

GENERAL COMMENTS

voltscommissar.net gratefully acknowledges the tradition and important ongoing role of executive/judicial investigations in wealthy liberal democracies, and recognizes what a privilege it is to be able to communicate freely in response to the call for public submissions to the **2009 Victorian Bushfires Royal Commission (VBRC)**. It is to be hoped that adequate resources are available to the Commission to fully exercise its investigative powers.

The Curse of Modern Technology: "TOO MUCH INFORMATION!" In 1939, Judge Leonard Stretton had access to an army of public service shorthand transcribers, stenographers and typists, and to a Government Printer with a hot metal typesetting workshop. With these 'meagre' resources in Depression-ravaged Victoria he managed to generate over 2600 foolscap pages of single-spaced transcript, and have a thirty-five page Report¹ presented to the Governor in Council by 17th May 1939. How odd, with all the alleged productivity benefits of information technology, that *submissions* are still being accepted for this current inquiry up until 18th May 2009. It is to be hoped that the veritable avalanche of well-meaning submissions (such as this one!!) do not result in the Commission's work being overwhelmed in a flood of data with a potentially low "signal-to-noise" ratio.

The Curse of Money: It is respectfully suggested that vested interests with significant financial resources are those most likely to shout loudest, to be least likely to use scientific or objective evidence in their arguments, and yet they will have the most impressive-looking and persuasive counsel, and are therefore the ones whose arguments should be deconstructed most forensically. Again, this is potentially a bad case of much noise and little meaningful signal.

Reinventing the Wheel: The 1939 Stretton Royal Commission Report, the 2003 COAG Bushfires Enquiry Report, and several other major investigations in Australia alone, have covered much of what will probably be sound and very important "reductionist" recommendations arising from this Royal Commission. What will distinguish the final Report of the VBRC is a bold "synthesis" or systems analysis that identifies, and speaks to, the increasing death toll from Victorian mega-fires as being part of the overall response of the Earth-system to Mankind's corrosive attacks on that system.

Reductio-nism Ad Absurdum: A lady interviewed in Healesville on ABC Radio Melbourne 774 in the days following Black Saturday, describing herself as a geomancer, got it pretty right when she bluntly opined that Mother Earth is angry at humans for the abuse we have meted out to to Earth's biosphere for millennia, accelerating since the Industrial Revolution, but especially the ravages of a population explosion, and hyper-consumerist free market ideology over the past sixty years. Herman Daly, heterodox US economics professor, some years ago memorably said that **the economy is a wholly owned subsidiary of the biosphere**, to sound a loud warning bell to the global business community that their perpetual growth ideology is a dangerous, possibly genocidal delusion. As Peak Oil now begins to bite, arguably being a major player in triggering the global financial crisis, it behoves us to analyse Victoria's most recent mega-fire in the context of these current realities and future constraints: Comprehensive recommendations will take into full account: the scientific evidence of climate change on Victoria's so-called "drought" that's been dragging on since about 1996; the higher temperatures, lower humidity and stronger winds; the future scarcity or unavailability of cheap liquid fossil fuels for helicopters and/or firefighting trucks; the likely effect on the Victorian economy of an *annual five per cent decline in the availability of crude oil*

¹ Electronic facsimile, *comprising searchable ASCII text*, is now online at http://www.voltscommissar.net/docs/Leonard_Stretton-1939_Bush_Fires_Royal_Commission_Report.pdf

globally, now that Peak Oil has arrived. Although no politician dares admit it, the likely effect is that Western consumerist society, in the absence of slavery being re-introduced, is to follow the same inexorable decline. Our wealth is almost entirely predicated on cheap energy, particularly cheap transport energy. Knowing what we know about resource constraints, and the heating (radiative forcing) effect of carbon dioxide (CO₂) emissions, it would be remiss of the Commissioners to issue a Report with "*ceteris paribus*" qualifiers. Western society has taken Cartesian reductionism way past its use-by date. The time is long overdue for all public discourse to adopt a more sophisticated holistic systems analysis approach, though still rigorously scientific, so that all necessary measures can be taken to halt anthropogenic climate change before the two degree Celcius tipping point is passed.

