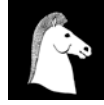




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Histories of Forestry: Ideas, Networks and Silences

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SUMMARY

Professional German foresters have had a significant impact in many parts of the world. While this impact is acknowledged in India, Canada and the USA, it appears that many histories of Australian forestry are Anglocentric, spatially and temporally constrained, and unaware of the travel of ideas which underpin forestry practice. This article compares Australian and Canadian forestry histories, with particular reference to New South Wales and British Columbia respectively. It uses a modified form of Actant-Network Theory to look at the construction of Nature as part of the evolution of forestry, and to investigate the movement of ideas that underpin forestry in Australia and Canada.

INTRODUCTION

Much has been written recently about forestry in India (Rangarajan, 1994; Sivaramakrishnan, 1995; Saldanha, 1996). This work acknowledges the importance of German forestry ideas. These ideas, and sometimes the people who held them, were also imported into England where, even as late as 1885, there was no school of forestry. The connections with America and Canada have been explored by numerous authors (including Clepper, 1971; Rogers, 1991). However, it appears that these connections are understated in the histories of Australian forestry, although a recent paper (Dargavel and McRae, 1997) identifies their importance.

This current article establishes the existence of these connections and highlights some of the important differences in forestry histories between Australia (in particular the state of New South Wales) and Canada (with particular reference to the province of British Columbia). In doing so it overcomes some of the limitations discussed below of forestry history, particularly in Australia.

The connections involve Germany, France, England, Scotland, India, Burma, the USA, Canada and Australia. These connections are explored through the adaptation of Actant-Network Theory, derived from the sociology of Bruno Latour, John Law and Michel Callon. While recognising the omission of other Southern Hemisphere countries such as New Zealand and South Africa from this analysis, it is argued that these countries constitute a particular history in their own right, not as a homogenous Southern Hemisphere translation of Northern Hemisphere ideas.

This article begins by looking at the types of histories written about forestry in Australia. I am viewing forestry history as a sub-section of environmental history. Dovers (1994) covers the range of environmental histories in Australia. However, part of my argument is that forestry history in particular, and often environmental history generally, cannot be confined to a particular construct such as a state, e.g. Australia, or as Griffiths (1993) argued, a bioregion. In this paper I demonstrate that the ideas that have influenced forestry history in Australia have been translated from other locations, particularly Germany.

Actant-Network Theory is introduced as a potential approach to demonstrate how the translation of ideas has occurred. However, despite the strengths of Actant-Network Theory, this article identifies some theoretical problems that need to be addressed. By doing so, it is then possible to develop a Modified Actant-Network Theory, which is used in this paper to trace the origins of German forestry ideas through India, across to North America and to the specific forestry histories of British Columbia and New South Wales.

Actant-Network Theory also overcomes some of the limitations discussed in the first section of this article. As a theoretical approach, Actant-Network Theory has potential to decentre anthropocentric versions of history, although in this current paper I am looking at the history of forestry administration, not the history of forests. The importance of decentring anthropocentric versions of history has also been recognised in environmental history by Griffiths (1993) and in anthropology by Ingold (1995). Finally, some similarities and differences are noted in the early histories of forestry in Canada and Australia, although a full treatment of this comparison would require a paper in itself.

Dovers (1994) cites two reasons for doing environmental history; that it is inherently interesting and that it enables us to learn more about ourselves. Forestry history that emphasises the origins and movements of ideas, their application, and relationships between discourse and application, has great relevance to contemporary environmental issues generally. In particular, the language of science, and of concepts such as 'sustained yield', have been used interchangeably with the concept of Sustainable Development, an idea that is very similar to the writings of Gifford Pinchot (see WCED, 1987; Wall, 1994). The silence on these links in environmental history needs to be addressed.

FORESTRY HISTORY IN AUSTRALIA

Most versions of forestry history in Australia are temporally and spatially constrained (see Carron, 1985; Dargavel, 1994, 1995; Griffiths, 1992; Hudson and Henningham, 1986, many contributors to Frawley and Semple, 1988 and most contributors to Dargavel and Feary, 1993). Exceptions to this trend include cross-boundary papers such as Roche et al. (1993), Dargavel and McRae (1997) and comparison between different forest regimes (Dargavel, 1989). Many histories do not acknowledge the role of indigenous people in their own version of 'forest management' (Boutland, 1988; Lyons, 1988, Feary, 1988; and Ellis and Thomas, 1988 are among the exceptions). Many histories are also limited to particular states (Grant, 1989; Moulds, 1991), and even those that are inclusive of the entire country generally fail to acknowledge the translation of ideas from outside the area they are studying.

Most versions of forestry history in Australia are Anglocentric. They do not acknowledge the German, Indian and, where necessary, French, influences upon the development of forestry. The approach is different in Canada and the USA where the non-Anglocentric influence is more readily acknowledged. Some notable exceptions to this general case are Pyne (1991), who recognises the German and French influence on Australian forestry in relation to the use of fire, and Lines (1991) who acknowledges the importance of William Schlich's *Manual of Forestry*, published in English in 1894, on the education of foresters in Australia. Johnson (1995, 64) recognised that 'environmental history can have a powerful integrative function in Australian History – and other national histories'. This issue of identity, whether it be local, regional or national, is important because it discourages environmental historians from looking at linkages through privileged spaces, e.g. Australia.

Almost all forestry histories are anthropocentric, as is this current paper. However, many of these earlier histories are strongly anthropocentric (Dobson, 1990) in that they identify the forests with timber and natural resources for human use. They do not see trees as part of an ecological web. They uncritically accept constructions of Nature and natural resources, rather than exploring the processes involved in these constructions.

