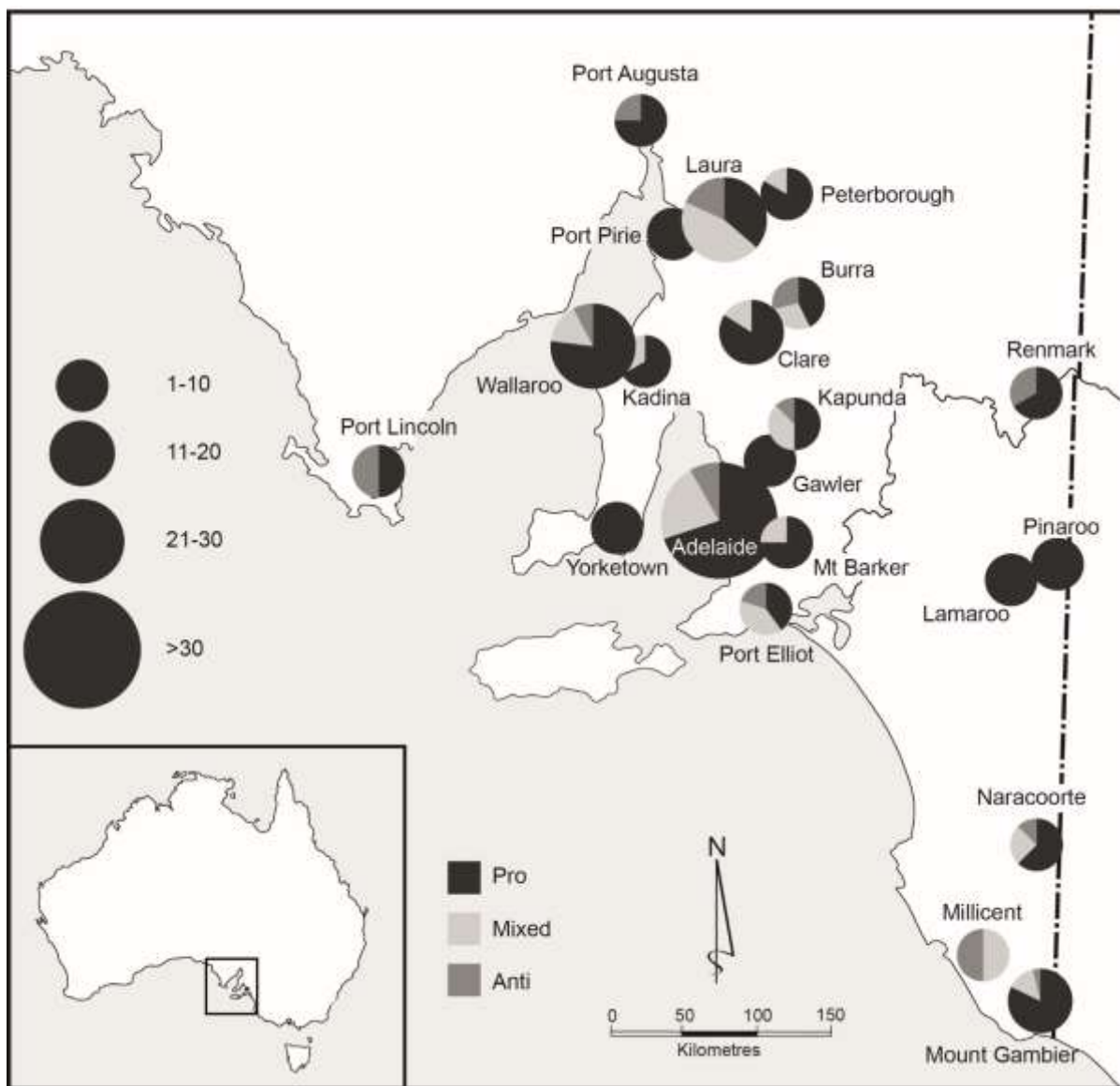


Figure 2: South Australia, 1836-1956. Number and Position of Press Items.