On the weight of relevant expert scientific evidence that must surely be led in evidence by counsel assisting, your terms of reference² allow for climate change to be found to be a significant cause of the increasing death toll from Victorian mega-fires (historical series). It is respectfully suggested that the Commission will then need to consider whether to ignore the weight of scientific evidence, and let the fossil fuel industry off the hook, or find that the global fossil fuel industry, including all its component legal entities operating in the Victorian jurisdiction, played a demonstrable causal role in the death of Victorian citizens on Black Saturday. The evolving ferocity of Victoria's mega-fires to date is sadly only a tiny foretaste of the horrors that await seven billion souls on this overcrowded planet, once IPCC predictions of two, four or six degrees of global warming are realized.

"These fires were lit by the hand of man": Some before you have already claimed 'by failure of the electricity distribution network's SWER lines'; but more covertly and far more dangerously mediated by the combustion of fossil fuels at a rate with which this planet simply cannot cope. To extinguish and exterminate the global fossil fuel industry's operations in Victoria will be world's best practice in trying to prevent accelerating carnage from climate change in Victoria and more generally around the world, and should be the main recommendation in your Report to Government.

SPECIFIC ISSUES

1. THE "FLYING TOASTER" HYPOTHESIS. (*re:TOR#1. "Causes and circumstances..."*) This is a question the Commission should ask scientific experts: Do the smoke plumes of mega-fires exhibit the characteristics of low density fluidized bed furnaces? I'm postulating, having never experienced or witnessed one, that enough smouldering organic matter might become airborne in an oxygen-deprived cloud that as the leaves/bark/etc. fall down to the bottom of the plume, they re-ignite, and so become like a self-levitating fluidized bed furnace. If such a phenomenon has been observed by infra-red cameras, witness reports³ or accurate scientific remote sensing temperature measurements of the so-called "smoke" plume, it may help explain how it was, in the words of Stretton's 1939 Report, that "*Houses of brick were seen and heard to leap into a roar of flame before the fires had reached them.*"⁴ Can a person's hair be set alight at a range of 100, 200, 300 metres by a huge black/brown/glowing evil mass hanging and literally burning in the sky above them? A thin pall of smoke below such a putative burning plume may obscure all visible evidence of combustion, and yet the deadly infra-red radiation may be able to punch through

2 point "D" - "unprecedented weather" should reasonably be interpreted as acknowledging climate change to be real. Also TOR#6 regarding preparation and planning for the future, in which to ignore climate change would be to guarantee failure.

3 e.g. Marysville resident Elaine Postlewaite, interviewed at the 14'40" mark in ABC's 4 Corners program Eye of the Storm 27/4/2009 said "*Len, what about those red spots I can see in the smoke?*"

4 Stretton Report, page 5

thin smoke haze, and still set things alight. Surely depending on the slice (solid angle) of the sky that such a plume subtends, it might be able to ignite objects by radiant heat alone. When the Fire Danger Index (FDI) reaches a certain threshold, it should be possible to predict when ember attack may be accompanied by, or shortly preceded by, extreme levels of toasting/grilling heat radiating downwards from the plume, which make outdoors defence against ember attack an impossible fire plan to implement. This is probably a similar level of radiation at which timber roof battens ignite under a hot tin roof, and so is clearly a level of extreme fire behaviour for which the only tenable plan is to retreat underground..

This "flying toasters" question was put to Dr Justin Leonard of the CSIRO, after he was interviewed on ABC radio on 31st March, discussing fire behaviour in relation to new house design rules⁵ To date there has been no response to my email.

It needs to be said here, that the oft-stated scientific descriptor of fire intensity in terms of megawatts per *linear* metre (of rapidly advancing fire front) is a most confusing and unhelpful parameter for bureaucrats and the public to comprehend. The fire front does not advance in a nice straight line at a set number of kilometres per hour, with no heat effects until it is within range, and no effects once it has passed forwards out of range. The "flying toaster" idea, which in truth may just be another way of describing a specific type of mega-fire fireball, clearly shows that big, fast fires have a large "footprint" of both *area* and *volume*, and can radiate massive amounts of heat downwards from the base of the plume (t.b.c.) as well as horizontally from the fire front's visible flames. "Megawatts per metre" is a reductionist scientific model which transforms the turbulent maelstrom down to a kindergarten-level mental picture of a one-dimensional red line advancing across a map. The result of such a reductionist over-simplification is to seriously dumb-down the public perception of what is really taking place with complex fire behaviour. Residents electing to stay and defend against so-called "ember attack" need a much more sophisticated understanding of fire behaviour, and especially need to be armed with precise knowledge about hidden or unexpected sources of deadly heat radiation in order to understand the risks, and thus make the right decisions for survival.

