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Physicians & Scientists for Global Responsibility

# When does science become propaganda?

## WHAT DOES THIS SUGGEST FOR DEMOCRACY?

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**Image: The New Coalition, Punch, 1855.**

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## EXECUTIVE SUMMARY

For two hundred years, global citizens have witnessed the ascent of scientific and technical information to become a key instrument in government decision-making. Over this time prominent scientists and scholars have issued warnings that scientific and technical information might not be the apolitical, impartial policy tool that it is typically represented as. Their warnings, that scientific information can be political and self-serving and not serve the wider interest of society, should be heeded.

This paper seeks to encourage a discussion on a topic that is important but neglected. Information and intelligence used for policy and law in society, if it is to benefit society, must be impartial. Where there are financial or political conflicts of interest, there must be areas of resourced expertise that can act as a counter to those interests, so as to make decisions in the interest of society.

This is a normal, uncontested expectation. A key charge of capitalist democracies is to prevent abuse of power. Unfortunately, our governmental systems are information-poor because public science and research systems do not provide monitoring, research and scientific resources for broad environmental and health-based issues. Policies and guidelines are all too often constructed on what a department wants, and what stakeholders desire but they are not buttressed by methodological reviews of existing published information – local or global - relevant to the policy. Access to independent scientific and technical information is fundamental for the formulation of public interest policy, but the institutions that should provide the impartial experts have been redirected to fulfil different science and policy goals.

However, the information used by government and regulatory agencies to justify and approve market access for technologies is by convention not independent, but rather unpublished industry data. This data is kept secret by commercial in confidence arrangements. The technical guidelines are established with heavy industry involvement, and they habitually ignore the weight of evidence in the scientific literature.

Western governments should allocate resources to ensure the production of scientific and technical information that can triangulate the claims of commercial institutions, and ensure the published literature is reviewed by government scientists and regulators, but they do not.

This is a big problem, as the integration of technologies into public life, and the stewardship of them, is a major part of parliamentary and public agency activity. Scientific and technical information is broadly integrated in policy. This information might be used to claim safety of a particular exposure level of a technology, or justify the integration of new technologies into the back end of governance and administration systems. However, the processes of assembling and justifying that information, do not reflect democratic principles of accountability, transparency and impartiality.

This is the situation western nations including New Zealand find themselves in, in the early twenty-first century. The problem is escalating and is not easily remedied. The problem extends beyond captured regulatory institutions, to policy development, academia and media. Global policy shifts have repositioned public research policy and funding to prioritise production and commercialisation.

Historically, institutions which secured the favour of a monarch or ruler would financially and politically profit. Commercial institutions dedicate resources to fostering collegial relationships with government agencies, ensuring officials have all the information the inadequate regulations require to secure approval for market access for modern technologies, or to license products that will be integrated into back-end systems.

Modern societies do not fund science which might act as a counter to industry claims. The key information circulates between policy-makers, regulators and the regulated industries in closed loop systems. In closed-loop regulatory environments officials aren’t required to review the broader scientific literature and update their position on risk. The industry actors have the expertise, and the public sector is

dependent on industry expertise. Expertise and science uncontested may more accurately be described as a form of propaganda. The relationships, the company data is in place to secure market access. When there are public consultations, agencies do not account for corporate conflicts of interest. The public are then exposed to the technologies. However, the data used to claim safety, cannot be described as impartial.

Monitoring, research and dissemination of scientific and technical data for public good purposes by universities and research institutions is rare and ad hoc. Management and funding scopes do not extend to permissions for long-term, interdisciplinary research to shed light on harm to human or environmental health risk from technologies and non-greenhouse gas emissions. Official priorities steer funding committees to prioritise innovative research, where end discoveries may be commercialised. Institutions are tasked with securing industry partners. Key elites such as management and key scientists carefully guard these revenue streams.

A public sector which is curtailed or corrupted in this way will struggle to appropriately inform Parliament, the judiciary and the media in moments of controversies. Controversies often concern issues which are ambiguous, complex and uncertain [1]. They might contradict long-term policy positions.

Science advisors are not tasked to recognise and take account of scientific and technical information which might have financial and/or political conflicts of interest. Often, their terms of reference restrict their capacity to inquire, and they have few resources and no time for broader reviews.

The processes – regulatory guidelines; commercially oriented public institutions; and narrow policy scopes; alongside short-term funding channels, creates significant barriers to broader scrutiny of the safety of technologies and their emissions and effects. This narrows the gaze of officials, and encourages short term, technical approaches, even as more and more technologies are deployed.

These actions contradict constitutional principles, which require that officials consider relevant information. Principles in law might require that officials act to protect human and environmental health. However, unless there is scope for broad, critical inquiry, where officials are required and funded to review broader, including politically contradictory or controversial information, such activities will not occur. No-one is required to know, and so no-one knows.

Essentially, these processes corrupt taken for granted democratic norms. Often, purely technical decision-making is inappropriate. Instead, broader interdisciplinary expertise might have more capacity to draw attention to a range of uncertainties, out of this comes judgement which might protect more vulnerable groups, including pregnant mothers and children.

Our societies now broadly lack independent scientific and research experts who have the authority and confidence to contest industry positions, or central government policy, when controversies around risk erupt in public environments. All too often these controversies are not framed as public issues involving science. Because broader expertise is not available, they become framed as ‘scientific issues’ [2].

More frequently these issues instead involve public values; how we weigh risk and harm; and the resources and power, or freedom, that is granted scientists and researchers to undertake this work.

> ‘The production of scientific knowledge is much more politicized than most people realise’ [3].

Broad categories of technologies, with emissions and/or ‘off-target’ effects – are recognised as potentially risky or harmful by experts who publish in respected journals. Yet repeatedly and persistently, the discordant or contradictory new scientific or technical information is rejected, batted away through discourse and practice.

