Introduction

Post-truth – another fork in modernity's path

Kjetil Rommetveit

> "When I use a word", Humpty Dumpty said, in rather a scornful tone, "it means just what I choose it to mean — neither more nor less". "The question is," said Alice, "whether you can make words mean so many different things". "The question is," said Humpty Dumpty, "which is to be master – that's all."
>
> (Lewis Carroll, *Through the Looking Glass*, 1871)

Since the concept of post-truth entered the public scene in 2016, it has proliferated and spread throughout a number of discussion and publication sites. Although the concept had been around for some time, it had mainly circulated in academic and journalistic circles. Quite suddenly it was propelled to fame by main media outlets in their commentary on the UK's Brexit referendum and the US election of Donald Trump. The implication was that the collective capacity for truthfulness and respect for fact had deteriorated, and mechanisms for checks and balances had failed, been corrupted and bypassed. Public institutions and functions had been left open to demagogues, populists and peddlers of fake news and false factual evidence. Since then, post-truth has rapidly spread beyond the western and Anglo-Saxon contexts in which it arose, and is used in Spanish (posverdad), mandarin (*houzhenxiang*, 后真相), German (post-faktisch) and in the English-writing parts of Indian media. Post-truth is a concept deeply invested in media discourse, in media technologies and unfolding information ecologies of the early 21st century. It has become a catchall phrase used to describe whole societies and ways of life, and referenced by Wikipedia as a distinct style of doing politics. It is frequently associated with populism, authoritarianism and even fascism. Yet, the subject around which such associations turn, is *science in public* and *the political role of science and technology*.

Post-truth was defined by the Oxford Dictionary (in 2016) as originating in "circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion or personal belief". This definition can be used to indicate historical and political *shifts* (the "era of post-truth"), but the concept also has strong rhetorical and performative uses:

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post-truth can be used to denigrate an interlocutor's capacity for (or even interest in) veracity and truthfulness, and to pre-empt any claim or argument, by stating that the other's argument is mere opinion, bias, expression of false consciousness, or self-interest. It simultaneously becomes a way for strengthening one's own position: staging it as beyond the fray of populist opinion, and as based in scientific Enlightenment and Reason. *Or*, just as likely, it can be used to turn the table on official truth-telling: situating one's own position as "straight talk", siding with "the people", and opposing expert discourse seen to no longer represent collective opinion and interest. Post-truth rhetoric can be used to align one's message with an in-group (*the People*, cf. Müller 2017), thereby creating an outgroup (*enemies* of *the People*), possibly a foreign enemy aiming to undermine the sovereignty of the in-group (the Nation, the People). It can be used to attack and defend traditional ways of truth-telling, such as scientific and legal evidence, and to mobilise alternative sources such as anti-vaccination movements. As is already clear, post-truth attributions are ultimately deeply normative and they are usually aimed at delegitimising an established form of authority.

Within this performative register, we observe the recurrence, in new forms, of old problems of philosophers and sociologists of knowledge (from Pareto onwards), known as the hermeneutics of suspicion (Ricoeur 1970) and critique of ideology (Mannheim 1936/1972). To demonstrate, in the foreword to the 1936 edition of Mannheim's *Ideology & Utopia*, Luis Wirth wrote:

> It seems to be characteristic of our period that norms and truths which were once believed to be absolute, universal and eternal, or which were accepted with blissful unawareness of their implications, are being questioned. … We are witnessing not only a general distrust of the validity of ideas but of the motives of those who assert them.

Propelled by rapid and intense circulation through digital networks and social media, in these days such critical repositories have gone viral: *who* has a privileged right to knowledge and reality, once it is recognised that any knowledge or piece of evidence is partial, perspectival, and always to some extent shaped and limited by human interest and perspective?

Scholarly responses have arguably adopted one of two strategies: (1) they have involved themselves in epistemic pearl-clutching, rushing to the defence of fact, truth, and rationality, and condemning constructivist, post-modern, attacks on these (see for instance, Shore 2017, McIntyre 2018, Wikforss 2018). Alternatively (2), members of scholarly communities studying science and society interrelations, have ended up in rather defensive positions,[1] feeling the need to defend their stances on the social (and political) roles and uses of knowledge, and of critique of knowledge (see section on Science, Technology and Society (STS) post-truth debate, and Durant, this volume).