Why has much, but not all, of Australian forestry history been of this character? I believe it is partly due to the backgrounds of people writing these histories. Some forestry histories, in both Australia and Canada, are written by retired foresters. These histories are akin to reminiscences, although some are taken beyond this stage by the co-authorship of specialist authors (e.g. Mahood and Drushka, 1990). The reminiscences are important because they are often the personal histories as told by people who have worked in a particular field. They often have the strengths of intimacy and everyday familiarity lacking in many academic papers, but they often exhibit the weaknesses of being immersed in a

particular field for many years. They suffer from the narrow vision required for everyday survival in the industry.

Another reason for the limitations discussed above has to do with the commissioning body. This body may be a local town council, a preservation society, or it may be a corporation, e.g. Bunnings Limited (Mills, 1986). These histories are important in particular regions, and in the process of corporate identity construction and embeddedness in communities and regions. However, their silence on travelling ideas is a limitation that needs to be addressed because there are overlapping stories that are not being told in these histories. In order to tell these alternative stories, it is first necessary to explore the theoretical framework derived from Actant-Network Theory.

ACTANT-NETWORK THEORY

The Actant Network Theory of Michel Callon, John Law and Bruno Latour, amongst others, seeks to avoid the perceived problems of structuralist explanations of change processes. This is achieved by situating the author within the network that links various actants (not necessarily humans) and by following these actants as they bring together diverse actants and materials in new relationships. An actant is used by Latour (1988) to mean a force, i.e. an entity that gains strength through its association with others, especially if it can purport to speak in their name. Haraway (1992: 231), quoting Hawkes (1977: 89) notes, 'actants operate at the level of function, not of character. Several characters in a narrative may make up a single actant'.

By situating authorship within the network, the Actant-Network theorist proceeds by following the networks that actants themselves identify. Latour (1996) uses this approach to tell stories about ARAMIS, an idea for a new transportation system in France. Following Tolstoy (originally 1869) Latour identifies what actants said at the time, not in hindsight. Actant-Network Theory has also been used by John Law (1986) to tell a different story about Portuguese navigation and the route to India. I argue that in most instances, this approach contains problems related to the disappearance of authorship. However, Law (1994) overcomes this problem by inserting the author at numerous points throughout his work. I also argue that there are limitations to network perception from within the network. This is illustrated by the history of forestry in Australia. Using Actant-Network Theory, it would only be possible to follow the networks presented below if the actants themselves recognised these networks.

As a theoretical approach, Actant-Network Theory has potential to decentre anthropocentric versions of history. However, in practice it has generally not done so, despite opportunities presented to authors such as Callon (1986) and Callon and Law (1989). In this paper it would have been possible to discuss proposals in 1885 to enrol the *Diodoxus erythrurus* beetle to clear 'scrub' for

agriculture in Australia. While acknowledging the importance of agency for nature, in this article I am primarily interested in the construction of nature by people acting through culture. Therefore, while recognising the potential of Actant-Network Theory to decentre anthropocentric versions of history, this paper on forestry, rather than forest history, is clearly anthropocentric.

Actant-Network Theory also has advantages in that it directs a researcher to see history as dynamic, to see power as being contained in relationships in networks (rather than something held) and to focus on the construction, maintenance and disjuncture of relations. The theory is underpinned by a desire, again from Tolstoy, to undermine the 'great man' approach to history and science. This is achieved by looking at the relationships between one actant (in this case the 'great man', e.g. Napoleon, Pasteur) and other actants. While credit is given to what the hero does achieve, the theory introduces modesty by acknowledging the roles of many actants who have been written from the script in favour of the 'great man'.

Actant-Network Theory crosses spatial boundaries, thereby embodying the potential to tell different stories about forestry to those currently being told. However, most Australian forestry histories do not achieve this. It is possible to cross spatial boundaries, as Roche, et al. (1993) do with regard to the Kauri Timber Company, without explicitly using any form of Actant Network Theory. However, a modified form of Actant-Network Theory is a suitable approach to looking at networks of travelling ideas because of its concepts of power, modesty and the translation, rather than the transmission, of ideas.

Indeed, in some ways the Modified Actant-Network Theory used in this paper is an example of the 'boomerang effect'. Actant-Network Theorists were originally drawing upon Tolstoy's (1869) approach to writing history, and upon the work of the French historian, Fernand Braudel. Latour (1988: 173) wrote, 'My homage to Fernand Braudel (1985) who ... shows how long-distance control may be achieved through tenuous networks'. It is possible to follow networks, but to recognise that as an author I was initially looking to see if such networks did exist. In the Modified Actant-Network Theory it is also possible to step outside these networks to make judgements and to follow the networks which actants at the time do not necessarily acknowledge, perhaps because of Anglocentrism. Even in Actant-Network Theory, there is an implicit tendency to step outside the network. Latour (1991: 130) does not recognise any way to '... accept judgements that transcend the situation', yet Callon (1991: 141) steps outside the network when commenting on 'nucleocrats' as 'terrible nucleocrats'.

COUNTING, CALCULATION AND A NEW LANGUAGE

The Modified Actant-Network Theory is a tool. It enables the researcher to identify the translation of ideas. However, the initial choice of what to explore,

and where to enter the network, involve issues of authorship and value judgements. While it is possible to use a Modified Actant-Network Theory to trace networks and ideas to Ancient Greece and Rome, for the purposes of this article on forestry history the story begins in the eighteenth century. The location is mid/northern Europe, in the empires that later coalesced into the country called Germany.

The separation of thought from feeling was accentuated through the European Enlightenment. It was particularly evident in nineteenth century Prussian and later German intellectual traditions that emphasised rational science (see Radkau, 1996; Tolstoy, 1869). While Germanic *volk* traditions involved trees and forests, which were later to form part of the extreme mind/body split of the Nazi era (Berman, 1990; Schama, 1995), the German concept of forestry was largely based on controlling nature through mathematics and design.