These democratic deficits apply across a broader range of technologies than is commonly recognised. Patterns involving opaque policies, and the failure to be procedurally and scientifically accountable and

impartial are evident. Informational gaps, outdated paradigms, and a failure to consider published scientific literature on risk and harm might concern the biological safety of a chemical; a biotechnology; nanotechnology; a radiofrequency spectrum; geoengineering technologies or the adoption of digital governance systems and AI technologies into these systems.

When these controversies erupt, it is increasingly common to observe across the media, across academia and among technical experts, swift rebuttals and dismissal of public claims as mis- or dis-information. Groups seeking to draw attention to an activity can be smeared as 'anti'. Their calls for attention to an issue can be marginalised and particular issues ignored. The smearing sends a chilling effect to other citizens, not to become involved in a politically controversial issue.

Yet the scientific and technical information is designed for a political purpose, to secure entry onto a domestic market. When it is non-contestable, when there are not obvious impartial arbiters, when the public more often identifies government claims as biased towards a commercial institution, it is not surprising that society becomes polarised.

Such scientific and technical information serves the political and financial interests of the institutions that produce it when it is not subject to democratic scrutiny. When it is taken for granted as facts by political and bureaucratic elites, and used to convince society of safety, may be better classified as propaganda.

This issues paper draws on many New Zealand-based examples to highlight the persistent decoupling of the research, science and information system from research trajectories that might challenge or contradict powerful interests. However, this governance problem of capture is globally recognised. The dilemma in front of us extends beyond technologies, health and the environment. New Zealand research and science systems have been substantially eroded, some might say captured, so that New Zealand lacks the healthy, resilient informational systems – the intelligence - to support public knowledge, guide Parliament, government administration and the judiciary.

It's necessary that these issues are broadly discussed and debated, as ignorance not only renders society powerless to reversing health harms and reversing the erosion of valuable resources, but ignorance increases potential for human rights abuses.

The ways governments and regulators design policies, and declare technologies are safe for public use, deserves much wider public scrutiny, if we are to remedy current trajectories of worsening health, corrupted political processes and civic disengagement.

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Physicians & Scientists for Global Responsibility

**New Zealand, August 2023.**

## 1. THE REGULATOR SAYS IT'S SAFE

For decades, communities of concerned citizens and expert communities cautiously and carefully methodologically review and present the scientific evidence of harm from a technology in public forums to the politicians representing their interests at local, regional and central government level. But after consulting with officials or the regulator, the elected politicians come back to them and declare that – 'the regulator says it's safe', or the policy remains unaltered. The case is then closed. The concerned publics are dismissed via chains of officials who act as informational gatekeepers.

The scientific and scholarly literature is replete with descriptions of civic struggles as citizens and experts contest private industry supplied information and brittle policy processes that by not reflecting changing knowledges, ultimately defer to industry authority. These descriptions aim to contribute to the record and signal publicly, the complex issues which remain outside regulatory consideration [4, 5, 6, 7, 8, 9, 10]. The technology might be a chemical or formulation [11, 12, 13]; a novel biotechnology [14, 15, 16, 17]; geoengineering [18] [19] [20]; digital governance infrastructure with AI [21]; or it might be wireless radiation [22, 23, 24].

No matter the extensive, elegantly produced, damning and eye-raising scientific research that would come after – such 'out of scope' scientific research studies are persistently dismissed as non-guideline; or irrelevant, while calls by expert scientists are met with silence.

Yet what is consensus, if the data is paid for by corporations with a financial conflict of interest and if governments actively suppress politically inconvenient and contradictory information?

Pick your technology and you'll see a familiar pattern. Government officials judge safety based on sets of technicalities which revolve around the revision of linear toxicological science supplied by the relevant industry and limited modelling scenarios [25]. These specific studies enable the regulator to approve an acceptable level of risk or tolerance by humans of the technology. The product is then released onto the market. Commercial in-confidence agreements ensure the public cannot access the information – the market-science - which ensures market access for the technology. Monitoring and research are not undertaken to understand and update regulatory scientists on real world risk [26].

The private industry studies which fit inside the rules can be decades old and still support existing standards, no matter the contradictions in the scientific literature. For example, the World Health Organizations' [27] current safe level for the herbicide glyphosate in drinking water is derived from an unpublished Monsanto study, set in 1985 [28]. Hundreds, if not thousands of studies in the scientific literature suggest that this herbicide is more harmful than presumed by chemical regulators. Extensive information has been unearthed in court cases. Yet there has been no revision of guidelines nor a budging of the claimed safe level in drinking water.

This information produced for the purpose of market access may be described as non-consensual, organised persuasive communication (propaganda).

> 'For the information to be consensual it must contain the relevant information that can allow a rational and informed decision to be made… critical information should not be omitted or distorted in a way that leads an individual to be persuaded when otherwise, with the included or undistorted information, they would not be.' [29, p. 11]

Our governments play a role in maintaining the status quo. The formalised rules and guidelines used to decide whether information is suitable for market access (or re-authorisation) purposes conventionally fail to impose obligations on government officials to also review published scientific literature. Officials and regulators are not required to consider court findings nor consider the risk from rapidly scaling up new technologies and then releasing them [30, 31]. Officials ignore and dismiss harm at

endocrinologically relevant low-doses [32, 33], and other harm pathways, including mixture effects [34, 35, 36, 5, 37] and antibiotic effects [38]. Chemicals are withdrawn and replaced by 'regrettable' substitutes with similar characteristics [39]**.** [40]

These gaps impact the ability to address big problems. Current 'inequality' and 'equity' tropes skate over the greater health burden suffered by low-income communities and the role of government agencies to limit harm [41]. From workplace exposures; to malnutrition from ultraprocessed diets; to detecting industrial and polluted sites [42, 43, 44, 45, 46], these issues are more difficult to identify and then remedy when robust, independent information is lacking. In New Zealand, it is easier to get livestock tested for toxic exposures than a recently exposed child.

Legislation and guidelines promote regulatory capture by ensuring that governing bodies and regulatory agencies are reliant on industry funding *and* are underfunded [47, 48, 49]. Governing bodies and regulators consequently by default arrange their activities around the service of granting and sustaining market access to their related industries.

