

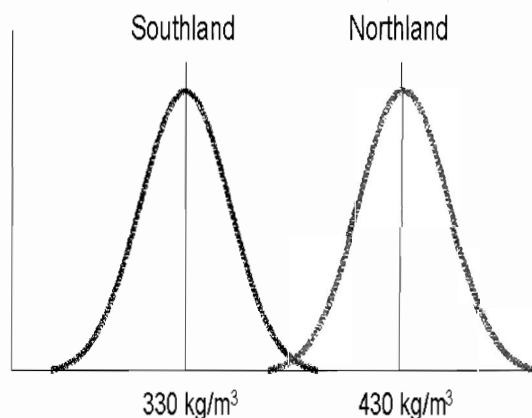
Good wood and blind prejudice

Sir,

Profitable wood processing - what does it require? Good wood! (NZ Journal of Forestry, May 2004) has an extraordinary diagram (below) showing "the most extensively researched property (wood density)..." for Southland and Northland forests. There are a number of possible interpretations of this diagram:

- (1) It is a schematic – a cartoon – designed to ingratiate northern interests.
- (2) It is a demonstration of the irrelevance of density as an indicator of wood quality.
- (3) It is a Maginot Line inhibiting lateral thinking.
- (4) It is a revelation of major significance.

Fig. 1: Average stem wood density as contrasting sites.



As drawn, the figure indicates that at the lower 1% exclusion limit the basic density of Southland trees is only 280 kg m⁻³, which adds a new term to the radiata pine lexicon: balsa. Do these trees really exist in such abundance? Go; tell that in Gore and Tapanui!

Indeed if this diagram is representational, rather than schematic, then it questions the case for density as the dominant general wood quality indicator for solid wood products. Southland pine sells well and commands a premium for its pale, uniform visual qualities. On the other hand even Northland struggles to provide adequate structural timber for LVL so on that score, logically, New Zealand should be growing higher density eucalypts – a great idea.

People have known about these density trends for 30 years. Density is "the most extensively researched property..." and FRI said this previously in 1992... - and what good has that done New Zealand forestry? *What's New in Forest Research* #31 asserted that "recent work has shown that a modest increase in density (for example 10%) will improve strength of framing

timber to such an extent that even though the knots are 50-70% larger the timber remains as strong". The claim was repeated in the *NZ Journal of Forestry Science* in the same year (1975). The insight was so breath-taking that it had to have impeccable credentials. Yet its basis was nothing more than the observation that density and significant wood characteristics co-vary with age: outerwood is denser than corewood and also coincidentally happens to be stiffer (because of its lower MFA). It was an imperfect diagnosis masquerading as insight. This misplaced confidence in density – or misconceptual paralysis – inhibited research into more relevant characteristics. Yet 40 years ago dissenting minds at IRL (the old DSIR) had offered a different, more sophisticated interpretation built around the microfibril angle – but it was too much trouble to understand. Further why bother, when the easy answer was out there? It's density, stupid!

Southland foresters know that they are fortunate because their wood is more stable as low-density wood shrinks less and moves less in service. Density merely magnifies the effects of intrinsic wood characteristics, whether good or bad.

A tragedy for New Zealand science is that it has elected to *fly in formation* (an unfortunate phrase from the early 1990s), a policy that is more concerned with giving control to self-serving High Priests (government and top managers) than in liberating individual scientists (... too **** ill-disciplined). Flying in formation is a brilliant concept IF AND ONLY IF you have the right Priests, the right overall strategy, a correct sense of direction and the right tools. If the outcome has been correctly defined then such convergent thinking may be desirable. However, with consensual collectivised management individual commitment is far lower as decisions are buttressed by groupthink and outcomes weakened by shared irresponsibility: intellectual drift.

The necessary public knowledge can be incredibly vacuous being founded, not on personal experience – though it may draw ultimately on the experience of a few – but on an abstraction of some idea. It might be a big lie (uncritical acceptance of an orthodoxy?) - Britain "won" the Falklands war - or an opinion posing as fact - like a cross-dresser with all the attributes of a pretty woman except the essential ones. *Profitable wood processing* offers examples of woolly thinking milked by vested interests, alluding to untreated lumber in leaky homes and poorly monitored machine stress grading. Did no one know, let alone foresee such things? Do manners mean eschewing criticism of others? Was the problem flash housing – appearance

ahead of substance – getting exactly what was paid for rather than what was wanted? To anticipate the inconceivable, the need is to think divergently, to embrace dissent and be brutally realistic – a hard task to delegate to a committee!