For the collective contributing to this book, main motivation came from a feeling that there is more to the phenomenon, considered as a moment in the evolution of knowledge society. Historians, sociologists, and philosophers of science have long-since demonstrated how truth and fact-making depend not merely on correspondence between factual representations and the world, but crucially also on practices, institutions, public displays, and rituals. Stating this does not amount to relativism in a strong sense, but points to the broader meanings and imaginations that provide fact and evidence with meaning, context, and direction (cf. Polanyi 1958). We, the authors, have assumed that post-truth is not merely an outcome of vicious attacks on Reason and Enlightenment, but rather denotes gradual shifts of fairly well-known developments. Specifically, we argue that post-truth emerges as *intensifications* (see Pellizzoni, this volume) of processes, practices, and institutions of modernity, thus shifting their meanings and qualities, possibly reaching discontinuities like tipping points. Modernity's defining cardinal truths *never were* without (self-)contradiction or ambiguity. And, in the midst of the innovation economy, some very old and partially forgotten figures of thought are re-emerging, whereas others fall into the background.

One example is the capacity for critique itself: According to Habermas (1987), critique and suspicion (or scepticism) are legitimate and necessary mechanisms of modern western institutions and societies, as long as they are countered by rational communication embedded in institutions (Skirbekk 2019). From a hermeneutic point of view (Wynne, this volume), such institutions are underpinned and sustained through at least a working minimum of relations of trust, mutual understanding, and shared collective meaning. Ricoeur described the hermeneutics of suspicion as "reduction of the illusions and lies of consciousness…", where "'truth as lying' would be the negative heading under which one might place these (…) exercises of suspicion" (Ricoeur 1970, 32). Post-truth intensifies the hermeneutics of suspicion, and has been described as the proliferation of "bullshit" (Frankfurt 2005, cf. Durant, this volume) where truth no longer matters, even as a remote ideal, and the only goal is persuasion and obfuscation. Yet, as pointed to in all chapters and in this introduction: even if bullshit proliferates, persuasion and obfuscation are intelligible as practices in their own right, and can be turned into the foreground of analysis. Hence we may point to a more constructive role for critique, also implied by Ricoeur, namely for reconstruction of historically emergent asymmetries, and articulation of conditions that could enable communication, mutual understanding, and a common world (cf. Habermas 1982, all contributions to this volume). This comes closer to critique as an emancipatory project seeking to re-establish practices and institutions supportive of collective meaning and action, and limitations (checks and balances) on power. Here, we may also point to a Foucauldian concept of *problematisations* of the present, and Dewey's *problem of the public* as grounded in, and trying to articulate, a collective situation and collective predicament.

Post-truth therefore indicates shifts or intensifications in major public imaginations of science and politics, driving established categories, meanings and practices beyond their established boundaries, creating *new starting points* and a need for re-articulations on the side of analysts. What those intensifications and starting points are, is developed in each contribution to this volume, as described at the end of this Introduction. In preparing this volume, some main themes and their interrelations have been circulated amongst the contributors, based on the works of Wynne (1982/2011) and Pellizzoni (2011, 2015), and a merger of these lines of inquiry in a prior special issue (Pellizzoni 2017, Rommetveit and Wynne 2017). These identified themes, which may work in conjunction or as contradictory forces, are:

Firstly, a *weakening or thinning of public and collective meanings* (cf. Wynne, this volume), situated on the intersections of science, technology, and society and that would give meaning and context also to facts and to science. This is exemplified by recent works on imagination in science, technology, and politics, associated with notions of performativity and imaginaries of public meanings (Felt et al. 2007, Ezrahi 2012, Welsh and Wynne 2013, Jasanoff and Kim 2015).

