

Integrity and Complex Systems: The Rum Rebellion or the Shearers' Strike?

The political disillusionment that led to the recent change of national government and the passing of the **Australian Federal Integrity Commission Bill 2021 (No. 2)** has focused much of our thinking about public integrity and ethical practice in a democracy. Looking for a definition online I found: *“Political integrity means exercising political power consistently in the public interest, independent from private interests, and not using power to maintain the office holder’s own wealth and position.”*

If you consider the political extremes in our history which, for the purpose of this talk, I link to the 1808 Rum Rebellion and the 1891 Barcaldine Shearer’s Strike, we see how different versions of ‘integrity’ have played out in the Australian story. And, if you’re tempted to assign either of those themes to one or other of our major political parties, it’s appropriate to recall that Jim Carlton was both a Liberal politician and a model of political integrity.

Jim Carlton’s politically ‘Dry’ commitment to free markets and individual enterprise may have to some extent reflected an early training in science and his lived experience of working in business and finance. Behaving with integrity in those contexts requires an understanding of, and a respect for, the underlying realities that in no sense disqualifies any individual from holding views consistent with a broad commitment to compassion and human rights.

Having achieved great financial success, some enlightened individuals dedicate a proportion of their time and money to promoting the search for solutions to major human problems. Working in private and public biomedical research institutes and serving on different advisory boards and committees, it’s been both an education and a real pleasure to get to know a few of these committed philanthropists and ‘angel investors.’

Part of the basic ‘integrity’ that guarantees both freedom and flexibility in any political system is having multiple foci of power and wealth. The lack of that is, in my opinion, why totalitarian systems tend to founder in a morass of corruption and cruelty. We see a prime example of that in contemporary Russia but the China experiment, that emphasizes centralized political control while facilitating entrepreneurial activity and innovation, may be showing us something different.

Commuting regularly from the USA to an apartment in Carlton from the latter half of the 1990’s, then moving permanently to Parkville from 2002, we got to know Jim Carlton as a respected and amiable identity in the local landscape. Having lived a long time in the USA, the term ‘Liberal’ is, of course, identified with ideas about using political power to improve general wellbeing, a theme that we might legitimately regard as being aligned with the ‘small L’ social liberalism of Jim Carlton. He shared those ideals with his former leader, Malcolm Fraser, where they became more apparent after he left political office, and with his political contemporary Peter Baume, who followed Jim as shadow health minister at the time of the first Hawke government.

Malcolm was the product of an established squattocracy that, in the broader sense, we might trace back to the Rum Rebellion. A certain Noblesse Oblige has, of course, long been one of

the better characteristics of some in the landed aristocracy. But, with their economic decline over the past 100+ years or so, that type of integrity may be largely historic.

Returning to the era when Jim Carlton and Peter Baume were political players, those of us who've long been involved in infectious disease research are very aware of how, with integrity and a commitment to compassion and pragmatism, the Hawke government reached across the aisle when, back in the early 1980's, HIV/AIDS hit our shores. Taking the advice of medical and public health professionals, the leadership of health minister Neal Blewett and shadow Peter Baume enabled 'judgement-free' approaches that provided - among other support mechanisms - mobile health clinics and clean needle exchange to help keep the disease out of the drug-injecting and heterosexual communities. In doing that, the politicians stood up to our local version of the Religious Morality Police.

When COVID hit at the beginning of 2020, the national response was also supported by both sides of politics though, unlike the situation in the 1980's, the Morrison government did not reach out to incorporate the opposition in the decision-making process. That bipartisanship fragmented a little as elections approached, but the aggressive response through 2020 certainly saved many lives and likely prevented a lot of Long COVID by holding the line until vaccines, then drugs became available. Death rates in the over 70's were initially around 20% and are now at about 0.1%. In general, my guess is that Australians want to see elected representatives working constructively together as we confront the massive problems facing us.