The barriers to public appeal in New Zealand alone are extraordinary. Without scientific debate and scrutiny, and review across different domains of expertise, there can be no truth in the claim that a particular technology and/or its' emissions are safe.

All too often, regulators are not given broader powers of inquiry, and the resources to carry out that inquiry in a fair and balanced way.

Judicial review of decisions which are inconsistent with principles in legislation do not happen. Court cases debating technical points might occur, but judges detest dealing with value-laden scientific controversies.

The absence of independent scientific communities also leaves judges, select committees and officials who might consider broader notions of risk, deferring to the very officials who may be heading the policy agenda. The very actors who are most likely to have a political conflict of interest. Their institutions may believe that the release of the technology will contribute to their institutions' goals; or as regulators they may have long-term relationships with the corporations seeking approval for their technologies. Yet in a court case the judges will defer to their expertise as Crown agents.

**Regulators may come to view the world the way firms do, not because they have been captured through incentives, but because they have been convinced.**

**Dal Bó (2006)**

These factors combine to produce a slanted weight of information supporting the market access and widespread integration of a given technology. Information is intelligence, yet it is geared to private industry selected and supplied intelligence.

However, it is not private industry that we should blame. It is a failure of governments to recognise the potential for abuse of power by highly predatory commercial interests and put in place governance architecture and resourcing which might counter-balance this power. It is the failure to lock in principles, and educate officials on how to make decisions in ambiguous, complex and uncertain environments, in the public interest.

The consequence in play in the early twenty-first century, is strategic, organisational communication across governance and regulatory landscapes which leave little space for controversies that contradict commercial priorities. In 1942, Talcott Parsons highlighted how institutions mesh or integrate with social environments to produce an interdependence. These institutions could not be considered in isolation.

> ‘Institutional patterns consist of norms defining what action and attitudes are legitimately expected of people, they are, in one aspect, actually part of the cultural tradition.’ [50]

The microprocesses, the patterns across the policy, science, and media communities can be studied to identify how central dogmas are produced and enforced. Laura Nader theorised that institutions at multiple sites cultivate and maintain central ideas of accepted taste and value. Nader described these controlling processes as:

> ‘the mechanisms by which ideas take hold and become institutional in relation to power.’ [51]

Controlling processes keep published scientific literature at arm’s length, even while scientific outcomes are heavily associated with the priorities of the research sponsors [52, 53].

This organised persuasive communication implies expert consensus. However, these practices inevitably deceive the public on safety, because contradictory science is excluded from official consideration. It theoretically justifies to the public that the technologies that society are exposed to in daily life, which society must accept, are safe.

Democracies are tasked with preventing abuse of power. The way governments achieve this is through requiring officials to act transparently and accountably. However, when it comes to information used to claim safety of technological inventions, processes of transparency and accountability are jettisoned.

## 2. PRINCIPLES: ALL TO EASILY SIDELINED

Principles are important. These societally accepted value-based systems of belief act as rails to guide reasoning. Principles are inimical to reasoning and therefore judgement. Such as in judging who, how and why a child is at greater risk of harm from a particular exposure, or mix of exposures, than their parent.

When officials lack flexibility to review new information and transparently uphold societally agreed upon, public good principles, ruling dogmas lock into place. It is no matter that the rules and guidelines used by regulatory agencies are brittle and way past their due date. Society is still, like stale cakes served up by a stern aunt, required to compliantly accept the official findings and decisions.

**In democratic societies, public truths are precious collective commodities, arrived at, just as good laws are, through painstaking deliberation on values and slow sifting of alternative interpretations based on relevant observations and arguments.**

**S.Jasanoff (2017)**

Across all these technologies, policymakers overlook high level principles which should guide consideration. Legislation may require that officials use the precautionary principle but there is no guidance for officials to follow the precautionary principle. Officials require transparent guidelines to support precautionary decision-making in moments of uncertainty, but such guidelines are not established, for example in hazardous substances regulation [47]. When controversial decisions might contradict the status quo it is more difficult for lower-level officials, when there are strong industry relationships in place and key elites support private industry positions [54] [55].

Instead of principles and values-based science and scientific analysis, a panoply of microprocesses fill that gap, persuading us to acquiesce. Microprocesses effectively subvert values-based consideration, via

technical rules and guidelines. Scientific facts become a function of technical processes, and real-world science and real-world uncertainty – truth - are excluded.

Basic human values and principles persist [56]. After a lifetime of studying regulatory policy, regulatory and scientific communities, and lay publics, sociologist Sheila Jasanoff [57] has shed light on why scientific and technical controversies often simply won't go away:

> 'the sufficiency of truth claims has been accepted in the Western public sphere only when associated issues of public value and purpose were addressed in tandem.'

Jasanoff helps us understand that despite the perspectives of policymakers and regulators, societal values persist:

> 'The durability of public facts, accepted by citizens as 'self-evident' truths, depends on the procedural values of fairness, transparency, criticism, and appeal.' [57]

Values are built into the ethos of science. The Mertonian [58] ideal of science theorised that science was based on objective and impersonal criteria (universality); where the fruits of labours arise from a communal collective effort; where the scientists were disinterested, rather than vested in a particular outcome; and where scientists approached their work methodologically, with a detached 'organised skepticism'.

The Mertonian ideal has always been contested, but it is propagandised through science rhetoric in society and culture. For lobbying has:

> 'progressively moved from just appropriating science all the way to influencing the relation between science and regulation, the governance of science itself, and ultimately science and society.' [55]

This occurred in the late nineteen-nineties with dramatic shifts in political-power. Almost in tandem, massive industry consolidations occurred at scale and pace; and central governments pivoted to directly prioritise science and research for innovation, locking innovation discourse in policy. [59] [60] Tightened funding budgets directly resulted in the defunding of funding proposals which didn't fit innovation-based funding scopes.

This shift was a major strategic gain for stakeholder capitalism.