Secondly, a *blurring of boundaries*, such as those between fact and value, science and politics, Nature and Culture, as intrinsic to most analyses of post-truth, and to economies of knowing and non-knowing. This theme has been elaborated in studies of ignorance as inadvertently (Beck 1992, Wynne 1992, Beck and Wehling 2012, Guimares Pereira and Funtowicz 2015), and as deliberately created (Oreskes and Conway 2010, Gross and McGoey 2015, cf. Nordmann 2020). It is found in studies of neoliberalism and technoscience (Sunder-Rajan 2006, Cooper 2008, Pellizzoni and Ylönen 2011), and in works on the social and cultural implications of cybernetics and digital technologies (Bowker 1993, Hayles 1999, Mirowski 2002, Turner 2006, Kline 2015, Bigo et al. 2019).

Thirdly, and closely related, *shifts in the politics of time*, as the negative value of time (the economic demand for speed, for example, in supply chains) is intensified, specifically, the strong futures-orientation of contemporary technoscience, the role of promise and expectation (Fortun 2008), and their intricate interrelations with a neoliberal economy (Cooper 2008, Pellizzoni and Ylönen 2011, Lave, Mirowski and Randalls 2010, Pellizzoni 2015).

In what follows here, I present one possible interpretation of these themes, focused on intensifying logics and imaginations of risk and technoscience, which is then applied to a genealogy of post-truth. Following this, I provide an account of discussions in philosophy of technoscience and STS, mainly centred on a debate in the journal *Social Studies of Science*. In the last section of this Introduction, I suggest that post-truth be conceived as performative, where the performance of truth extends on and encapsulates all of these (intensifying) dynamics or trends.

From risk to technoscience: whither the "knowledge society"?

Central to the post-truth diagnosis, including academic accounts of it (see section on the STS post-truth debate), is the blurring of categories separating facts from values, opinion and imagination, affect from reason, and science from politics. As argued throughout, such blurring must be understood as intensifications of what could be called quite ordinary and officially sanctioned mechanisms of industrialised knowledge societies. In this section I pursue these dynamics into two ways of projecting natural order and human control: risk and technoscience.

According to Ulrich Beck (1992), the public role ascribed to *risk* denoted increasing (implicit and explicit) recognition in industrialised societies that reliance on science and technology came with negative though unintended consequences, such as nuclear accidents and proliferations of chemicals throughout ecosystems. Efforts to deal with such consequences ran counter to prevailing institutional arrangements, based on separations of Nature from Culture, science from politics, since (ecological) disaster, indeed normal ecology, respects no such boundaries. The dynamics of risk played out beyond the reach of institutional mechanisms (i.e. parliaments), and threatened developments that would run out of control. This led to the inclusion of Early Warnings mechanisms, i.e. risk assessment and risk management (Harremoes et al. 2001) to deal with the risks *before* they could settle in society and in the ecosystems. As opposed to manifest disaster, risk operates on *as-if* assumptions, promoting logics of anticipation and precaution, and assuming future dangers as present calculable reality (Beck 2009). As a technology of (control with) public imaginations (cf. Wynne 1975, Ewald 1991), it fuses within a horizon of calculability, the absent and the present, the remote and the nearby, the real and the possible.

Scholars of STS pointed out the limits of the risk calculus, and how it could only be understood on a continuum invariably also including *uncertainty, complexity, ignorance* and *unknown unknowns* (Wynne 1992, Funtowicz and Ravetz 1993). They argued the need to attend to the irreducible social and natural worlds, the human relations and imaginations, in which material risks were embedded (Wynne, this volume). This seemed to require broader participation and inclusion in decision-making, and inclusions of precaution in the broadest possible terms (Jasanoff 2003). A further quintessentially constructivist STS point was made by Wynne (1992), which when one includes those further dimensions of risk analysis into the attempted risk-quantification, the question of trust is seen to be an *essential* component of questions of risk. Despite these authentic challenges, due to long-established ways of knowing and governing in for example insurance market mechanisms (Ewald 1991), risk as an organisational and managerial tool kept expanding and inserting itself across institutional and life-world boundaries. Big data and IT systems of all kinds