The statement 'first do no harm' that many would regard as being basic to medical ethics comes from Hippocrates's 'Treatise on Epidemics'. Translated as 'In illnesses one should keep two things in mind, to be useful rather than cause no harm', the insertion of integrity into that equation has led to medical research involving people and/or other warm-blooded vertebrates being scrutinised at the outset by government-mandated ethics committees. Some of you may have served on these Human or Animal Experimentation Committees, which are universally required to have lay representation that reflects the values of the broader community.

Human and Animal Ethics Committees became standard practice for evaluating and monitoring research when we were confronted with the fact that, though researchers may be dedicated to preserving the integrity of the scientific process that requires analysis, measurement and peer-reviewed publication for all to access, observing those rules does not necessarily mean that the experimentalist will respect a broader view of what constitutes ethical practice and integrity in human affairs.

An egregious example is the infamous Tuskegee Experiment, where black American men with syphilis, many of whom were living in family situations where they could transmit the disease, were left untreated when curative antibiotics became available. The clinical investigators, who were part of the US Public Health Service, chose to stay with the 'integrity' of their experimental design rather than to emphasize the 'first do no harm principle' that most would regard as the basis of medical integrity.

The establishment of the NSW colony from 1788 might be thought of as a social experiment directed at the problem of dealing with the criminal element in society. Public sensibilities

had changed and the earlier practice of executing people for minor offences had become less acceptable. That, and the fact that the 1776 US War of Independence had made it more difficult for the British to send their human debris across the Atlantic, had led to the major problem of overcrowded prison hulks in places like Portsmouth. What to do with these undesirables? How might they be put to gainful employment?

The idea of establishing a prison colony at Botany Bay was pushed by Sir Joseph Banks, the politically connected scientist (he would have called himself a 'natural philosopher') who sailed as private citizen (a 'supernumerary') on the 1768-1771 voyage of the *Endeavour*. Banks and Captain (then lieutenant) James Cook were both elected to the Fellowship of the Royal Society (FRS) that, founded in 1660, is Britain's Academy of Science and the parent of our own Australian Academy of Science (AAS). From the outset, the practice of science has been part of the story of European Australia.

The first Governor (1788-92) of the NSW colony, Arthur Phillip, is generally regarded as a man of integrity. He clearly thought of the transported convicts as fellow human beings, regarding their involuntary emigration as a pathway to personal renewal and reform. Those with skills were soon identified and put to useful work building the infrastructure required to establish the new colony. Acting on instructions from the British Foreign Office to negotiate the transfer of land, he attempted peaceful rapprochement with the indigenous people: The legal principle of *Terra Nullius* was not implemented until 1835 and was finally overturned by the 1992 Mabo decision. Will we now have the Integrity as a people to sign on to the Indigenous Voice, a mechanism advanced by indigenous people and endorsed by just about all serious Constitutional Scholars?

Back with the first fleeters: when food became scarce, Phillip mandated equal portions for all. After he returned to England in 1792 because of health problems, Major Francis Grose of the NSW Marine Corps was left in charge. His approach to the food shortage problem was to cut rations selectively for the convicts, end Phillip's attempts at collective farming and make generous land grants to the officers with the convicts supplying free labour. The members of the NSW Corps, which officially became the 102nd Regiment of Foot (the Rum Corps) in 1808, prospered and became, in effect, a *de facto* colonial administration. Due to a shortage of coins, rum became a major currency, with production and sale being substantially controlled by the military. That was, as might be expected, both a focus for corrupt behaviour and a constant cause of tension between these new 'landed gentry' and colonial Governors, appointed by the British Crown.

A leading figure in the colony, and in the 1808 rebellion against Governor William Bligh, was pastoralist and entrepreneur John Macarthur. A former army officer who arrived in the colony of NSW in 1790 and served until 1796, Macarthur soon secured land grants of some 200 acres in the Sydney area. When a flock of Spanish merino sheep was sold off in the then Dutch Cape Colony, he managed to secure a few breeding pairs. Macarthur took some of his Australian grown Merino wool back to the UK in 1802-3 and is generally credited with founding the Australian fine wool export industry.