## 3. THE IDEOLOGY OF INNOVATION

Why is innovation so important? As the government of the United Kingdom enthuses:

> 'Innovation is central to the largest challenges the world faces, from climate change and the ageing society to global pandemics.' [60]

Innovation is politically viewed as the key to economic growth, prosperity and wellbeing. While the level of patent applications is an accepted proxy for economic growth [61].

Innovation cultures support corporate endeavour, rather than contradict it. Political systems – government systems – have tilted to directly support corporate aims through policy, discourse, and action. On the surface 'innovation' appears as a creative term. It's much more than that.

> 'An **innovation** is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process).
>
> **Innovation activities** include all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm.' [62]

Innovation ideologies direct science discovery to identify opportunities that can be commercialised in some way. Given this global ideological slant, it is not the protection and maintenance of democracy facing institutions; their capacity to monitor and manage information in order to guide governments to keep populations safe and prevent abuse of power; counter tyranny; and protect and sustain resources that are central to the largest challenges the world faces.

It is the development of new or improved products or processes.

Innovation is regarded as so important for New Zealand that the entire science funding system is lodged inside the Ministry of Business, Innovation and Employment. The economic growth Ministry. In kiwi-land it is not only business, but public and health research policy that depends on OECD definitions to ensure that health research is 'innovative' [63].

For innovation idealists, it is our *lack of innovation*… rather than a failure of principles and regulation that lead to existential crises.

Within such an ideology, existential risk does not arise from commercial in confidence arrangements and licensing incentives involving dual purpose technology [64] [65] or the global failure to monitor and research chemical and biotech emissions. [66] Nor does risk arise from ultra-processed food and the double-edged human and environmental burden [67] [68] that then amplifies risk from respiratory pathogens [69]. Nor does it arrive through corporate consolidation [66] and the hijacking of public institutions for private purpose [70] [55].

When science is the solution to our 'largest challenges,' policy and culture nudges society to look downstream, to tech development rather than upstream to the all-too-human drivers of wicked problems [71].

Private industry experts often outstrip regulatory scientists and policy makers in expertise. But the decline of resources supporting public sector basic scientific research, directly amplified the power of industry-paid market-science. The capacity to undertake research which might have been contrary to government and industry policy was removed when funding streams became directly targeted to specific innovation-relevant projects and had to be directly approved by funding panels.

Thirty years of funding priorities have directed research away from basic research, and to applied research tied to economic incentives [72, 73]. Contemporary research systems are directed, through funding policy to prioritise the identification and development of technical solutions, their patenting and licensing and marketisation. The agency that oversees research, science and innovation in New Zealand is the Ministry of Business, Innovation and Employment (MBIE). Science is not value free but required to be consistent with the agendas of the MBIE and broader central government [74].

Scientific knowledge is a function of the economic, historic, cultural and social processes that foster particular forms of knowledge. [75] [76] [77] [78] The shifting in New Zealand to management cultures and funding pressures to produce an innovation, a patent, and intellectual property (IP) that are viewed as providing an economic benefit, have crowded out more public good science that potentially draws attention to harms from economic activity [79] [80]. These authority relations [81] [82] inhibit discovery in universities [83] [84] of scientifically relevant information that might contradict economy-focussed institutional principles and priorities.

Funding for scientific research is difficult to secure. Physical scientists in public research institutions recognise that substantial public good research is unlikely to be funded unless IP can be extracted at some stage. They understand that funding committees take into account innovation when prioritising who will receive funding. Precarious funding environments also limit the extent to which university academics and scientists are prepared to take politically controversial positions that might antagonise colleagues; and funding and career opportunities.

Ultimately innovation priorities direct research away from long-term scientific monitoring and discovery that might enable officials and experts to counterbalance and triangulate private industry data. Government agencies persistently fail to require that such work is done.

This is how 'science' and 'politics' wind around each other at the level of policy development, in legislation, and in regulatory and research environments. Inevitably, legacy media then act to uphold the status quo.

The end result is the non-production of scientific knowledge [85] and undone science.

> 'Undone science refers to a situation of unequal power that involves a conflict between reformers, such as social movement leaders, and industrial and political elites, and that is associated with absent knowledge… undone science draws attention to a kind of non-knowledge that is systematically produced through the unequal distribution of power in society.' [86]

This includes the failure to monitor and research synthetic chemicals and biotechnologies released into the environment. Arguably, one of the great global policy failures of our time [26]. The result is ignorance – across society, governance and law.

Ignorance isn't necessarily accidental. Institutions can engage in strategic activities to deny and dismiss uncomfortable information such as by threatening existing scientific findings, which contradicts institutional principles and priorities. Institutions can also divert attention away from the uncomfortable information, or displace and distract by altering the focus such as to models and simulations rather than real world harm. Ignorance can be recognised as a necessary social achievement [87].

**'evidence can become a currency, which lobbyists use to purchase political leverage. This is due the asymmetry of knowledge and research resources between the corporate powers and regulators or politicians: an individual congressmen or woman, a staffer or civil servant may lack the information, often the crude data, which would be needed to design policy options. In these situations, the friendly lobbyist, provided with both, gains access and leverage.'**

**Saltelli et al (2022)**

## 4. SCIENCE ADVISORS: OVERLOOKING FINANCIAL CONFLICTS

Science advisors are presented as 'honest brokers', as independent, impartial experts who are tasked to provide scientific advice in the public interest. However, these advisors are not required to consider the financial and political conflicts of interest in the information that is supplied to them. It is rare to see these advisors broadly review the literature on risk on a particular topic. Often they will produce a paper, or report, but they do not methodologically review the science. All too often, insufficient funds are available for such activity.

The United Kingdom [88, 89, 90, 91] and New Zealand [92, 93, 94, 95, 96] governments do not provide science advisors, so-called 'honest brokers', with guidance to account for bias in industry supplied data for policy purposes. Nor are science advisors required to methodologically evaluate the published literature, as the informational environment changes, in order to appropriately weigh and balance private industry claims.

**No science is immune to**

Without such processes in place expert groups can remain dependent on industry information, particularly in acute and emergency situations and cherry pick information which can reflect broader agendas.