While German forestry practice was not initially derived from the abstractions of mathematics applied to nature, this is in effect what it became. The initial impetus for German forestry practice, according to Heske (1938), was the prospect of a timber famine. This famine was considered likely because population growth, and hence increased demand for wood, was coinciding with soil deterioration from forest exploitation and a loss of communal forests to farmland. Radkau (1996) identified the long recognised need to balance lumber cutting with other activities, such as hunting and firewood gathering. However, Saldanha (1996: 198) believes forests 'deteriorated continuously in Germany until the end of the eighteenth century', and that 'the condition of forests at the beginning of the nineteenth century were said to be 'most pitiable'' (Saldanha, 1996: 199). If so, this would have given greater scope for the development of 'scientific forestry'.

Lowood (1990) suggested that the aftermath of the Seven Years War (1756-63) alerted a small group of foresters and bureaucrats to the plight of German forests. When Frederick the Great was attempting to encourage population growth and expand both industry and trade, this enlightened group realised that if these aims were achieved, the demand for wood would increase. The 'wood famine crisis' is not so much about the amount of available wood to meet existing needs, but rather about the amount of wood needed to meet Prussian, and later German, growth aspirations. Not only was a new scientific type of forestry needed to raise wood production, but a new type of forester was required. No longer was forest administration a suitable placement for military retirees. In 1763 the first forestry school was opened in Germany, a book first appeared with 'forestry science' in its title, and the first journal devoted exclusively to forestry was published (Lowood, 1990).

Radkau (1996) provides an alternative explanation to the 'wood famine thesis. He believes that the wood famine explanation and the degree of degradation may be overstated in Germany, because 'the destruction of the forests was

worst at the sides of roads and rivers where it lay before the eyes of travellers' (Radkau, 1996, 67). He further asserts that the perception of the forester as having a 'very bad public image' in the eighteenth century was transformed into foresters becoming 'one of the highest-esteemed German professions' in the nineteenth century when they were regarded as 'defenders of nature, advocates of the common wealth and of the interest of future generations' (Radkau, 1996: 72). This notion of forestry as 'forestry science' emerges from, in Radkau's (1996: 71) analysis, 'the general high esteem for science in 19th-century Germany which favoured the founding of forestry science'. Interestingly, Radkau (1996: 69) suggests that "'nature" did not play a significant role in the teachings of the founding fathers of German forestry ...' and that 'the absence of "nature" is more remarkable as "nature" was a very popular term in Germany at that time'.

The explanation for this absence is important, because it establishes the model under which 'industrial forestry' in British Columbia, and to a lesser extent Australia, has claimed to operate, i.e. a 'farming' rather than a 'mining' metaphor. Radkau (1996: 69) believes;

generally the great reformers of forestry did not at all like the idea that the forest is a gift of nature; on the contrary, they wanted the forest to become an artificial work of forestry. It is true that the idea that the forester should imitate nature, and adapt forestry to nature, was not wholly absent, but at that time it was considered old-fashioned.

Whether from fear based upon interpretation of actual experience (i.e. the wood famine concept), or Radkau's (1996) legitimisation thesis regarding the role and perception of the forester, the notion of 'scientific forestry' rapidly gained ascendancy in Germany. Lowood (1990) details the various counting procedures used to assess the 'productivity' of a forest for 'harvesting'. This approach increased in mathematical sophistication to the point where large tables not only calculated the volume in an old-growth forest, but enabled scientific foresters to calculate replanting programmes and the stage at which the replanted area should be logged again. However, as Lowood (1990: 329) noted, 'In the German tradition, the mathematician's forest was populated not by the creations of undisciplined nature, but by the *Normalbaum*'.

The *Normalbaum* was a mathematical abstraction. It was necessary to have 'normal trees' in a 'normal forest' in order to develop the concept of Sustained Yield Management. This was a mathematical model of trees of various ages growing and being cut when they reach the 'mature' stage, and the area being replanted to enable growth for future cutting. In this logic, forestry was similar to agriculture with its language of 'harvesting', rather than 'mining' the forest. Nature was no longer seen as wilderness, or unmanaged trees of various ages growing together. Instead, blocks of even aged trees, growing on shorter life

spans than old-growth forests, became defined as 'normal'. This later became extended to the old-growth forests being seen as 'unproductive' unless harvested, and 'decadent' in their growth.

Heske (1938) elaborated a key difference between the original German forestry that developed the concept of Sustained Yield Management and future attempts at sustained yield, including the British Columbian experience. Heske (1938: 38) noted,

German forestry probably affords the only instance where the ideal of sustained management, in accordance with the long-time interests of the people as a whole, was developed before the start of the capitalistic era and, with few exceptions, was unwaveringly followed while the whole cultural and intellectual life was dominated by liberal capitalism and laissez faire philosophy.

This perspective needs to be critically received because '... the early Nazi years in particular presented a favourable atmosphere for the new slogan *naturgemasse Waldwirtschaft*, "forestry according to nature"' (in Radkau, 1996: 69). However, Heske (1938) wrote that 'sustained management' was practised in Germany because most German foresters could not bring themselves to introduce the short rotations required with the later idea of Soil Rent Theory. Soil Rent Theory viewed wood not as an essential material to be carefully managed, but viewed trees as money and their life-span as 'renting' the soil. According to Soil Rent Theory, the trees should be replaced when economically possible, to obtain capital increment and to enable the planting of another crop of trees. This latter notion is, in effect, what Sustained Yield has come to mean in areas where the old-growth forests have been logged.