A man who could not tolerate anyone in authority who threatened his self-interests, Macarthur played a central part in the rum rebellion. Bligh had moved to reverse the expansion of Macarthur's by then extensive land holdings, which were then measured in the thousands of acres. Bligh had to go!

The upshot of the rebellion was that Bligh returned to England and Macarthur, and others, who had seized on the available opportunities continued to prosper and help build the commercial viability of the developing colony. So that's one face of the Rum Rebellion/Rum Corps, the emergence of an at-times ruthless (even murderous) entrepreneurial spirit that facilitated the development of Australia's pastoral industries. When I was a child and adolescent in the 1940's and 1950's, Australia (especially at the time of the Korean War) still rode 'on the sheep's back'.

What do the 1809 Rum Rebellion and the 1891 Shearer's Strike have in common? Beyond the tensions between the powerful and the powerless, the answer is, of course, sheep. Collective action on the part of those at the bottom of society had emerged from time to time in Britain with, for example, the labour shortages following the 14th century black death (plague, caused by *Pasturella pestis*) leading transiently to better conditions for the rural serfs. Those gains were soon reversed by the Barons and the resultant Peasant's revolt was crushed.

Moving to Australia, the 1804 Castle Hill 'Rebellion' by (largely Irish) convicts in the NSW colony led to 9 executions and other severe punishments, while none of the land holders and serving army officer participants in the 1809 Rum Rebellion were even prosecuted. Perhaps our first trade unionists were six English farm workers, the Tolpuddle Martyrs, who were transported in 1834 for banding together to protect their already meagre wages. The Australian Labour movement celebrates the Eureka Stockade, the 1854 Miner's revolt on the Ballarat gold fields, though many of these men were individual entrepreneurs who, hoping to make it big with a gold strike, were likely acting more in the spirit of the Rum Rebellion!

By 1891, labour shortages due to the defection of workers to the goldfields had facilitated the early emergence of trade unions in Australia, with the Barcardine Shearer's strike being a dispute between union (The Amalgamated Shearer's Union of Australasia) and non-union labour that was exacerbated by the actions of some of the local pastoralist pioneers. The strike failed when the unionists (who flew the Eureka flag) ran out of food.

Large numbers of soldiers were sent to protect the landowners and non-unionists, and 13 of the union leaders were sentenced to jail terms. On 9 September 1892, the *Manifesto of the Queensland Labour Party* was read-out under the Tree of Knowledge at Barcardine for the newly formed Australian Labour Party (ALP). Three of the 13 unionists who were imprisoned subsequently became ALP parliamentarians and, in 1899, Queensland had the first Labour Government (it only lasted 5 days) in the world. Themes from the strike are also reflected in the wording of Banjo Paterson' poem *Waltzing Matilda*, which many would have preferred to see as our National Anthem.

Of all the hooved species Europeans brought to Australia, sheep, which gnaw at pasture and disrupt both roots and soil, have been a particular disaster. **Ecological integrity** is about 'maintaining the diversity and quality of ecosystems and enhancing their capacity to adapt to change and provide for the needs of future generations.' Australia's fragile ecosystems and unique species of plants and animals could have done without, sheep, pigs, cattle, wild pigs, brumbies, feral cats.....and so on.

Involving indigenous custodians who draw on traditional knowledge makes a lot of sense when it comes to restoring the integrity of the Australian environment, but it's also the case that plant and animal diversity within these ecosystems has been massively altered by species introduced over the past 200+ years. Systematic approaches based in modern science are also essential as we do our utmost to restore soil, pasture and forest integrity. And we will continue to benefit from practices implemented by agriculturalists who know their land and embrace sustainable strategies.

When compared with the USA, the availability of high-quality agricultural land with substantial soil depth is very limited in Australia. The exploitation of land and property is still central to our economy. We continue to concrete-over farmland to build big houses that are expensive to heat and cool and are undersupplied with basic services. Australian and US citizens inhabit, on average, the largest houses on the planet! In view of recent events, have property developers the Integrity to stop building on riverine flood plains and in coastal areas threatened by storm surge and sea-level rise? Are regulatory authorities equipped with the powers and personnel that allow them to act with Integrity in this area?