have been regulated in data protection and privacy terms, by importing risk assessment protocols and methods taken directly from material risk domains such as chemical pesticides, agrobiotechnologies, nuclear power, and GM crops. This expansion carried risks of its own, as risk would eventually engulf basic societal and institutional distinctions: "Risk functions like an acid bath in which venerable classical distinctions are dissolved… the 'binary coding' – permitted or forbidden, legal or illegal, right or wrong, us and them – does not exist" (Beck 2009, 187). The category of risk itself started to blur and, in spite of its pretensions towards precision and control, gradually merged with events that *cannot be controlled* (Pellizzoni, this volume). In his later works, Beck recognised how risk dynamics were re-politicised in spite of their technocratic framings, initially through state and private actors becoming more active in the security fields, with implications also for *risks to political* and *human freedom* (Beck 2013, cf. Rommetveit and van Dijk, this volume).

According to Baumann (2012, 51), the promise of control through risk needed to assume "a universe in which the probabilities of events are predetermined, could be scrutinised, made known, and assessed". The gradual realisation that such an environment cannot be assumed (cf. Lakoff 2017), combined with the increasing organisational complexities and costs of containing risk (Wynne 1992), has brought shifting imaginations, strategic priorities, and forms of legitimation. The impacts of today's most prominent global dangers, from climate change and species extinction, to nuclear annihilation, pandemics and terrorist attacks, cannot be meaningfully calculated, predicted, or contained. The dangers are "unnamed before striking, unpredictable, and incalculable" (Baumann (2012, 51), constitute both "known" and "unknown unknowns", that are largely non-intended and inadvertently produced.

Risk can be recast as enabling opportunity for entrepreneurial undertakings, rather than only limitations on action (precaution). Since its original launch in 2013, this view has been vigorously promoted in the EU-focused "Innovation Principle", which is intended as a counter to what is seen as the anti-innovation qualities of one of the EU's central policy and even constitutional pillars, the 2000 Precautionary Principle. Political strategising, agenda-building, and innovation take place against backdrops of increasingly disorderly ecological and political systems, and come inscribed with imaginations of disruptive innovation and creative destruction (Rommetveit and Wynne 2017). This does not entail an abandonment of risk, but a slide in meaning-making towards positive embrace of stochastic forces, indeterminacy, and complexity (Pellizzoni 2011). The underlying imaginations are more easily aligned with subjective (Bayesian) conceptions of risk, merging with promise and private wishfulness. Other modes of legitimation have also come to the fore: from *neutral representation to intervention* (cf. Hacking 1983), from *archetype to prototype* (Nordmann 2017), from *precaution* to *pro-action* (Fuller and Lipinska 2014) and *pre-emption* (Pellizzoni, this

volume). With increasing digitalisation, projections of universality also shift, from a view from nowhere (Nagel 1986) towards a strongly utopian and totalising *view from everywhere* (Bowker 1993, Turner 2006, Morozov 2013, Zuboff 2019, cf. Ballo and Vaage, this volume).

Insofar as the key claim in question is about knowing through big data, sensors in the environment, digital networks, and algorithms, such knowing has to combine seemingly incompatible perspectives and requirements: on the one hand, the strong universalistic pretentions of data and information, applicable anywhere, any time and to any process, from the nano-level to IBMs "smart planet". On the other hand, data science and machine learning seemingly dissolve any objective relation into a probabilistic universe that is also "intentionally artificial and limited" (Mackenzie 2017, 116). As noted before, and partly because of the background exaggerated presumptions of the epistemic power of such knowledge forms, this explicit intellectual delimitation also embodies and engenders inevitably normative political and social exclusions that remain implicit – until identified, and challenged. Such contradiction however is oftentimes not resolved, but pushed indefinitely into the future, and into forms of networked knowing and interacting to achieve those imagined futures. Hence, similar to risk, the future emerges as an object to be produced and controlled, this time through technological means. Technoscientific ways of knowing supervene on previous ways of knowing, also dissolving prior categories of calculation and ordering, into "emerging patterns" of big data and machine learning. These entities that are both "raw and curated, both real and highly artificial" (Cohen 2019, 66), and performatively involved in the (co-)shaping of politics (Bigo et al. 2019). The frame of reference shifts: whereas epistemology and risk is about that which in principle can be known, ontology and ontological politics pursue reality and experience itself: "The thing itself, and the real, is never encountered – it is a virtual, a generative force; it is metaphysical rather than physical" (Lash 2007, 71). Immanuel Kant termed these the *Noumenal* aspects of reality, denoting the *limits* beyond which rational pursuit of knowledge should not proceed. Yet this is what happens in major public agendas such as smart modernisation (Vaage and Ballo, this volume), Internet of Things and Fourth Industrial Revolution (Rommetveit and van Dijk, this volume), where the most powerful technologies in existence today are directed exclusively futurewards. Large-scale engineering merges the abstract and infinitely big, with the intimate and everyday (i.e. sensors on the body, smart phones, and gadgets), and overflowing promises (Durant, this volume) to remake reality across biological, physical, digital, and social boundaries. Such promise projects an underlying, non-dualist view on matter and data as vibrant (cf. Latour 2005, Bennett 2010), vitalist and productive sources of surplus value to be extracted (Pellizzoni 2015, Cohen 2019). As such, participation in value-creation may even appear as an attractive surrogate for actual democratic participation in processes of (digital) innovation.