The newspapers that published relatively greater proportions of Mixed and Anti items in the forest-influence debate were located in Burra, Clare, Kapunda, Laura, Naracoorte, Port Elliot and Renmark. Allowing for actual numbers of items published, the most prominent (in descending order) were the *Laura Standard*, *Kapunda Herald*, *Burra Register*, and the *Southern Argus* (formed at Port Elliot and published two years later from Strathalbyn). The broad period covered by most of their Mixed and Anti items was between the late 1880s and 1914. The *Standard's* coverage of the 1889 dispute over the resumption for small-farms of local forest reserves near Laura was the only focussed issue and this included the robust exchange of letters between Conrad Warnum and Albert Molineaux debating opposite sides of the forest influence issue. Otherwise the coverage in these other papers was diverse and often extracted from Victorian and American newspapers.

Sources and authorities

Extraction was a common feature of press coverage throughout South Australia, with many of the smaller rural papers in particular being heavily reliant on syndication (SA Memory 2009). In relation to this debate, this was also the case throughout the rest of Australia and especially in New Zealand (Legg, 2014, 2015a and b). Of the newspapers regularly extracted by the South Australian press, the majority (36 different newspaper titles) came from elsewhere in Australia – 28 from Victoria but less than 4 in both New South Wales and Queensland. Foreign newspapers comprised 28 British titles and 16 from the USA. Between 1 and 4 titles each also came from France, Germany, Ceylon, Mauritius, and New Zealand. Most numerous citations came (in descending order) from the Melbourne *Australasian*, Melbourne *Leader*, Melbourne *Argus*, London *Times*, London *Colonies and India*, and London *Daily Mail*. Many whole, and especially parts of, items were raided without citation – with numerous unacknowledged passages (especially on the Pro side) repeated in newspapers throughout Australasia. Collectively, the heavy dependence on press agencies bringing news items from foreign shores especially in the last quarter of the Nineteenth Century, and the membership of press associations and syndicates throughout the entire study period, ensured common narratives in all three positions in the debate across Australasia. This also guaranteed the relatively cosmopolitan and dynamic nature of the debate in the popular press as well as in scientific circles. The debate in South Australia was more insular than that in Victoria, New South Wales and New Zealand arguably because of the heavy reliance on, and respect for the arguments of, the main local proponents, particularly Schomburgk, Krichauff, Brown, Tepper and Molineaux (and in part their reliance in turn on evidence from Australasia's most prominent advocate Victorian Government Botanist Ferdinand von Mueller). Remarkably, this was despite the early and convincing critiques made by equally well-respected local authorities (and supporters of forest conservation) Surveyor-General George Goyder and Government Meteorologist Sir Charles Todd. Goyder was adamant, from at least 1879, that the association between forests and rainfall was spurious and illogical, and Todd regularly reported through the last 40 years of the Nineteenth Century that South Australia's meteorological records revealed no climate change. Nor could the advocates be swayed by the eloquent writings of gifted amateur critics such as Conrad Warnum, Sir George Kingston, or Malcolm Murray.

Among the more important local factors influencing the debate was the series of severe droughts that crippled agriculture in South Australia during 1865-67, 1880-83, and 1895-1903. The spectre of drought was a common element of the Pro narrative. The first of these droughts devastated wheat crops and livestock in the newly settled Northern districts, especially beyond what became known from 1865 as Goyder's Line - demarcating the limits of reliable rainfall and approximating the 10 inch (254mm) isohyet (Meinig 1962). Although there was widespread agreement on the benefits of moisture-retention and shade created by tree planting, the first drought polarised opinion in the debate, with the Pro side highlighting the opportunities for increased rainfall through afforestation, but critics such as Goyder noting the lack of variation in precipitation across either the scrubs, woodlands, grasslands or non-vegetated lands during the drought. The second drought provided the backdrop for the pinnacle of the total press coverage of the debate and for the second highest peak in publication of Pro items. That drought also influenced widespread local political agitation for water conservation (including research into irrigation) and marked the beginnings of a successful, concerted