Talking about buildings takes us to a different discussion of Integrity. '**Structural integrity** is an engineering field that helps ensure that either a structure or structural component is fit for purpose under normal operational conditions and is safe even should conditions exceed that of the original design that is basic to engineering'. Apart from design, this also focuses on materials. Concrete formulations are, for example, subject to compression stress tests.

As we are all aware, some recently constructed high-rise buildings here, and in other countries, have failed badly from the aspect of structural integrity. Imported steel certified to appropriate standards has not behaved as expected and many buildings have been clad externally with flammable, imported panels and internally with defective plasterboard. Part of this reflects that **materials integrity** depends on both the integrity of the manufacturers and of the regulatory frameworks in countries where these products are made. Offshoring integrity is dangerous!

While we're acutely aware that the COVID-19 pandemic has tested the underlying integrity of our current economic and financial models, our infinitely greater concern must be with the inexorable progression of climate change. Economics, finance and politics are human constructs subject to change. But the integrity of the Laws of Physics and Chemistry is absolute.

The practice of science is also a human construct. The integrity of earth systems science depends on measurement and numbers. That integrity of that analysis has been rapidly advanced by the increasing sophistication of the underlying technology, from ocean sensors, to balloons, to satellites, to supercomputers and so forth.

And it's not the integrity of the planet that's threatened by climate change. Rocks aren't compromised by being covered with an additional 70 metres of seawater, which is what will happen if all the ice on the planet melts. If you're thinking about Melbourne's bayside suburbs, that's the height of the pavement of the Westgate Bridge!

Here are some robust numbers.

The population of the planet was about one billion in 1788. That had grown to 3 billion by 1960 and is now around 8 billion. In short, human numbers have increased 8-fold since the *Endeavour* set out on its voyage of discovery and have at least doubled in the lifetimes of many in this room. The more prosperous we are, the more we consume and the greater the amounts of greenhouse gases that are pushed into the atmosphere.

Records derived from ice core analysis show that the CO₂ concentration in the atmosphere from 1750 to 1800 was around 278 ppm. As the coal-fired industrial and transport revolution progressed through the 19th century, that rose 13 points (to 291 ppm) by 1900. By 1960, the number was 317 ppm. In 2012 we were at 394 ppm: we have now hit 420 ppm, adding 26 ppm in a decade. Calculations indicate that, in billion tons of CO₂, we added 0.02 in 1790; 1.95 in 1900; 9.39 in 1960 and 36.6 in 2022. We are looking at a process that is progressive, cumulative and inexorable.

There is no reason to doubt that either the science of climate change, or the scientists, lack integrity. The minimal science literacy of many in the broader community is an issue. Scientists don't speak from a position of dogmatic authority. Some find it disturbing that scientists state their findings as 'our best understanding is that'. Climate models present us with a spectrum of possible outcomes related to the continued levels of greenhouse gas emissions, not with definitive answers. Take a look at the YouTube video describing the 2021 Nobel Prize for Physics <https://www.youtube.com/watch?v=LJJoPCTgpQI> .

Models are 'thought experiments,' with their integrity being determined by the comprehensiveness of the data sets that support the underlying assumptions. Modelling has been central to the great improvements in short-term weather predictions. Taking that out to the longer term for climate prediction could be enhanced by moving the analysis from a 100 km to a 10 km grid. Requiring much greater computing power, that would be expensive but doable with current technology.

With climate change, the science of cause is based in the expertise of people trained in the physical sciences, the atmospheric physicists, the meteorologists, the oceanographers, the glaciologists, the cloud physicists and so forth. But when we look at the consequences for sustaining the integrity of complex life systems, much of that rests in the biological sciences. That also includes the palaeontologists who, linking the study of rocks and life, analyse the deep history of plants and animals in the fossil record. The fossil fuels that we continue to burn with such massive disregard are, of course, all derived from flora and fauna that have been buried in the earth's crust.