Technoscience in its public functions is deeply invested in the imagined-possible, and comes to resemble charismatic *political* authority as described by Weber:

> Charismatic authority, represented by the prophet is the purest form of authority in that it claims the right to break through all normative structures … The prophet, so long as he retains his charisma, can destroy old norms and create new ones.
>
> (Spencer 1970, 125)

The high priests of post-truth are the high-tech and hedge-fund billionaires in control of financial and technological capital and vital infrastructure (cf. Rommetveit and van Dijk, this volume). The penultimate expression of this boundary-breaking, visionary form of authority can be seen in widespread pursuits amongst these elites: private wealth generation as a buffer against the vagaries of competitive, winner takes all social-Darwinist environments, dabbling in private enterprise space-travel ventures, and the active pursuit of immortality and life-prolongation to push death and suffering indefinitely into the future (Davies 2018).

This is not to state that science has now become politics, or that the authority of technoscience will expand unabated; indeed, what we are also starting to see, are initial institutional steps of questioning this authority, possibly reinstating new boundaries (Durant, this volume, van Dijk, this volume). Still, it indicates a novel situation, and a further weakening of purification rituals that were earlier central in political legitimation processes (Rommetveit and Wynne 2017, cf. Latour 1993). Corresponding to this weakening, the traditional roles of public institutions in countering and rectifying the disruptive effects of technoscience have also weakened over time and on several fronts at once. It is into these open yet deep spaces of possibility that alt-epistemic actors, themselves in fierce competition with the powers that be, are also forced to take more visibly political stances. Together, they create and perform a much more politicised and agonistic space where science and technology occupy main symbolic and strategic roles, and where the surrounding ecologies and political economies are increasingly projected as disorderly, complex, and largely beyond control. As noted in this section, this implies a reversal of a classical modern belief, namely, the idea that knowledge and truth is generally expanding, and becoming implemented in collective ways of knowing, what Jasanoff has termed civic epistemologies. With a shift towards ontology (towards that which *is* and *can be*), and towards innovation and engineering (that which can be technologically *created*), the routine production of ignorance (Nordmann 2020), which was always intrinsic to modernity (Beck 1992), is not a matter to be covered up, but also an investment resource to be actively mobilised for political purposes. Hence, post-truth denotes a redistribution within economies of knowing and unknowing.

The different courses taken by our knowledge societies may indeed unfold from the ways in which states, corporations, and civil society negotiate these increasingly tight relations between politics and technoscience. These relations are increasingly politically defined, as in the attachment of the post-truth label to different right-populist governments, in countries as diverse as India, the Phillipines, Brazil, Turkey, Poland, the US, and the UK (Bello 2019), and in efforts to counter them. Rather than try to describe all of these, here I shall focus on the settings and situation(s) in which post-truth emerged, that is, the US and the UK.