Advisors must declare their own conflicts of interest, However, often conflicts-of-interest may not be so transparent when scientists are publicly portrayed as impartial, but their work, or that of colleagues, involve discovery that will lead the sale (assignment) of IP or to income from royalties. In New Zealand this income goes not to the individual, but to their employer. Such scientists are presented as apolitical, when they are not. Somewhat contradictorily, organisations which might contest claims by scientists who work for such departments, can be represented as lobbyists, when they have no financial conflicts of interest [97].

Former science advisor to the New Zealand Prime Minister, Sir Peter Gluckman discussed the problem of bias and conflicts of interest in decision-making a decade ago [98]. Gluckman has urged that external advice should be regarded critically, noting that:

> 'steps need to be taken early on to ensure that the scientific advice is
>
> - focused on the data and its appropriate interpretation;
> - unbiased with respect to its use of data;
> - open about what is known and not known;
> - able to communicate in terms of probabilities and magnitude of effect;
> - free from conflicts of interest, provided apolitically and independent of any particular end-user perspective.' [99]

Unfortunately, no work has been undertaken to formalise such a process in the years since.

The science advisory sphere extends out to the use of technical advisory committees; to the experts tagged by science media centres; and scientist cohorts, such as when Royal Societies conduct a research project. Only the most senior, established scientists in honorary or emeritus positions are likely to offer counter-debate, often at the expense of peer relationships. More frequently, comments from scientists in science communication would at most, only mildly contradict the State's perspective, for fear of reputational risk.

As such, these science experts are unlikely to challenge established policy positions, nor critically evaluate old science as information changes.

## 5. PRIVATE INDUSTRY EVIDENCE AS PRIMARY EVIDENCE

The barriers to securing an approximation of 'truth' are insurmountable for most people with busy lives and their own trials. It is socially tricky to bring up 'controversial issues' among friends and family when they are likely to be branded an 'anti' for contradicting the 'weight' of evidence or a consensus perspective.

When a vast investment in science to prove the safety of a technology and its emissions is undertaken by the corporate sector, and no countervailing investment in monitoring and research is undertaken by the public sector to counterbalance corporate claims – society may be considered to be inevitably deceived by a perverse asymmetry.

Talking about contradictory, controversial, open-ended issues is difficult. Personal values, experiences and heuristics encourage people to formulate and to present their thoughts in a certain way.

At a gathering of friends or colleagues, it is relatively easy for a technically competent person to 'bat' away complex and ambiguous considerations which aren't publicly entertained. Technically competent people

aren't always comfortable talking about principles of protection which are inevitably grey scale, rather than black and white.

Legacy media play a supporting role in supporting private industry priorities by failing to tackle complex and nuanced issues in the public interest, particularly when it is clearly evident that if an activity were to be prevented or cease, the industry would lose income. Newsrooms are used to incorrect claims being sharply contested by industry representatives, and veer away from situations that could end in court.

Advertising income encourages a docile media and editors are alert to threats of court action from sharp-eyed industry lawyers. Inevitably, overlapping institutional ownership arrangements produce irreconcilable conflicts of interest. Despite the mountains of content released by streaming services such as Netflix, there is no place for tales of harm from technology and pollutant emissions. Environmental programmes focus on climate change. Even well-worn classics such as *Silkwood* and *Erin Brockovich* can be hard to find. Media downplaying the environmental drivers of disease is not a new phenomenon [100].

Media are also unlikely to put in place off-message content which might weaken relationships with governments and their communications staff. Memorandums of understanding from public funding rounds, as we have seen during the COVID-19 event can also play a role.

In New Zealand the Science Media Centre and the Department of Premier and Cabinet funded Disinformation Project do not draw attention to the failure of authorities to consider complex issues, and the absence of reviews of the scientific literature to increase departmental knowledge of the risk profile of a given technology. These organisations similarly fail to take into consideration the financial conflicts of interest that occur when industry actors use their own data to claim safety of a product and support greater resources to more widely review the scientific literature, particularly in moments of controversy or when the science relating to a technology is swiftly changing. As such, they are part of the problem.

**By Design.**

As private industry has expanded and globalised, so has corporate strategy. Extending from nudging public opinion, to nurturing relationships with officials to ensure that policy and regulation are favourable. Marketing occurs in media-level, where experts are available to challenge controversial news items, extending to positive stories and imagery in television series and films, nudging society to perceive the technologies as safe and desirable. Marketing shifts to science information and expertise at policy and regulation level.

Without independent counter-balance to industry power, private industry capture of how technologies and their emissions are regarded, extends from the dinner-table to the policy table:

> 'Over the last decade, private interests have significantly perfected and upgraded science-based forms of societal pressure and control... offers clear examples of colonization of the world of science by corporate lobby. However, this penetration did not follow the traditional regulatory capture. Instead, it could be depicted as a complex and nonlinear strategy, spanning epistemic, institutional, and political dimensions, where science plays a predominant role. New agency relationships, knowledge and power asymmetry are elements of this new landscape. Such an asymmetry in the use of knowledge needs rebalancing.' [55, p. 12]

Yet for democracy to survive, our institutions must have capacity to identify complex issues which have potential to lead to the abuse of power, and/or harm to society. It is only when we consider a lot of facts together, as Jasanoff reminds us, that we get to some approximation of truth. And along with this messy approximation, comes a capacity to judge.

The asymmetry of knowledge which makes debate with friends so difficult, is a reflection of political power.

> 'Whether power is conceived in classical terms, as the power of the hegemon to govern the subject, or in the terms most eloquently proposed by Michel Foucault, as a disciplining force dispersed throughout society and implemented by many kinds of institutions, science and technology are indispensable to the expression and exercise of power. Science and technology operate, in short, as political agents.' [101]

When the bulk of publicly available information nudges society to a particular position on risk, society are less likely to engage in such debate, and their perspectives can become rigid and polarised. Our behaviour alters, undermined through practice, discourse and media rhetoric. Nudge units and misinformation and disinformation units are not tasked with critiquing the contradictions or conflicts of interest that might underpin a policy position. They are in place to deploy government policy. An example of this behavioural nudging in obesity policy, rather than focussing on the technological design, formulation ingredients and marketing of hyper-addictive, harmful ultra-processed food [102, 103].