'THE FINEST FOREST DEPARTMENT IN THE WORLD'

How did these developing ideas of forestry travel from Germany? Modified Actant-Network Theory is useful to explore this question. While it is possible to trace the origins of 'scientific forestry' or 'systematic forestry' to the 'founding fathers of German forestry, such as the triad of Hartig, Cotta and Hundeshagen' (Radkau, 1996: 69), I begin with one of the most famous German foresters, Sir Dietrich Brandis. He was the giant Muller in Rudyard Kipling's *Jungle Book*, 'the Lord and Master of all the forests and woodlands of India, the Chief Ranger whose domain stretched from Burma to Bombay ... as a forester he had no peer' (Saldanha, 1996: 195). However, in this history, the element of chance was crucial. Brandis was appointed to Pegu at the suggestion of his wife's sister's husband, General Sir Henry Havelock (Lee, 1912). Later the boat carrying Brandis' botanical library sank in the Rangoon River, which encouraged Brandis to concentrate on forestry, rather than botany, for a time.

This story does not trace all actions to a 'great man', but enters a network through Sir Dietrich Brandis to demonstrate some important networks that did exist. Brandis was born in Bonn in 1824. He studied botany in Athens, Copenhagen, Göttingen and Bonn. In 1856 Brandis was appointed by the English to be in charge of the teak forests in Pegu, Burma, which had been annexed in 1852. The teak forests were being depleted by timber traders. Brandis attempted to encourage the regeneration of teak by preventing fires, regulating the shifting cultivation of the Karen people, and by using Karen labour to further the German approach to forestry (Rangarajan, 1994). In 1857 his commission was extended to cover all Burmese forests (Lee, 1912). In 1864 Brandis was designated by the Government of India as the first Inspector-General of Forests (Lee, 1912; Tucker, 1983 says the year was 1865), a position he held until 1883 (Lee, 1912; Clepper, 1971). While forestry practices were evident on the Indian sub-continent prior to Brandis (see Rangarajan, 1994), his work extended the notions of German scientific forestry which later influenced forestry in British Columbia and Australia. In 1899, in an article based on information supplied by John Ednie Brown, a regional Western Australian newspaper commented that 'India is in possession of the finest Forest Department in the world' (anon, 1899, 10).

By tracing the networks that involved Sir Dietrich Brandis, and other actors and intermediaries (such as texts), it is possible to trace the origins and movements of ideas that have had a profound impact upon forestry in Australia and Canada. This is the perspective from within the network. However, one of the previously discussed limitations of Actant-Network Theory is that it fails to address concerns raised from outside the network. This aspect of forestry history includes the reconceptualisation of ideas at a later point in time. For example, Rangarajan's (1994) assertion that in India forestry was a way of claiming territory is likely to gain more recognition now than it would have among scientific foresters in India in the nineteenth century. According to Rangarajan, 'foresters were often the new face of an alien power, whose control over the countryside extended far beyond the cultivated lands into the hills and jungles' (Rangarajan, 1994: 147).

Forestry was also a way of claiming the 'resources' of a territory. The political economy of Brandis' actions meant that the teak in Pegu had been rescued from timber traders and was available for English shipbuilding. This was important in a time of naval expansion, the decline of English and Welsh oak supplies and the past experience of Baltic supplies being cut off by Napoleon (Rangarajan, 1994; Sivaramakrishnan, 1995). Similar to Burma, the English colonialists benefited from Brandis' work in India, particularly where the flow of agricultural produce and mining output was transported by rail to the ports. By 1921 India's railway system covered over thirty seven thousand miles and was 'the greatest in any colonial country' (Sivaramakrishnan, 1995: 9). The manage-

ment of forests was vital for this process of exploitation, because the steam engines were powered by wood, and the trains ran on tracks laid on a bed of wooden sleepers.

Besides his wife's connections, Brandis was practising German systematic forestry in India for the English because, even as late as 1885, England was almost the only European country without a forestry school (Brandis, 1885 in Saldanha, 1996). Faced with a limited supply of wood for naval purposes, they had to turn to German expertise. This expertise had developed over time, beginning with an early emphasis on the most useful 'resource', i.e. oak. By the end of the eighteenth century, the German empire had 'nine forest schools, ten periodicals and one general association of German foresters' (quoted in Saldanha, 1996: 197). In 1885, Brandis' successor in India, Sir William Schlich, established a forestry department of the Royal Indian Engineering College at Coopers Hill, England. This department was transferred to Oxford University in 1906 (James, 1981). Between 1889 and 1896, the five volumes of *Schlich's Manual of Forestry* were published, with Schlich writing the first three volumes and the final two being translations of German forestry books (James, 1981). James (1981) cites at least five major books on forestry that were translated from German to English between about 1890 and 1904.

NETWORKS CONNECTING EUROPE, INDIA AND NORTH AMERICA

In his later years, Brandis worked at Kew Gardens in London and, from 1888 to 1896, supervised the continental training of English and American foresters (Lee, 1912). According to Clepper (1971), it was Brandis who suggested the young Gifford Pinchot enrol in the L'Ecole Nationale Forestiere in Nancy. Pinchot then 'toured European forests under Brandis' wing' (Steen, 1976: 48). Miller (1994) also recognises Brandis as being Pinchot's mentor. In the 1890s Pinchot's protégé, Henry S. Graves, who later became 'the first occupant of the Pinchot Chair of Forestry at Yale, an act of direct patronage by the Pinchot family' (Williams, 1989: 442), also 'received guidance in his studies from the famous forester, Sir Dietrich Brandis' (Rogers, 1991[1951]: 219).

In 1898 Gifford Pinchot was appointed to succeed the German forester Bernhard Fernow as Chief of the U.S. Division of Forestry, which later became the Bureau of Forestry and then the Forest Service. Pinchot, aided by the passing of an amendment in 1897 which created Forest Reserves to be managed, rapidly expanded the organisation from a staff of thirteen, six of whom were clerical staff, in 1898, to 821 in 1905 (Clepper, 1971: 29). However, 'in 1897, there were a few technical foresters in the United States – Fernow, Pinchot, Schenck and Graves – who had received technical training' (Clepper, 1971: 28). Even then, Clepper (1971: 31) suggests that 'Pinchot's European forestry instruction, in classroom and field, appears to have totalled not more than thirteen months'.