2. DUGOUTS. (*re: TOR#2 "Preparation and planning..."*) Dugouts went out of fashion after World War II. Dugouts saved lives in 1939. One so-called dugout where mill workers perished on Black Friday 1939 was apparently an above-ground tin shed, so not a true dugout at all.

If one reads the 1939 Stretton Report, and replaces the term "mill-workers" with their modern equivalent "tree-change bush dwellers" we soon realize that the modern migration of people into wooded areas has resulted in many more people being exposed to fire risk than was the case with saw mills in the forests seventy years ago. We have been seduced by modern technocratic myths that we have dominated and tamed Nature. The 2003 ACT bush fires and now Black Saturday indicate that our perceptions, defences and strategies are seriously flawed. A car and a bitumen road seem like a foolproof escape strategy, but for some of those caught unawares by the raging firestorm, the escape route turned into a death trap.

In the 1930s and 40s it was known that underground shelters with 90 cubic feet (2.55 cubic metres) per person of air and 40 square feet (3.7 square metres) per person of wall/ceiling surface for cooling could sustain the lives of the occupants for the entire duration of a bushfire over-running and consuming their nearby above-ground dwellings and structures. Intense mega-fires or firestorms are *not* ember attack, and it seems likely that any dwelling designed to withstand such an inferno would be about as ugly and expensive as the belly of the Space Shuttle, or an inside-out

5 see Appendix 1

pizza oven (refractory bricks on the outside, and tiny windows made of quartz glass). Even if someone could afford to live, and enjoyed living, in such a bizarre structure, they would probably choose not to stay in it as the mega-fire threatened, as it would still be a deeply traumatic experience peering through the portals. Rich people tend to avoid unpleasant experiences like this: they can afford to take evasive action.

So it seems that affordable dugouts, or very expensive high-tech underground bunkers, are going to make a comeback, unless Stretton's recommendation to prevent people living in wooded areas is belatedly enforced. One modern design of a concrete-and-steel bunker shown on television since Black Saturday clearly did not have a traverse leading to the very wide entrance door. A traverse, and a *narrow* entrance doorway, are key design features in reducing radiant heat entry to the dugout (bunker, fire refuge) and should be mandatory. A detailed design drawing of a Forests Commission-approved Mill Dugout resides in the National Museum of Australia, in the Peter Evans Collection, object number SC0010.0001 A medium-resolution digital image copy of SC0010.0001 is, since 27th March 2009, available on the internet⁶.

Modern adaptation of dugout design and construction: treated pine may prove a suitable low-cost construction material for all but the entrance doorway/bulkhead. If any refuge is made too dry and cosy, people will use it for storage, thus defeating its purpose as a dark damp cave full of life-saving air.

3. "IMPLEMENT YOUR FIRE PLAN: Leave early, or stay and defend." (*re: TOR#2,6 "Preparation and planning..."*) **stay and defend** is a plan for putting your family members' lives at risk to defend material assets that in many cases belong to a bank as majority stakeholder, or are potentially a huge cost to an insurer if burned down. Neither the banker nor the insurer would have to put their lives on the line if they were to advocate for continuation of the extant policy. I have no evidence that they have had any input at all in making representations to governments, parliaments, or fire authorities about current policy settings. Insurance Council of Australia documentation⁷ states "The strategic intent of this blueprint objective, for the industry, is to firstly increase the effectiveness of our individual efforts for insured disaster victims and secondarily to improve and simplify liaison with an ever maturing State and Federal government emergency response system." The Commission may regard it relevant to discover whether such liaison might, in the minds of industry participants, legitimately include advocacy recommending a "stay and defend" option for their insured clients, irrespective of the Fire Danger Index.