Science is framed as apolitical, but the subject, the scope & often the outcome reflects the principles of the funders. 'Follow the science', claim the officials, while ignoring these contradictions.

The microprocesses involving government regulators, universities, science advisors and legacy media exert a weblike expression of power. Michel Foucault understood these processes, ensemble, as forms of governmentality. Presented as impartial, but ultimately controlling, or governing:-

> 'techniques and procedures for directing human behavior. Government of children, government of souls and consciences, government of a household, of a state, or of oneself. [104]

## 6. THE PATTERN REPEATS NO MATTER THE TECHNOLOGY

These practices are consistent across a surprising array of technologies. Market access ordinarily involves close industry stakeholder-government relationships. The innovation (and potential emissions or effects) may concern a chemical or formulation, a novel biotechnology, digital governance infrastructure with AI, or wireless radiation.

New Zealand provides ample examples of global patterns and processes. Regulatory institutions may –

- Never conduct risk assessment, ignore international court findings, and use private industry data as proof of safety (glyphosate) [105, 106, 107, 108];
- Have disbanded bioethics oversight (biotechnology) [109],
- Ignore epidemiological evidence (pesticides) [110];
- Lock in aged standards [111] while risk changes (wireless radiation) [112, 113, 114].

While key government actors may:

- Use legal loopholes to override local ordinances (urban pesticides spraying, wireless radiation, fluoride) [3, 111, 115];
- Focus on privacy but not human rights (digital infrastructure) [116, 21];
- Meet with powerful brokers outside of public fora to support politically sensitive policy shifts (central bank digital currencies) [117, 118].

- Coerce population-level exposure to technologies with incomplete data (genetic mRNA vaccine) [119] [120] and fail to address contradictory evidence [121, 122, 123, 124].
- Exclude key experts (endocrinological) to identify developmental toxicity risks: to humans as well as vertebrates in receiving environments (fluoride) [115, 125].

The level at which a biological entity may be harmed by a technology, is vastly different, by organism, by concomitant stressors, by life stage. Risk assessment requires navigating scientific environments and accounting for and judging risk amidst the inevitable complexity, uncertainty and ambiguity [1].

Such discussions – which includes human rights infringements - are out of scope for the above technologies.

The manufacture of doubt and uncertainty to prevent regulation forms a well-documented playbook [34]. Industry patrols regulations, ensuring that regulations bend towards market access. Product defence firms and industry associations strategically use their expertise to produce doubt, to prevent the raising of regulatory eyebrows and stricter legislation which would ban or restrict market access.

Industry actors

Governments can actively refuse to produce knowledge and impede the production and dissemination of alternate knowledge that might contradict or undermine their activities. In the 'largest urban aerial spraying operation in world history' [3], government agencies

> '… neutralized existing knowledge through suppression, omission, dismissal, denial, downplaying and diversion. As well, they hampered potential sources of uncomfortable knowledge, whose information could have undermined support for the government's agenda.' [3, p. 194]

Persuasive communication involving deceptive techniques to claim safety fits a rubric of propagandistic non-consensual practices. Such techniques decouple the capacity for an affected person to consent.

> 'Deception through omission involves withholding information to make the promoted viewpoint more persuasive. It is deceptive because those involved know people would be less likely to be persuaded if they knew the full picture.' [29, p. 12]

> **… what's clear is that the industry's legacy isn't its product, but rather its defense.**
>
> **D.Michaels (2020)**

Rather than deliberately electing to be exposed to the above technologies, they are imposed (or proposed to be imposed) upon populations.

## 7. NON-CONSENSUAL ORGANISED PERSUASIVE COMMUNICATION

Scientific and technical information which is not required to conform to processes of accountability and transparency can be characterized as a form of non-consensual organised persuasive communication. Bakir et al (2018) have theorised a framework where they propose that non-consensual persuasion, occurs through methods involving deception, incentivization and coercion. Within this framework, deceptive information management is defined as 'persuasion via lying, distortion, omission or misdirection.' [29, p. 12]

The public are not privy to the secret meetings that develop the locked in methodologies and guidelines, across the range of technologies discussed here. Nor can they contest the secret private industry data. Once the products are released, society are power-less, and must consent to these technologies and the concomitant assurances of safety.

> ‘At some point in a chain of reasoning a hidden, misleading, or otherwise unexamined presupposition will affect the outcome in a way not assessed by the propagandee.’ [124]

Without transparency, which includes robust review of published research, and public scrutiny of industry data, these assurances amount to half-truths and deliberate omissions. Bakir et al note that deception is achievable without resorting to lying. Secrecy, misdirection and silence are also manipulative and deceptive practices.

**Secrecy, misdirection and silence.**

When scientific and technical considerations are persistently and strategically excluded, yet the public are not aware of this, assertions of safety arguably mislead or deceive the public. Accountability is claimed but not practiced.

When risks fail to be considered, society cannot be said to be fully informed. The technologies are unable to be avoided and are imposed upon populations, from conception.

> **‘When someone is persuaded under false pretences, incentivized via promise or providing of benefits, or coerced through threats or actual infliction of costs (including withdrawal of benefits), consent is not freely given.’**
>
> **Bakir et al (2018)**

In addition, silence and inaction by media and responsible authorities actively minimise the opportunities for those seeking to raise greater public attention regarding a controversial issue. There is no signal or trigger that might alert broader lay and expert interests to secure broader political traction. Instead, the issue, is downplayed. Manipulative and deceptive practices extend to secrecy, misdirection and silence.