HISTORIES OF FORESTRY

These ‘technical foresters’ all knew each other (and slightly younger foresters such as Schenck’s apprentice Overton Price, who later became Pinchot’s deputy at the Forest Service) as associates, mentors or protégés (see Clepper, 1971). A significant link in these networks was the German botanist and forester, Sir Dietrich Brandis.

Connections through professional associations, governmental positions, demonstration projects and the academy, enabled ideas to travel between a small number of people concerned with the professional management of forests in North America. Specifically, these connections included;

- professionalism: Pinchot was the first President and Graves edited the journal of the Society of American Foresters, formed in Washington D.C. in 1900; Fernow was one of eight members elected at the third meeting (Rogers, 1991[1951]: 296);
- governmental positions: both in the USA and Canada;
- demonstration projects: e.g. Biltmore (owned by George Vanderbilt) was managed by Pinchot from 1892 to 1895 and then, after Pinchot consulted Sir Dietrich Brandis, by Carl Schenck, who had assisted Brandis on one of Brandis’ western European forestry tours; see Clepper, [1971]); and
- the academy: particularly Yale University, which was the focus of Pinchot’s academic interest, and the University of Toronto, where Fernow taught.

The ideas travelled by direct conversation, letters, literature and conferences such as the American Forestry Congress of 1882 at Montreal, where Bernhard Fernow ‘... brought to the American continent a prospectus for scientific forestry. His address there ... was the beginning of organised forestry in America’ (Rogers, 1991 [1951]: 604).

This small cluster of men, institutions and ideas evolving in various parts of the world throughout the nineteenth century was to have profound effects on forestry during the twentieth century. Their influence has travelled across space and time. This is stated from an admiring resourcist perspective, by H.R. Curren, writing to Bernhard Fernow in 1913;

‘Forestry takes men far. What a debt the future owes to Germany for her care of the world’s forests. Brandis in the East and your work in the West, that now takes a new scope’. Rogers, 1991 [1951]: 591-92

At a conference in 1912 in Victoria, British Columbia, Fernow described the meaning of forestry, and argued the need for it in the USA, as propounded by von Steuben in his nineteenth century visit. He said;

Exploiting means to take all the cream, all the useful material you can find, and leave the rest to perdition. That is exactly what has been done on this continent ever since the first settlers came. For forest destruction is the beginning of civilisation.

In a forest country it is necessary first in order to have farm lands to remove or destroy the timber. Therefore, there is no fault to be found with those who have been exploiting the forests, who have burned them in order to get rid of them, and to get the land for food production. ...it is possible to take any forest and treat it in such a way that it will produce a wood crop. In other words, forestry is nothing different from agriculture except in the crop which it grows. Forestry uses the soil for the purpose of getting a wood crop... forestry is ... the application of scientific methods in the production and reproduction of wood crops. (Fernow, 1912, quoting von Steuben, in Rogers, 1991: 53)

However, conditions in India, and in Coastal and Interior British Columbia, are not the same as the flatter plains of northern Europe. While ideas travel, one of those ideas is, as Carter (1996) demonstrates, to turn the earth 'into a passive planisphere' akin to a billiard table (Carter, 1996: 9). The history of homogenisation of the earth, whether in the classical economic concept of 'land', the 'normal forest' or the overlaying of geometric boundaries on the earth's physical surface, is culturally constructed and often contested.

FORESTRY HISTORY IN BRITISH COLUMBIA (BC)

Paul Carter (1996) argues that people flatten the earth in their imagination and on their maps, before literally doing so for urban subdivision or industrial forestry. Hammond (1991: 23) recognised that 'terrain, or the shape of the land, literally shapes the forest. As terrain becomes steep and broken, thin soils cling to the slopes, while landslides and erosion of all types become more frequent'. He also stated that,

terrain with slope gradients greater than 17 degrees is classified as steep ... Unlike the rest of Canada, the majority of forest land in British Columbia, probably three quarters of the total, is steep. Many forests in British Columbia are on broken terrain. (Hammond, 1991: 24)

Very steep areas of BC have thin soils. Most of the nutrients are stored in the trees. The land is very susceptible to landslides and various forms of erosion.

In British Columbia indigenous people 'used' the forests prior to the arrival of European explorers and settlers (see Williams, 1989; Cronon, 1983, for examples of indigenous use of the forest in North America). In 1780 Captain Cook used the forests of British Columbia to repair the masts on his sailing ships. In 1788 retired Royal Navy Lieutenant John Meares exported spars from Nootka Sound to the Orient in the first known example of taking from the forest for commercial gain.

White explorers often sailed to the 'New World' and saw a virgin country, a pristine wilderness untouched by the human habitation they had left behind in western Europe. This mistake effectively erases native people from the history

of a particular place. As William Cronon (1983: 12) noted; 'In Francis Jennings' telling phrase, the land was less virgin than it was widowed'.

Indigenous people affected what is sometimes called 'virgin forest' by, amongst other things, burning small areas or burning the undergrowth to aid hunting. This creates an 'edge effect', i.e. microclimates are modified in both the forest canopy and the opening created by burning due to the microclimatic impacts of each on the other. Hammond (1991: 9) noted that indigenous people 'have no word for wilderness. They were and are part of the forest'.

The non-indigenous history of British Columbia is also very important for forestry. Rather than accepting British Columbia as given, the creation of 'British Columbia' through the Oregon Treaty of 1846 has important implications for forestry in the province. This treaty effectively extended the boundary between Britain and the United States resulting from the Treaty of Ghent at the end of the War of 1812. The Treaty of Ghent established the 49th Parallel as the dividing line between what, in 1867, became Canada, and the United States of America.