4. McArthur Fire Danger Index (FDI) and the "stay and defend" option. (*re: TOR#2 "Preparation and planning..."*) The media announcements of government spokespersons, and fire authority spokespersons seemed to hold strongly to the script, despite the FDI indicating that it was not mere ember attack to be confronted, but hundred-megawatt per metre fire fronts. Surely if the fireys have a threshold of when to withdraw, the homeowner/mortgagee must also have built into their fire plan some strong reality checks about local topography/fuel load vs. house-type vs. forecast FDI: *e.g. "If you have no proper '30s-style dugout, you compulsorily evacuate; if you have a compliant dugout/bunker i.e. a guaranteed survival shelter, then you may stay and defend your property, but only if it is defensible under the predicted FDI."* This of course pre-supposes sufficient warning for a safe evacuation. Black Saturday clearly demonstrates that mega-fires can appear suddenly "from nowhere", leaving no time for safe evacuation, so maybe all homes in or

⁶ http://www.voltscommissar.net/docs/dugout_plans.jpg (see also Appendix 2)

1.1 MB

⁷ page 3, paragraph 5 of

<http://www.insurancecouncil.com.au/Portals/24/Issues/CAT%20Arrangements.pdf>

809 kB

near bushland need ready access to on-site fire refuges, based on the proven design principles of 1930s dugouts.

5. Vicious Circle: Coal Seam Fires and Anthropogenic Climate Change. (TOR#1 "circumstances") Most of Victoria's electricity comes from the combustion of brown coal, or lignite. Overlying sediments are removed, leaving the as yet un-mined fossil fuel exposed to dry out. Intentional exposure raises the undeniable risk that the coal seam will catch fire, indeed mine owners presumably take out insurance against the eventuality. Exposed coal seams at several open cut coal mines in Victoria have been ignited by approaching or over-running bushfires in recent years. One such mine adjacent to the Hazelwood Power Station is majority owned by International Power plc. International Power recently struck a deal with the Victorian Government in which it undertakes to cease operations once a further 450 million tonnes of CO₂ have been emitted from its power generation operations. If the Commissioners find, after weighing the scientific evidence presented to the Commission, that climate change is indeed responsible for the increasing Victorian death toll from mega-fires (historical series), then it is respectfully suggested that your report should recommend that coal seam fires at Victorian coal mines, whether ignited by approaching bushfire or by any other causal agent, must after it is extinguished by CFA and/or other firefighters, have an audit of the mine by independent geology experts to determine the amount of coal burned and the amount of fossil carbon released as CO₂. All such emissions thereby released to be documented in the national greenhouse gas emissions inventory, be fully paid for by the purchase of any carbon credits as required by emissions trading schemes, and in the case of International Power Hazelwood, be deducted in full from its remaining allowance of greenhouse gas emissions. The carbon accounting of coal seam fires must be clearly and unambiguously distinguished from emissions arising from combustion in normal bushfires, because fossil carbon is the only category with demonstrated potential to exacerbate the death toll from the scourge of future mega-fires. Up to this point the Victorian Government has not, as far as I am aware, been making any attempt at all to distinguish between CO₂ released from "normal" bushfires vs. CO₂ released from coal seam fires.

If the Commission really is serious about protecting the lives of Victorians, then it will be very hard to ignore the multiplier effect identified here, where a bushfire ignites a coal seam, and thus adds to global warming, making future bushfires more intense.⁸

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author/webmaster <http://www.voltscommissar.net/>

maintainer of <http://youtube.com/user/voltscommissar>

29th April 2009

⁸ see Appendix 3 - a picture of the Hazelwood coal seam fire September 2008

Appendix 1. Email to fire ecologist expert

Message-ID: <49D1A15C.2070209@suburbia.com.au>
Date: Tue, 31 Mar 2009 15:51:40 +1100
From: Michael Gunter <mickgg@suburbia.com.au>
User-Agent: Thunderbird 2.0.0.21 (X11/20090318)
MIME-Version: 1.0
To: Justin Leonard via <Matthew.Levinson@csiro.au>
Subject: flying fuel
Content-Type: text/plain; charset=UTF-8; format=flowed
Content-Transfer-Encoding: 7bit