and long-lasting campaign by parliamentary agricultural reformers to give greater opportunities to the 'small farmer'. Significantly, by far the largest number of Mixed items was published during this second drought – the earlier strident claims of the proponents of tree theory being watered down both rhetorically and conceptually in the light of growing acceptance that the causes of rainfall and the nature of climate generally were more complex than previously acknowledged. During the third drought, there was a brief rear-guard action by Molineaux, Krichauff and Tepper, and an exchange of letters over the possibilities of using afforestation to avert drought in the recently settled Ninety-Mile Desert. But scientific opinion on the debate had turned significantly, thanks in no small part to two factors. The first was the lack of apparent climatological benefits following widespread tree-planting in South Australia during the 1880s – these included sugar gums, a range of deciduous trees, and in the far North even date palms (Legg 1995). The second, more important factor, was the now prevailing pre-occupation by Australasian meteorologists with the role of astronomical 'forcings' such as sunspot or lunar cycles in regular climatic variability, tempered by large-scale boundary-layer processes such as monsoonal and oceanic influences (Legg 2014). New South Wales Government Meteorologist Henry Chamberlain Russell's 1876-1899 campaign to 'debunk the myth that forests influenced climate' was widely reported in the scientific and popular press throughout Australia and New Zealand – but although cited by local critics, his work received relatively little coverage in South Australian newspapers. Similarly, there was little acknowledgement in the press that authoritative works on Australian climatology simply ignored forests, and indeed human influence, as climatic variables (see for example Professor Ralph Tate's widely-published 1884 Adelaide series of public lectures on Australian Climate, and the standard text Hunt *et al.* 1913). Furthermore, public opinion was being swayed during the 1890s and early 1900s by the panaceas of irrigation and artificial means of creating rain. The latter, through various means including percussion and electricity, had reached a level of interest that the South Australian press described as a 'perfect mania'.

There were many local contributions to the Pro narrative published by the press. These included 1865 articles by Carl Muecke and South Australian ex-patriot Ferdinand von Mueller, and the transcript of C.S. Hare's landmark 1868 paper delivered to the Philosophical Society in Adelaide. The foundations were set firmly in the 1870s with Schomburgk's lectures (1870 to the Philosophical Society, and 1878 to Chamber of Manufacturers), 1873 report on Rural Industries and Forest Culture, and his Annual Reports of the Botanic Gardens; Davenport's lectures to local Agricultural Bureaus (1872 and 1873); Hare's local Agricultural Bureau lecture 1873; Krichauff's 1875 lecture to the Chamber of Manufacturers and his wide-ranging parliamentary speeches on the subject 1871, 1873 and 1875; the release of the 1879 Report of the Timber Trees sub-committee of the Chamber of Manufacturers; and Brown's 1879 Annual Report of the Forest Board along with his report on South Australia's forest reserves in the same year – the first in a long line over the next dozen years of the ebullient Forests Conservator's promotional materials on the climatic benefits of forests. The 1880s saw Brown's widely-acclaimed *Practical Treatise on Tree Culture* (1881), his Report on Tree Planting in the North (1885) and his persistent reminders through the Annual Reports of the Forest Board and later Woods and Forests Department. Schomburgk's Annual Reports of the Botanic Gardens maintained the Pro line, especially his almost indignant Appendix to the 1882 report. A series of articles on forest conservation and forestry penned by Molineaux appeared in 1885 and 1889 (the latter railing at political interference in the forest reserves under the not-so subtle pseudonym 'An Enemy to Forest Destruction'), but it was the approximately three dozen authors of Letters to the Editor who led the debate during the 1880s. A couple were written by 'experts' such as Molineaux and Krichauff but the vast majority were lay contributions covering all sides of the debate. The 1890s press published a few lectures to local Agricultural Bureaus (including the works of Molineaux, Watson and Noll) and letters from a couple of dozen authors (including the implacable Otto Tepper) – but the debate was diminished by Brown's 1890 departure to the New South Wales Forests Conservatorship, Schomburgk's 1891 death, and Krichauff's 1893 retirement from parliament. Tepper's 1898 Royal Society paper was the last major direct contribution to the debate widely-publicised in the local press. After the turn of the century, and especially after 1915, there was little input to the press on the debate by local authorities, although a few like Tepper, Mawson, and McNamara still resorted to brief and incidental references to the climatic benefits of forests. The debate was however maintained by

lay contributions in the form of Letters to the Editor from about two dozen different authors, and notably from the various participants to annual Arbor Day celebrations – both in the recorded speeches by local officials (predominantly teachers and local politicians) and in prize-winning essays.