The 49th Parallel as a border was easily established prior to detailed surveying and, on the plains/prairies, did not over-ride obvious physical boundaries. However, from the Rocky Mountains to the Pacific coast, the Columbia River was a potential border. This border was favoured by the British in the 1840s. The Americans wanted to extend the 49th Parallel to the Pacific Coast, effectively giving them control of the Oregon Triangle (part of modern day Washington State). The Americans gained the ascendancy through immigration into the northern Oregon Territory in the mid 1840s, and because of the British lack of knowledge about the resource potential of this region (Moreau, 1996; Favrholt, 1996). The treaty of 1846 gave the U.S. the most fertile agricultural lands then being operated by the Puget Sound Agricultural Company. The residual British territory of British Columbia (now containing only the headwaters of the Columbia River) was largely densely forested and mountainous. An important implication of the Oregon Treaty is that it limited the agricultural potential of British Columbia, but it left two potential resources in the hands of the British, i.e. trees and coal.

The first of these 'resources', trees, was exploited early. Mackay (1982) noted that the first sawmill built in British Columbia was constructed by the Hudson's Bay Company in 1848, two years after the Oregon Treaty. In comparison to the more established mills on Puget Sound, the fledgling mills in British Columbia in the nineteenth century were small and produced a much lower volume of lumber. This was partly due to the lack of a sizeable market. Although Mackay (1982) claimed there were thirty sizeable mills on the coast by the turn of the century, producing five times as much lumber as in the early 1890s, it was not until the twentieth century when the Panama Canal reduced the voyage from Vancouver to England by ten thousand miles that it became viable to export British Columbian lumber to England (after Mackay, 1982).

It is important to recognise the role of indigenous people in the labour supply for these early mills. Lutz (1996) discussed the Haida people travelling south from Haida Gwaii to the Puget Sound sawmills to work in the 1850s. Similarly, Wyndlow (1962) wrote of the reasons for locating the first sawmill at Chemainus on Vancouver Island in 1862 as being;

Here were available water power, an excellent harbor, unlimited timber and Indian labor. Could conditions be better for a sawmill? (Wyndlow, 1962: page unknown)

However, it was in the early years of the twentieth century that specific events led to the development of scientific forestry, based upon German models of forestry, in BC. In 1903, Richard 'Dicky' McBride became Premier of the province. He inherited an empty treasury because the 1897 Yukon Gold Rush (and its financial returns to British Columbia) had faded and, occurring simultaneously, Californian oil had reduced the demand for coal from Vancouver Island (Mahood and Drushka, 1990). The oil industry began in California in the 1850s, but it was not until the 1890s that Californian oil production rapidly increased. It grew from thirty seven barrels per day in 1879 to 7 239 barrels per day in 1899 (White, 1962). Even then, it was not until 1904/1905, with fierce competition between the Standard, Associated and Union companies, that the Standard and Union companies extended their activity along the northern Pacific Coast while Associated 'viewed that territory dimly because coal was cheap there' (White, 1962: 314).

In late 1905, the Union Oil Co. 'invaded British Columbia, the home ground of the coal industry' (White, 1962: 314). With the Yukon gold rush still strong in memory, Premier McBride set out '... to replace the gold rush with a timber rush: observing that forest activity in Oregon and Washington brought a huge influx of capital to the developing deep sea port of Seattle, he threw open British Columbia's public timber lands' (Mahood and Drushka, 1990: 16). According to Gray (1989: 24), 'between 1905 and 1907, transferable twenty-one-year licences were issued on over fifteen thousand square miles of Crown land'.

This led to short-term financial gain as the transferable licences were speculated. It also meant almost all accessible forests were in the hands of speculators. These forests were often close to the shore, for water transport considerations, and in strategic locations at entrances to valleys. The speculators were often loggers from the mid-west USA; Michigan, Wisconsin and Minnesota (Mahood and Drushka, 1990), who by this stage had cleared most of the forests in this region and were looking for new frontiers (Cronon, 1991). To this day, the private lands of major forestry companies can be traced via purchases and mergers to this original 1905-07 give-away.

One long-term implication of this quick 'grab for cash' was the perception of private ownership as being 'fly-by-night' speculative capital, mostly American, destroying 'our forests'. The security of public ownership, and larger, established corporations who were likely to stay in BC, was considered more

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desirable. Another implication was the desire to create a management structure to avoid in future the perceived excesses of McBride's give-away. The model, the myths, the language, and the protégés to staff this management structure, which has evolved into the contemporary British Columbia Ministry of Forests, came from the U.S. Forest Service. These, in turn, largely emerged from German forestry.

For British Columbia, the influence of Fernow, as the leading adviser to the government on forestry in 1909, continued with the development of an organisational structure created by Pinchot's protégé, Overton Price. To staff this new structure, Henry S. Graves recommended a recent graduate of the forestry school at Yale University, H.R. MacMillan, be appointed as Chief Forester. MacMillan occasionally consulted Fernow after his appointment (Rogers, 1991[1951]).

In his position as the first Chief Forester of British Columbia, H.R. MacMillan appears to have been more interested in promoting timber sales than conservation. He left this position and formed his own export company in 1919. When MacMillan did later manage forests, he, like Bloedel, Stewart and Welch Limited in the U.S. north-west, was more oriented to the 'harvesting' approach of forestry taught by the German foresters and their protégés than the cut-and-run operation often associated with small logging outfits. However, as Heske (1938) noted, the context of the original German ideas of Sustained Yield Management no longer existed, and in a period of capitalist competition, practising silviculture did not make economic sense because it diverted resources from expansionary activities.

FORESTRY HISTORY IN NEW SOUTH WALES (NSW)

Unlike in India, foresters in Australia were not the 'new face of an alien power' (Rangarajan, 1994: 147). In Australia, foresters came long after the indigenous people had been killed, removed from the land or subjugated in various ways. In a chapter titled, 'They Hated Trees', Bolton (1992: 37) notes how

the first European arrivals in New South Wales may well have been oppressed by what they saw as the vastness of its forests. Many of the earliest drawings of the Australian bush tend to exaggerate the size of the trees and to dwarf the human figures among them.