Hi Justin,

I heard you on AM today. Are you related to Mike Leonard @ Bushfire CRC? Please point me in the direction of any research at present happening into a mega-fire's "smoke" plume being on rare and extreme occasions a form of low density fluidized bed furnace. This is mere speculation on my part, but was an idea in my head even before I heard you say this today:

"JUSTIN LEONARD: Not only just the flying, burning embers, but there's a lot of fine fuel that's in the air, and it accumulates and deposits all around structures." (ABC transcript, AM program)

To my mind, flying fuel mixed with oxygen is precisely what a fluidized bed furnace is. People described the cloud as terrifying and "evil", there were reports of people's hair being set on fire by radiant heat alone, and I'm mindful of words in the 1939 Stretton Report (p.5)

"Houses of brick were seen and heard to leap into a roar of flame before the fires had reached them. Some men of science hold the view that the fires generated and were preceded by inflammable gases which became alight."

Is anybody doing radiation studies under such "evil" clouds: heat flux studies using IR pyranometers (vectors resolved in horizontal and vertical directions) , energy intensity, remote sensing of smoke plume temperatures (from below, not from the side or from above), etc. to gather evidence if any such "flying fluidized bed" phenomenon is at work, adding to the destructive radiant blast from the fire front and visible flame front itself? If significant combustion is sustained within the plume, then previously ignored/unrecognized radiant heat is beating downwards on houses, as well as horizontally, then roof designs have to change too, as timber battens can catch fire under a red-hot tin roof..

It's hard to imagine even reckless storm chasers being recruited for placing the sensor probes, so perhaps something can be done parachuting probes in, ahead of the firestorm. We dropped probes into and through the hot clouds of Venus, so I guess it is possible...with appropriate funding.

Yours sincerely,

Michael Gunter

Appendix 2. Provenance of Mill Dugout online image

"MILL DUGOUT." design plans, ca. 1948

The dugout plans were found by historian Peter Evans, in the wall of a sawmill office. The office was in the process of being demolished, some time in the 1990s. He donated the plans to the National Museum of Australia (NMA) in the late 1990s, where they have become object number SC0010.0001

A facsimile copy of the plans is on public display in NMA's "Old New Land" permanent gallery.

In March 2009, NMA staff returned a digital photograph of SC0010.0001 to Peter Evans, in the form of a 56MB TIFF image. Mr Evans re-encoded the digital image as a 1.1MB JPEG file with the name *nma.img-ci20092256-001-wm-vs1.JPG* and sent it to me for my research around a proposed submission to the Victorian Bushfires Royal Commission.

Personal email communication from Peter Evans, dated 26th March 2009 states that he regards the image as now being "in the public domain" and he has no objection to me putting the image on the Internet. On 27th March 2009, image *nma.img-ci20092256-001-wm-vs1.JPG* was posted here:

http://www.voltscommissar.net/docs/dugout_plans.jpg

...the name is changed to be more user-friendly, and has had the metadata header modified to now include a "Comment" or "Description" field containing text "nma.img-ci20092256-001-wm-vs1.JPG Peter Evans Collection NMA".

The header modification is to comply with National Museum of Australia requirements that the image be cited:

"Peter Evans Collection
National Museum of Australia
Photograph National Museum of Australia"

The large print herewith [*not submitted yet, at the request of VBRC staff*] has been created by Ted's Camera Store, Elizabeth Street, Melbourne. The brief was for a full size copy of the original document, but a small error in calculation has resulted in the image being slightly larger (1.25%, linear) than the original. The brief was also to improve contrast and legibility by applying "autocorrection" in PhotoShop, and this has resulted in a complete change of hue from the original peachy colour [*the Internet version*], to a blue-green effect.

If any further information is required regarding the genuineness or provenance of "MILL DUGOUT." plans, please do not hesitate to contact me, and I shall endeavour to discover more.

Signed:



Michael Gunter

Melbourne 31st March 2009

Appendix 3.

Hazelwood Coal Seam Fire, September 2008 - Were these emissions added to Australia's greenhouse gas emissions tally? *Note: image is rotated: <- top bottom ->*