Although there was a gradually increasing reliance on local expertise (especially in the field of climatology and meteorology), participants in all three positions on the forest influence debate relied heavily on non-local authorities i.e. other Australian and especially foreign. A number of factors contributed to this phenomena, which was itself typical of most aspects of colonial and early-national life in Australia. These included a pervasive cultural cringe, the almost universal use of syndicated extracts through news agencies and press associations, a reliance on historical records of anthropogenic disturbances and climate change then to be found only beyond Australian shores, a dependence on foreign scientific qualifications and institutions to legitimise standing in colonial science, and even a convenient attraction to the exotic which was alluring partly because of the difficulty in contradicting impressionistic assertions. The latter was particularly important when building aspects of the Pro narrative that was built on essentially historical approaches that noted strong positive correlations between deforestation and the decline of agrarian civilizations in many parts of the Old and New Worlds – the former especially in the Middle East, around the Mediterranean, and in North Africa, and the latter in South and Central America. More recent evidence was cited for various Indian Ocean islands and especially for India, where the correlation was deemed to be more specifically with drought. These locations were imprecise, as were the time periods given, and there was rarely much attention given to scale or boundary issues. These historical assertions were often accompanied by scientific or pseudo-scientific explanations of the various physiological and chemical processes deemed to explain how forests influenced climate. These explanations were centred in the fields of agricultural and botanical sciences, and at least initially many colonial meteorologists (including Victorian Government Meteorologist Robert Ellery and his Queensland counterpart Clement Wragge) were sympathetic to some of these assertions. Even the work of the South Australian and other Australasian experts participating in this debate were often judged by their articulation of foreign expertise. This was no less the case in the press, where many editors strove to use incontrovertible evidence and clear logic to support or critique what were otherwise merely opinion pieces.

Among the external ‘experts’ most regularly cited by the South Australian press in the debate during the 1860s and 1870s were (in descending order of frequency): French chemist Jean-Baptiste Boussingault, French physicist Antoine Becquerel, Victorian Government Botanist and Melbourne Botanic Gardens curator Ferdinand von Mueller, French forest meteorologist M.M. Fautrat, American philologist George Perkins Marsh, Scottish forester John Croumbie Brown (uncle of Forests Conservator John Ednie Brown and his brother Professor William Brown who later headed agricultural colleges in Victoria), New Zealand Forest Conservator Capt. Campbell Walker, American forester Franklin Hough, NSW geologist Rev. William Clarke, German geographer Alexander von Humboldt, Danish Botany professor J.F. Schou, and Victorian bureaucrats Clement Hodgkinson, Charles Ligar and Robert Brough Smyth. A few citations to other continental scientists were also made during this time largely channelled through the works of Schomburgk, Clarke and Krichauff. In later years the number of cited authorities was much reduced, and significantly those experts came increasingly from advocates of the Mixed and Anti positions. Among the prominent authorities cited in the 1890s in support of the forest influence thesis were British-based Forestry Professor William Schlick, Indian forestry chief Berthold Ribbentrop and Victorian Forests Conservator George Perrin (the latter who had earlier worked as a forester in South Australia under Brown). The inconclusively complex field results of German forest meteorologist Karl Ebemayer were conveniently cited as support by participants on all sides of the debate, but NSW Government Meteorologist Henry Russell was taken as perhaps the clearest critic on the Anti side. It is worth noting that on all sides of the debate material cited was often very selectively quoted. Comparison with many of the original sources shows that works cited in parliament, public lectures, and the press often ignored silences, contradictions or complexities, albeit mainly for brevity and impact rather than wilfully (Legg 2014).

In 1911 American Forestry Professor Bernard Fernow criticised the ‘climatic influence propaganda’ used by conservationists – but press reviews ignored that aspect of his work (and see Legg 2014 on Fernow’s earlier prescient analysis of the apparent intransigence in the debate). The press made fleeting references to the Pro position of Victorian State Rivers and Water Supply chief Elwood Mead and visiting Japanese forestry expert Mr Tanaka (both in 1912). Intellectual ‘duels’ on the debate between foresters and meteorologists at British Association for the Advancement of Science meetings were eagerly reported in 1927, but there was little coverage on the issue from the 1914 meetings held in Australia. Victorian Professor of Botany Alfred Ewart (1914) and Victorian and Commonwealth meteorologists Henry Hunt (1909-1914) and Edwin Quayle (1921) were all reported to strongly oppose the notion that forests influence climate – although Hunt was initially equivocal. Quayle went as far as to effectively resurrect the old theory that ‘rain follows the plough’ in Mallee scrub, much to the chagrin of conservationists. Despite indifference from mainstream science and an almost complete rejection of the forest influence thesis by meteorologists long before the 1930s, the South Australian press did little to offer the public a sense of closure to the debate. After the Great War, however, public and press attention shifted toward the economic potential of the government’s reorientation of forestry away from the arid north toward grand softwood afforestation schemes in the humid Central and South eastern districts (Legg 1995).