Post-truth: a brief genealogy

The initial coinage of the term post-truth is, according to Wikipedia, credited to the American playwright Steve Tesich, and his 1992 article "A government of lies" (in the US journal *The Nation*). His reference was to the exhaustion of the American public following the Watergate scandal (and, before that, the Vietnam invasion; and, following it, the Iran-Contras scandal). With the coming of the First Gulf War, Tesich argued, the US public no longer wanted to know the truth about war: *In a very fundamental way, we, as a free people, have freely decided that we want to live in some post-truth world* (Tesich 1992). In 2004, following the Iraq invasion, another journalist at *The Nation* published the book *When Presidents Lie: A History of Official Deception and its Consequences* (Altermann 2005). Although historically oriented, the book's concluding chapter was on the "Post-Truth Presidency of George W. Bush". A specific theme was the strategic use of falsified evidence in building the case for the invasion of Iraq, the main response to the attacks on the US on September 11, 2001. The Iraq invasion was carried out in the face of contrary evidence, and in the face of strong public opposition throughout the western world and beyond. *That* the invasion was based on erroneous and falsified evidence is beyond doubt, as demonstrated by the UK Chilcot commission of inquiry. It is also well-known how this falsified evidence was aggressively pushed by main media outlets, such as *The New York Times*, *The Washington Post*, and *The Guardian*. Still, the post-Iraq period has seen a continuation of "regime change" interventions throughout the Middle East and beyond, carried out in the name of freedom, human rights, and democracy. The Iraq invasion may thus be identified as the moment in which US public distrust in institutions, described by Tesich, were propelled onto the global, or at least the wider western stage.

Political scientist Colin Crouch (2004) identified this moment, at the beginning of the 21st century, as one of "post democracy". It designated a state where democracy had triumphed, and expanded rapidly beyond previously existing boundaries. At the same time, representative democracy and electoral politics were increasingly becoming "empty shells", disconnected from their electorates and publics. Within main systems of representative

democracy, "The People" no longer identified with their governments, nor with the main political parties that had driven the expansion of the welfare state and (for some) social democracy in the post-WWII period. This lack of identification between governing elites and the demos, was recognised in official governance documents (House of Lords 2000, EC 2001), and described by political scientists. According to Peter Mair, the representatives (party politicians) of representative democracy were increasingly staring into the "void", that replaced a well-functioning party – political system (Mair 2013) of the post-WWII order.

It was within this political and democratic void that post-truth was awarded "word of the year" by the Oxford Dictionary, and projected by main media outlets such as *The Washington Post*,[2] *The New York Times*, and *The Guardian*, following the Trump election and the Brexit referendum. The target of the media campaign (which after all appeared as coordinated) was clear. It was directed at certain agents of change, including campaign managers and publics, that enabled the election of Trump, and the Brexit referendum outcome. The usage of post-truth was pejorative and asymmetric, describing how the promoters of domestic regime change gathered support from "deplorables" and ignorants with little respect for science and evidence, and the national and international institutions within which they unfolded. It entailed, seemingly, a stubborn refusal to bow to the prescriptions of mainstream media and political institutions seen as, and seeing themselves as, the gatekeepers of the existing order.

The epistemic pearl-clutching of mainstream media voices denoted the realisation, by those suddenly identified as the "liberal elites" (Frank 2016) that *they* themselves had come under scrutiny, and attack. They suddenly saw their social standing and authority (through academia, politics, intelligence services, and the media), as up-for-grabs and in peril. As stated by Wolfgang Münchau of the *Financial Times* (2018):

> You hear it all the time: we need to defend our liberal, multilateral economic order. If you want to get a roomful of people in places like Davos to keep nodding their heads to exhaustion, this is what you say.

The emergence/y of alt-epistemologies: US style

Donald Trump's campaign aimed directly at this cosmopolitan, liberal political order, which he described as corrupted. He promised to "drain the swamp" of DC politics, and to reinsert the interests of real (predominantly white) Americans, many of whom were located in "Rust Belt" states hit by industrial decline and deteriorating living standards. He blamed, probably correctly, elite politicians (from both parties) for the outsourcing of work through international (Asian) markets and trade deals. He promised to end foreign wars, and to "bring the troops home". He effectively mobilised the in-group of "Real Americans", against the outgroup of Democrat

internationalists, identified as representatives of Wall Street, and against foreigners and immigrants. The strong racist elements were clearly captured by the promise to build a wall along the Mexican border.