In the above quote from Bolton, for 'European' read 'English'. Cultural factors influencing the way people relate to forests are recognised by Rangarajan (1994: 153) who discerned differences between German and British values in the very deep British 'ideological animosity towards uncultivated lands'. This was attributed in part to the Agrarian Revolution and to the history of the British in seventeenth century Ireland, where forests were levelled to remove cover for Irish resistance to colonisation.

Later it is possible to see the confluence of these events (i.e. the Agrarian Revolution and fighting the Irish) in the frontier mentality of forest exploitation in Australia, Canada and the USA. In North America this movement occurs from the Great Lakes (see Cronon, 1991), through to the north-west of the USA and then to British Columbia. This movement fitted with von Steuben and Fernow's concept of removing forests for farmland, thus encouraging exploitation and no significant application of Sustained Yield concepts. This approach did not work in British Columbia because, unlike in some areas south of the 49th parallel, most of the province is mountainous. It is inhospitable for farming and is prone to soil loss following the removal of trees. Many of the nutrients are stored in the trees, rather than being leached from the soil by the heavy rainfall. This leaves relatively infertile soils once the trees have been removed.

However, in Australia once the land was cleared, agriculture could proceed. Many histories of Australian forestry (Bolton, 1992; Carron, 1985; Hudson and Henningham, 1986) recognise the 1803 proclamation of Governor King in NSW forbidding the cutting of trees along rivers and watercourses because of the resulting increase in erosion. Similar to BC a century later, the earliest exploitation of the forests was along the coastal valleys. This was partly to do with transport considerations for commercial timber, which was first exported in 1791 (Hudson and Henningham, 1986), but unlike much of BC it also was clearing land for agriculture.

With the discovery of gold in the 1850s, there was an increased demand for timber for mine shafts, and housing for the population attracted by the lure of gold. In NSW licences were issued for logging on Crown Lands, but as Hudson and Henningham (1986: 13) noted, 'the only real purpose of the measure was to raise revenue, for the licensee was able to do as much as he (sic) pleased in the forest'. The demand for wood also rose with the development of coal mining. Timber was used to construct shafts and to power engines at mines. It was also used for railway sleepers. By the late 1880s, for various reasons, trees were often seen as a resource for the mining industry.

This perception was important in the early development of forestry in New South Wales. Faced with an increase in the use of trees, and perceptions of waste, the first timber reserves were created in 1871. In 1881, the Governor, Sir Henry Parkes created the State Government Forest Service and appointed the poet Henry Kendall as Inspector General of Forests. This action is variously interpreted as 'a piece of literary patronage' (Bolton, 1992: 48) or the appointment of a person with extensive knowledge and understanding of the bush, and with wide experience of working in the timber industry who, apart from poor health, 'should have been an ideal person for the job' (Hudson and Henningham: 1986, 33). Interestingly, while it is earlier than British Columbia's appointment of H.R. McMillan in 1912, the appointment of Kendall did not signal a move towards industrial or scientific forestry along the lines of the German model.

Kendall died of tuberculosis in 1882. In March of the same year, a small branch originally under the Lands Department, but transferred to the Mines Department in 1878, was converted into a Forest Conservancy Branch. This organisation became a political football – being transferred frequently between the Lands Department and the Department of Mines, until it became the Department of Agriculture and Forests in 1894. It was re-established as a Branch of the Lands Department in 1897 (annual reports; Carron, 1985).

Rather than concentrating upon the organisation of forestry in NSW, this article will now highlight the European connections of three influential foresters who worked in the state. The choice of these vignettes highlights the value judgements of the author. Further, the importance of connections emphasises the other necessary actants involved in shaping NSW forestry, rather than concentrating on the work of ‘great men’ in isolation. We begin these brief biographies with John Ednie Brown.

It was not until the appointment of Brown as the first Director General of Forests, in 1890, that forestry rose in profile in NSW. There is a marked difference between the earlier Annual Reports in the 1880s with Brown’s visionary report for the year 1890. This later report set out a vision of forestry, a proposed Forest Bill, a reorganisation of the department, and ideas for forestry education. However, in the Depression of the 1890s, the report was largely forgotten in wider political circles.

Brown was born in Scotland in 1848. He learned about forestry working with his father for three years before ‘he was sent to the large Invercauld estate in Aberdeenshire’ (Nairn, et al., 1969: 261). Brown then worked at the Wass Estate in Yorkshire and Lady Manxe’s woods in Sussex (Loyau, 1885). In 1871-72 Brown visited Canada and the United States to study trees and forests. He was awarded the gold medal of the Highland and Agricultural Society for his essay titled ‘Forests of the Eastern States of America’. He also wrote an essay ‘Report upon Trees found in California’. Another essay, ‘The Trees of America’, won the Scottish Arboricultural Society award (Nairn, et al., 1969: 261).

In 1878 Brown was offered the position of conservator of forests in South Australia (Nairn, et al., 1969). South Australia had been the most progressive of Australian colonies (they did not become states in a federation until 1901) with regard to forestry. Bolton (1992: 47) attributed this to South Australia having ‘timber resources [which] were markedly smaller than those of the other colonies’. He also notes, unusually in Australian forestry history, that the influence of a German settler, Heinrich Krichauff, was influential in developing scientific forestry in South Australia.

When Brown was recruited by the NSW government in 1890, it was seen at the time as ‘securing the services of so valuable an official’ (Australie, 1890: 20). At the time of Brown’s appointment, ‘Australie’ also commented upon the publication of ‘a useful Manual of Forestry’ by ‘Dr. Schlich, late Inspector-

General of Forests to the Government of India' (Australie, 1890: 20). In the same article, 'Australie' praises German forestry where 'every tract is carefully surveyed and treated on a working plan made with great exactness as to the actual details and expected growth' (Australie, 1890: 20). The German idea of forests as crops was evident in Brown's first annual report. He even associates indigenous forests with crops when discussing the role of white settlers in Australia. 'They cleared away indiscriminately the crops which nature had placed upon the land from the earliest stage of the world's history; and made no provision for reproducing them' (Brown, 1891: 1).