Voicing opinions

Two particular elements of the press coverage potentially give more direct representations of the opinions of the press and public – editorials and letters to the editor respectively. Of the total of 700 items, only 40 editorials were penned. Of these editorials, two-thirds supported the Pro position and the remaining one-third the Mixed position. The bulk of these were written in the period between the late-1860s and mid-1880s at the height of the debate, and there were two smaller outliers: 1889 during the bitter struggle over political control of the forest reserve system, and between 1908 and 1921 during three separate minor revivals. About half of these editorials came from the Adelaide press, 7 from the Clare *Northern Argus* and 3 from the Mount Gambier *Border Watch* – only six other papers contributing between 1 and 2 editorials each. There were over 130 of the more vaguely defined ‘sub-leaders’ almost all of which were, as with many of the editorials, republished in one form or another in other South Australian newspapers (and had often been obtained from the press elsewhere throughout Australia and New Zealand). This exchange peaked during the 1870s, early 1880s and in 1899. Both editorials and sub-leaders often misleadingly claimed to be the exclusive opinion of that particular newspaper’s editor. Items in every category (editorial, subleader, regular column, etc.) generally had their length and content varied when reprinted in other newspapers. Certainly the choice of what, and what not, to print was itself evidence of editorial stance. In contrast to strong editorial positions found elsewhere in parts of rural New Zealand and in Victoria’s Gippsland (Legg 2015b and 2015c respectively), and apart from the occasional piece in the Laura *Standard* and Clare *Northern Argus*, editors in South Australia’s rural press were generally equivocal on the debate and far less committed than those from the Adelaide papers. Furthermore, there was little to suggest any strong economic or environmental determinism influencing editorial stance. Notably, there were no editorials on the matter published after 1921 – an indication of how far the contention that forests influence climate had waned as a strategic issue.

On 172 occasions Letters to the Editor referring to various positions in the debate were published, all between the years 1864 and 1944. These were penned by 75 different authors, who collectively contributed 105 original letters (67 of these being reprinted in the surveyed press). There were nine individuals who contributed multiple letters: in descending order of magnitude these were White (1877-92), Tepper (1882-96), Molineaux (1899 and at other times under pseudonyms), Warnum (1899), Finnis (1882), Murray (1899), McEwin (1873), Thomas (1882), and the not so cryptically named ‘Erutan’ (1888-89). The Adelaide press published 92 per cent of the total number of letters, with the Laura *Standard*’s five letters prompted by the excision of nearby forest reserves being the next largest. On five occasions there were robust exchanges on the debate between opposing contributors. Of the total number of letters, 53 per cent were Pro, 30 per cent Mixed, and 16 per cent

Anti. This suggests that a much higher proportion of dissenters, or at least doubters, used the opportunity to express their opinion through letters than was the usual fare of press coverage. Even from distant communities, letters tended to be sent to the Adelaide papers. The fact that letters were still being published more than twenty years after the last editorial on the debate suggests that the public remained curious and divided long after editors and politicians had lost interest.

Conclusion

The South Australian press worked closely with, and indeed counted among their own, passionate campaigners who wanted governments and private landowners to apply climatic 'tree theory' to environmental management. Nevertheless, the editors were more adaptable to the shifting ground in this debate than their initial gushing advocacy might otherwise suggest. Their persistent support for forest conservation was tempered after the 1880s by a growing realisation that there were intractable problems with the historical approach and the attendant logic used by those who believed that forests influenced climate. Furthermore, the press began to acknowledge the continual lack of substantive empirical evidence of climatic change following alterations to vegetative cover. As the Mixed position expanded, the rhetoric of the Pro position narrowed and became even more circumspect. Eventually the press gave increasing attention to other benefits of forests including the conservation of moisture, soil and wildlife. The passing of the old guard of local activists between the 1890s and 1920s saw the demise of their dream that forests could attract rain and secure the World from drought – but their deep belief that humans could change the Earth for better or worse remained.

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