Profitable wood processing struck a raw nerve because the University of Canterbury sought assiduously to measure regional variations in fundamental wood properties... and in Otago-Southland. Our FRST programme got subsumed within WQI. This trawling study would have involved measuring standing tree stiffness, MFA and other characteristics and generated within and between tree maps of wood quality region by region (collecting, cataloguing, correlating), but the proposal was declined. Maybe it was pragmatic and unimaginative. Certainly natural, unconstrained systems like forestry are too frequently the playground for empiricism – management prescriptions are simply shape-shifting rafts of logic floating on a sea of partial variables. The moral? Empiricism is fine if one checks one's bearings frequently, but better still to be loosely moored to the basic sciences as well as being critical of and more attentive to macro-externalities.

Fresh perspectives

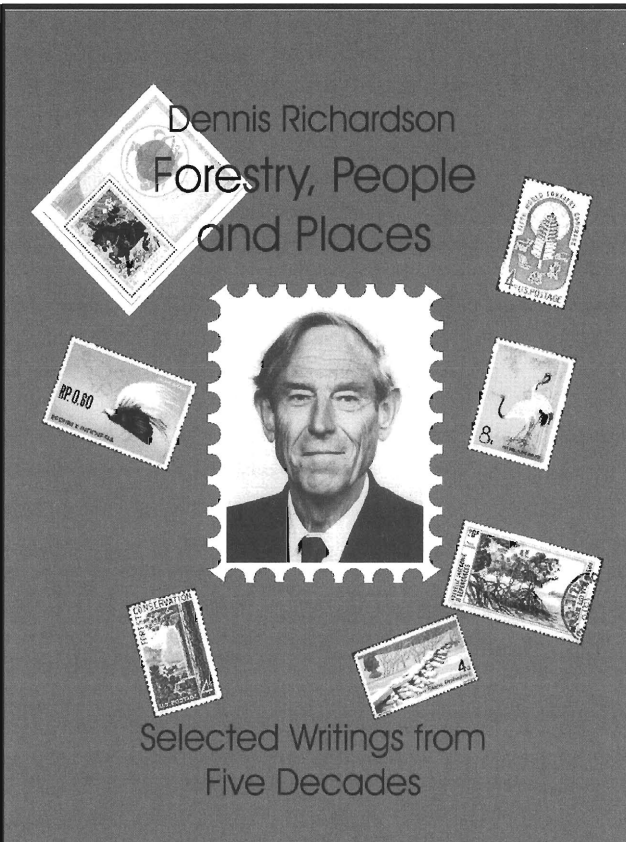
For example, one hot game is the hemicellulosic league – a very ancient game played out by trees on nanoscale pitches between indefinite surfaces of cellulose and lignin. Savvy Priests are signing up **** ill-disciplined scientists to tell them the names of the star players (arabino, galacto, gluco, manno, xylo with their half- and full-sib cross-bred brothers); to understand their role-positions as Wall Huggers, Twisters and as Velcro-Creeps (both Zippers and Strippers) and their changing relative abundances; and to learn the rules of their engagement. Further virtually all the adsorbed cell wall water is confined to the same playing field – to bind and interact with these hemicelluloses. But why the strangely-rich diversity? What do they all do? In a constrained system why do trees invest 50% of cell wall volume and 30% of their biomass in these hybrid creeps? Think about it! Wood remains one of the oldest and least understood of nanoscale materials. An imperfect analogy may be that hemicelluloses perform the functions of rigging (ropes, splices, blocks) of a sailing ship – transferring loads amongst the microfibrils (masts) and with lignin (hull); the sails (needles and branches) are part of another metaphor. Hemicelluloses are found in all higher plants and algae giving foresters, as small-time players, the chance to join with more powerful commercial interests in signing up the best teams or key league players. This is just one vein in the

divergent subversive underworld of wood quality R&D that together promise to reveal the strategies of living trees... and so explain the riddles of shrinkage and stability in a stick of Southland pine. It is a superior game to the empirical and easily comprehended “hunt the correlation” to which forestry is so heavily addicted.

Mao Tse Tung said that a picture was worth a thousand words. This density diagram is a symbol, a symptom, and a ghost from our past. Had it been published 20-30 years ago maybe there would have been fewer wasted years. Why shame us now? This diagram defines our common limitations in the same way as that a single photo from Trang Bang spoke of the horrors of napalm, and as Abu Graib became the desert of hubris.

Discovery is seeing what everyone else has seen and thinking what nobody else has thought. For example, maybe option (4) above is correct and Figure 1 is a subliminal revelation of major significance – an insight from a Freudian that *love is a woman's breasts*. Apologies tendered.

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