The influence of German ideas (via India and Oxford) on Australian forestry continued into the twentieth century. When the Australian Forestry School was established in Adelaide, South Australia, in 1911, Norman Jolly was its first lecturer (Grant, 1989). When this school was moved to Canberra in 1927, Charles Lane-Poole became the Acting Principal. While some forestry administrators rose through the bureaucratic ranks in a particular Australian colony/state (e.g. R.D. Hay in New South Wales), Jolly and Lane-Poole are part of networks that involve German, French and colonial postings.

Jolly was a South Australian sporting star and intellectual achiever, who, in 1904, became the first Rhodes Scholar from that state. At Oxford he graduated with first class honours in Physics in 1906, and in 1907 attained the Diploma in Forestry, studying under Sir William Schlich (Nairn and Serle, 1983; Grant, 1989). His forestry studies included (obviously for a very limited time) experience in France, Switzerland and Germany. He worked for the Indian Forestry Service in the teak forests of Upper Burma until 1910, before returning to key forestry positions in South Australia, followed by Queensland and New South Wales, in 1918 (Grant, 1989).

Lane-Poole was born in Eastbourne, England, educated in Dublin and then at the Ecole Forestiere, Nancy, France. In 1906-07 he was at the South African Forest School, and later served as district officer in the Transvaal before returning to Australia (Nairn and Serle, 1983).

Given these connections, one may expect to find large areas of 'scientifically managed' softwood plantations throughout Australia. While this is the case, there was also a reluctance from some foresters to support the wholesale clearing of unique forest areas for agriculture and for pine plantations. As Powell (1988) noted, some Australian states, particularly Queensland and Western Australia, were more interested in land clearance than either 'locking up' land for timber reserves, or the Conservation (as distinct from Preservation) of forests advocated by Gifford Pinchot in the USA

As argued in Actant-Network Theory, the ideas were 'translated' rather than 'transmitted'. While some foresters wanted to apply the science of German forestry in Australia, others preferred a conservation approach to the indigenous forests. The ideas did not exist in a vacuum, and as Actant-Network Theorists argue, the success of particular ideas comes from the association of actants, not

from the quality of the idea itself. Thus, as late as 1931, a Queensland Royal Commission was able to conclude that 'Queensland needs no forestry science for present requirements ... the productive wealth of the country suffers at present from the fact that there are too many, rather than too few trees' (Lines, 1991: 183).

It is acknowledged that the networks linking German forestry ideas with practice in NSW, and Australia generally, were tenuous in relation to the networks in BC, and North America generally. However, as Law (1986) demonstrated in relation to Portuguese naval exploration, tenuous links can be maintained and can be very significant in their impact. In both Australia and Canada, forestry has been strongly influenced by the ideas that originated in specific social, economic, political, cultural and ecological conditions in locations such as Germany. These conditions are not replicated in Australia, Canada, the USA, England, India and Burma. The history of forestry is significant in that it is both about the translation of these ideas to suit new conditions, and the inappropriate application of these ideas because of the failure to translate the ideas to different conditions.

CONCLUSION

The histories of forestry in Australia and Canada are similar in that they have both been influenced by ideas emanating from locations such as Germany. This article has briefly explored what I believe are key translations of these ideas by focusing on New South Wales and British Columbia. It was possible to choose other states/provinces and to explore aspects of forestry history in more detail for each jurisdiction.

However, this article demonstrates that the ideas originating in Germany were further developed on the Indian subcontinent, and in institutions such as Oxford University, before reaching British Columbia and New South Wales. Using a Modified Actant-Network Theory, it is possible to follow the networks through government appointments, conferences, universities, professional associations, personal correspondence, demonstration projects and publications. It is through these networks, established by the actants themselves, that ideas were translated rather than transmitted. The concept of translation (adapting ideas) recognises the importance of individual preferences, available resources, political circumstances and local conditions. What has not been explored in this article, and may be an area for future research, is the extent to which the networks involved a counter-flow of ideas that may have influenced the development of German forestry.

Using this theoretical approach, it is possible to tell stories of forestry that until now have generally constituted a 'silence' in forestry history. This does not signal the end of the locally based, corporate based or the retired forester's

reminiscent versions of forestry history. In many ways these stories highlight how, and to what extent, the process of translation of ideas has occurred. Rather, it means that these histories are situated within stories of forestry that are temporally longer and spatially larger. This history has been explored through networks, but it has also questioned the construction of Nature, British Columbia and, to a lesser extent, ideas of what constitutes 'forestry'. These terms are not given, rather they are constructed and maintained through social relations. Ideas are made durable through media such as books, university curriculums, departmental policies and accepted versions of history.

This approach is a shift in focus from versions of forest history that have been prevalent, especially, but not exclusively, in Australia to date. This enables alternative stories to be told, and gives voice to many of the silences identified earlier in this article. The 'voice' is the voice of actants as they construct their own networks, but this voice is necessarily mediated by the durability of their 'texts', the mediations of other authors as actants, and by my own ordering of the materials available. In Modified Actant-Network Theory, as in the work of many historians, the author is an explicit actant.

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Secure from Rash Assault

Sustaining the Victorian Environment

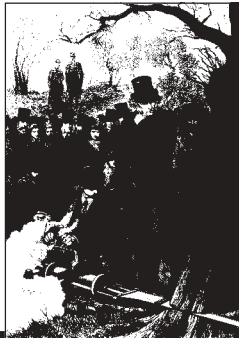
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