In the case of glyphosate, high-level New Zealand public health experts called for a withdrawal of a review paper and a risk assessment of glyphosate [106]. Four years later, they continue to be ignored by New Zealand’s Environmental Protection Authority (NZEPA) who are yet to undertake a risk assessment of the most commonly used herbicide. In 2020 the NZEPA released a methodology document, which clarifies that the authority relies on private industry data, focuses on hypothetical modelling scenarios and fails to require epidemiological evidence [47]. In addition, the NZEPA, instead of a risk assessment, have directed their energies to occupy their staff with a Call for Information on glyphosate. It is evident from the summary document that this document was never intended as a resource for scientific information. Instead, much of the document seems to reflect industry positions such as the misleading ‘glyphosate prevents herbicide resistance’ claim which was a quote drawn from many horticultural submitters to the Call [125, 126].

Society might rightfully ask why New Zealand’s hazardous substance regulator appears to be delaying risk assessment for substances where the scientific literature demonstrates a substantial risk profile. Questions might also be asked as to why the authority has misdirected staff energies to time-consuming Calls for Information instead of risk assessment for substances where there is extensive evidence that currently promoted safe methods of using these chemicals might not be as safe as regulatory agencies claim.

This inaction, silence and distraction in the face of expert and public appropriation occurs across many technologies. Governing mentalities [127] lock in rigid guidelines and modelling scenarios, and ignore exciting technologies such as new omics technologies, and endocrine disruptor screening that could support research on open-ended complex, ambiguous and uncertain science [1].

Somehow officials and policy are extremely enthusiastic about the latest evidence-based science, except when it concerns the stewardship of technology and non-greenhouse gas emissions.

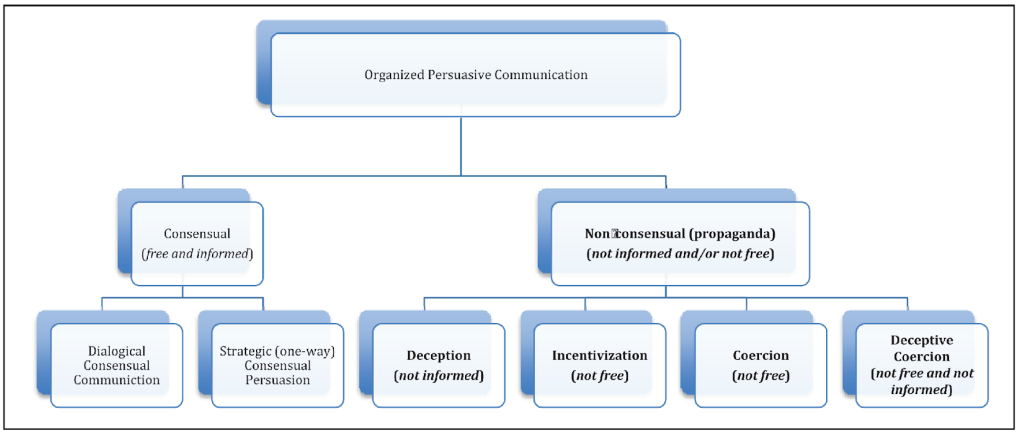


**Figure 1.** Organized persuasive communication.

Figure 1 Bakir, V.,et al.(2018). Organized Persuasive Communication: A new conceptual framework for research on public relations, propaganda and promotional culture. Critical Sociology. 45;3:1-18.

Incentivisation can have a coercive dimension. In New Zealand, it is easier to enrol in tertiary institutions with a RealMe digital identity. The claimed convenience incentivises students to submit to the gathering of biometric data. Biometric data is used widely in China for population control through social credit policy practices.

Coercion can arise when the barriers to preventing or contesting non-consensual emissions are beyond the scope of residents, due to layers of bureaucracy.

- Communities confronted by pesticide spray-drift onto their land, or forestry herbicides in their drinking water are coerced into acquiescing because layers of bureaucracy require a direct link to acute harm, if they are to succeed stopping contamination of their land.

However, deception may also play a role, with the public unaware of policy processes or problems:

- In Tauranga New Zealand, 5G radiofrequency repeaters have been installed on streetlights, every few hundred meters. The public are unable to contest this locally as jurisdiction has been transferred to central government. The local council contains no information on the issue as the central government regulates the activity [128]. This radiofrequency technology is now being extended to 55 rural and regional towns across New Zealand [129]. Every central government directive claims safety.
- The production of central bank digital currency (CBDC) transfers enormous powers outside of Parliamentary processes, where the allocation of budget and expenditure occurs, to Reserve Banks. Society is largely unaware that CBDC policy is largely driven behind the scenes, through interactions between local reserve banks and the International Monetary Fund [130].
- Bioaccumulation of specific classes of chemicals such as herbicides in the environment, which have the same mode of action, are not recognised or regulated. Therefore, the public do not understand that toxicity levels may be harmful.

## 8. CONCLUSION: CORPORATE SCIENCE AS CATEGORY OF PROPAGANDA

When scientists and society protest and contradict institutional claims, they are declared conspiracy theorists, the conspiracy is not with us.

The conspiracy is in the rules, the guidelines and laws which are produced behind closed doors. The conspiracy is when publics, expert and lay contribute to public consultations, but their discussions and evidence remain unaddressed and met with silence. The conspiracy is in public-private stakeholder meetings with dominant institutional providers; in global meetings [131] where public access is forbidden or impossible; and in the entrenchment and upholding of commercial in-confidence agreements that privilege the corporate sector over societal interests. The conspiracy is in elite formations of publicly-paid officials and scientists that blind their eyes to years of evidence which demonstrate that industry-produced data finds in favour of industry. The conspiracy is when judges defer to Crown lawyers whose primary interest is in deploying the technology in question; and when select committees also defer to government departments whose key aim has been to deploy the technology in question.

When science and technical information is used in this way, it is not science and it is not impartial. It is a tool. An instrument. This market-science forms the backdrop of a form of organised, persuasive communication, referred to as propaganda. Secrecy, misdirection and silence.