A major concern, is that the most superficial of those layers, represented by the permafrost in the far north of the planet, is already releasing substantial amounts of methane (CH₄) into the air which, as ice-melt accelerates with progressive warming, could make any remediation we attempt other than taking CO₂ out of the atmosphere (a massively expensive enterprise) essentially futile. Though it breaks down to CO₂ and H₂O in about 11 years, CH₄ is a much worse greenhouse gas than CO₂. This is the 'tipping point' that climate scientists fear.

Though we can and should criticize politicians and we love to point the finger at other countries, our only real power rests in the individual moral and intellectual integrity that determines what we do and how we vote. But this problem is far too big to be solved solely at the level of individual action and commitment!

Leadership and innovation in both the public and the private sectors, in economics, in finance, in education, in access to good information and in science and industrial development is essential if we are to access the products, processes and practices that move us beyond fossil fuel dependence. And we need to tap all Australia's human talent, whether that comes from the Rum Rebellion or the Shearer's Strike lineages, by ensuring equality of opportunity and a focus on skills, solutions and merit across society.

Climate change is a global problem that is not constrained by passports, regional priorities or national boundaries. The charge of eminent microbiologist and humanist Rene' Dubos to 'think globally act locally' has never been more apt though, with the internet and social media, we can also 'act globally'.

Back in 1988, the UN Environment Program (UNEP) the World Meteorological Organization (WMO) got together to establish the Intergovernmental Panel on Climate Change (IPCC), which brings the full spectrum of expertise, across the physical and biological sciences, geology, economics and the social sciences to bear on the problem of global warming and climate change. To date, informed professionals across the planet have looked at peer-reviewed published data to produce six IPCC reports, which have become ever more comprehensive and alarming, though the authors try not to be alarmist.

The latest, and most accessible for general readers is the 2022/3 AR6 Synthesis Report for Policy Makers <https://www.ipcc.ch/report/sixth-assessment-report-cycle/> which is still in the process of being edited. Representatives of the 195 member governments sign off on these Synthesis reports, so they tend to err on the conservative side. Greater detail can be found in the individual, specific reports.

How effective has the IPCC process been when it comes to driving real change? The answer is, not at all: through the 12-year interval (1995 and 2007) between AR2 and AR4, annual emissions went from 23.4 to 31.5 billion tons. China, with a population of 1.45 billion, is currently responsible for 30% of global emissions, compared with 75% for the G20, which includes China and Australia.

Many Nation States and, indeed, large corporations have shown a willingness to move forward, with an increasing number (including Australia) signing-on to the goal of reaching net 0 emissions by 2050 or 2060 (China), though few have enacted the necessary legislation. The emission numbers are for CO₂ 'equivalents', with the contribution of other greenhouse gases like CH₄ and N₂O being calculated via conversion factors.

Will we have the integrity to incorporate all the appropriate data in our emissions reporting? For example, the TROPOspheric Monitoring Instrument (TROPOMI) onboard the Copernicus Sentinel-5 Precursor (S-5P) satellite launched in October 2017 is providing new

data on CH₄ release across the planet, with Australia's Bowen-basin coal mines being very substantial contributors. Will that be recorded as part of our domestic emissions profile?

We can, of course, focus on the integrity, or otherwise, of individual governments. We could debate whether it's possible for any group of nation states to co-operate at the level of Integrity that is required to move the current metrics in the right, and safe, direction.

When we get down to it, the absolute measure of integrity re action on climate change mitigation rests with two sets of numbers, the rate of decrease in annual greenhouse gas emissions and the stabilization, then fall of greenhouse gas levels in the atmosphere. Those numbers are being acquired with high integrity measurement systems by people of high integrity, and they can't be fudged. As physicist Richard Feynman said: 'For a successful technology, reality must take precedence over public relations, for nature cannot be fooled.' The realities of physics cannot be moved by the comforting distractions and self-delusion of realpolitik. Can humanity act with the necessary integrity?

Peter C Doherty, 19 April 2023