Saltelli et al (2023) regard this broad colonisation of information as a form of strategic institutional, cultural capture of people and their governments' role as their protector. Where the chain of private industry influence extends beyond officials and institutions who review the evidence, to industry domination over the language we use in our public lives through the mediums outlined above. This might explain how difficult it is to contradict mainstream rhetoric without being labelled or smeared as a conspiracy theorist, a nutter, or an 'anti' extremist [55].

Wherever the public searches, in order to source information across the machinery of government, the information will assert and uphold the safety of these technologies, no matter the contradictions in the peer reviewed literature. The institutions that benefit, and their relationships are ordinarily kept out of sight. The harms which accrue following the release or deployment of these technologies are often difficult to trace, are multifactorial and occur slowly over time [42]. Citizens as individuals, are left unable to contest these technologies and must acquiesce and accept them.

Specifically, what we have across the machinery of government, are sites of the production of propaganda, with power asymmetrically weighted to benefitting dominant institutions.

> '[T]he active promotion of particular world views can be seen as, in the first instance, the establisher of particular ideological constructs'. [132]

After 30 years of political pressure, New Zealand's scientific and research institutions have been co-opted and their priorities redirected. Funding scopes and hyper-competitive environments now direct scientists and researchers to prioritise 'innovation' and applied science, while undermining broader enquiry. Without capacity to select complex and worthy research based on merit, they now sit inside the broader propaganda apparatus [132].

The public have been misled and deceived through these political processes which have changed the structure and function of our science and research institutions. The small spaces where work might be currently done are so miniscule and impoverished as to exert no counterbalance to claims of industry or the policy-makers who favour a given technology or scientific position. There can be no assertion that

there is a balance between research dedicated to innovation - and basic science in research institutions dedicated to understanding the consequences of innovations and their effects.

Having no pathways to appeal to government claims that technologies are safe, we must submit to them. We can't contest the devaluation of water and soil from crescive emissions, nor can we require industry to pay the costs [133]. Ultimately, the scientific 'facts' produced by microprocesses assemble as a powerful, controlling force.

In 1928, Edward Bernays presciently drew attention to the pressure in academia to produce information which supports powerful interests [134].

> **… it may well be, in many instances, that the demands which the potential endowers of our universities make upon these institutions are flatly in contradiction to the interests of scholarship and general culture.**
>
> **E.Bernays (1928)**

**E.Bernays (1928)**

So, then, when is the line crossed? Propagandistic practices such as secrecy, misdirection and silence effectively corrupt constitutions of countries and therefore their public law principles. These practices effectively allow government officials to abandon legal norms of transparency and accountability. The patterns of deception through crafted selection and omissions without lying remain a legal grey area.

It is not science that guides us, but an ideology – a cultural capture - which has corrupted science systems. Science-like claims inevitably serve the purposes of the private owners of the patented technologies.

Productivity in Western countries is declining. The current generation of children has higher levels of chronic and mental illness than their ancestors and consume greater quantities of pharmaceuticals. Monitoring and research for emissions other than greenhouse gases is negligible or non-existent [26].

Licensed digital technologies with alarming surveillance potential are permitted through governance policies inside the back-end of administrative frameworks. Society is encouraged to use the RealMe system for identification, such as when signing up to tertiary institutions, and biometric data must be provided. Yet the arrangements and agreements with the private industry providers are undisclosed to the public. There are no independent scrutineers, and this is beyond the Privacy Commissioner's scope.

Neither current regulatory and legal frameworks, nor public funding frameworks provide society with pathways to contest the status quo across these technologies, in such a way that reflects the complexity of exposure to emissions and their residues.

Yet it is of the essence that we understand that complex, ambiguous and uncertain risk problems are an inherent component of modern governance. Simply expanding stakeholder involvement is not sufficient if the foundations supporting the informational environment are not robust.

Limited, representative government is essential to protect the safety of the population, and prevent abuse of power, from the state and from private actors. Yet it appears that market-science has captured the machinery. Market-science is the ghost in the machine which prevents society from contesting abuse of power.

New Zealand's science and research community, - or information (and intelligence) system is not robust enough to counter, contradict or challenge political and financial power. The scientific research and science system is lodged inside the Ministry for Business, Innovation and Employment. The government department most tasked with economic growth has historically heavily restricted resourcing for basic

-science research that collectively produce interdisciplinary science and research. Broad basic-science research might contradict the technologies that are portrayed as enhancing productivity and gross domestic product. Funding has also been difficult to secure for basic-science research that can inform the government, and highlight alternative practices that reduce the use of chemical technologies, such as in health and agriculture. Funding policies are designed so that such research is commonly outside the scope of consideration by funding committees.

The world is awash with a market-science tyranny that protects and enlarges wealthy pockets at the expense of people and the environment needed to sustain their future generations.

Without tasking public-sector scientists and researchers to monitor these technologies and their emissions, to broadly review the literature, to develop innovative methods to understand both how they are risky, but to also reduce the risk, or even substitute the technology for a less harmful technology, society and government cannot protect and promote health of people and their environment.

New Zealand's government is requiring that all decision-making follows processes of Mātauranga Māori. This should not be a proxy for claiming that the government is honouring the Treaty of Waitangi, if the funding scopes prevent scientists and researchers from understanding complex environmental factors driving chronic disease at younger and younger ages; promoting plant and livestock disease and increasing pollution levels in water, soil and air. Unless New Zealand institutions, and their researchers and scientists are tasked and funded to actively inquire and review the literature on risk for technologies and their emissions, the New Zealand government will continue to fail to protect human and environmental health and fail to honour the Treaty of Waitangi.

Current government processes relying on selective science are neither consensual nor democratic. Representative democracy predicated upon an elite, stakeholder demos, with society-at-large written out, and science unfunded, is not representative of the people. It is representative of the private industry cartels, the investment management companies and their shareholders.

Innovation may be central to our largest challenges, but it is the *stewardship* of innovation that is the key issue. Resilient, healthy democracies require governance systems with the capabilities and intelligence to produce, analyse and communicate challenging, contradictory and politically inconvenient information.

But with corporate 'market' science meshed through policy, when do technocratic, authoritarian administrative cultures formally transition to totalitarian regimes?

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