It was presumably this direct identification with "We the People" (Müller 2017) that granted Trump the victory. The strategy, crafted by Steve Bannon and his co-ideologues (Green 2017), is quite consistent, whether one looks at Trump's public speeches and rallies, which usually took the form of spectacle and entertainment, or at the mobilisation of psychometric profiling to target swing voters through social media. Cadwalladr (2018) claimed that: "the idea they bought into was to bring big data and social media to an established military methodology – 'information operations' – then turn it on the US electorate". A main funder and facilitator of this operation was Robert Mercer, a hedge-fund billionaire and computer scientist, who set himself up as a spider in the web of connecting finance, politics, and technology (see van Dijk, this volume). Trump took directly to Twitter for communicating with the public (including other heads of state), sidestepping official protocol. His tweets were frequently ill-humoured responses to criticism, and used as evidence of his labile mental state. But the strategy was consistent with Trump's distrust of mainstream media, according to him the real peddlers of "fake news". Online and offline, therefore, the Trump campaign targeted long-established discontents, and the swing states that could tip the balance of the election (even as most polls proclaimed this to be unlikely).

The Clinton campaign, on the other hand, was widely recognised to circulate among the urban cosmopolitan elites, never venturing far beyond their interests and priorities. Their aim was not the swing voters, but to mobilise those already convinced (Allen and Parnes 2017). The campaign never really articulated a strong and clear message (like that of Trump, or of Bernie Sanders), but relied on well-known talking points from within the Democratic Party and focus groups (Allen 2017). This was expressed also in the use of big data: although much less reliant on social media, the Clinton campaign relied heavily on a super-algorithm called Ada. Ada ran 400,000 simulations per day based on polling and voter data collected by the campaign (Wagner 2016). Significantly, "Like much of the political establishment Ada appeared to underestimate the power of rural voters in Rust Belt states" (ibid.), thus reproducing the priorities of the campaign leadership. Jonathan Allen (2017) cites a scene from the campaign. In it, Bill Clinton was urging the campaign manager (Robert Mook) to change the strategy: "Listen, you need to campaign more in the Rust Belt and appeal to the concerns of working class voters," and Mook responds, "The data run counter to your anecdotes" (Allen 2017).

In what ways does this resonate with the distinctions laid out in the previous section?

First, the Clinton campaign remained reliant on the capacity for centralised top-down control as enabled through a well-established party

apparatus, which was already well-connected to main sources of official data generation and harvesting. It had a low presence on Facebook and social media compared with the Trump campaign. The campaign assumed and relied upon a surrounding environment remaining (more or less) stable, with the crucial task being to mobilise the party apparatus, and the voters already convinced. Trump, on the other hand, set out for the improbable task (according to pollsters) of de-stabilising the system, releasing its locked-up powers by tapping into public discontents with "the swamp" and a game that is rigged. These were, after all, well-known, if one only ventured outside of official circles of meaning-making (Frank 2016). Trump mobilised the forces of nationalism and populism, and the digital mercenaries of Cambridge Analytica, operating in legal grey zones created by the digital. The strategy, therefore, was one of *politics through disorder* (cf. Pellizzoni 2011).

The emergence/y of alt-epistemologies: UK style

The penetration of this alt-epistemic stance, and its intensification, can be more clearly observed in the case of Brexit, and specifically the construction of Brexit as a hybrid political and scientific object.

The 2019-elected government of Boris Johnson has been described as a "war cabinet" (cf. Shipman 2016, Davies 2018, Eaglestone 2018) engaged in the campaign to realise Brexit, "do or die", "whatever the circumstances". The cabinet includes many alt-right conservatives, identified with a resurgent radicalism within the conservative party, laid out in the book *Britannia Unchained* (Kwarteng et al. 2012). Johnson and his political advisor Dominic Cummings controlled the cabinet, which they ran like an organised political campaign. This campaign transitioned from the Brexit campaign and vote, into government, got involved in a conflictive and populist battle with Parliament and the High Court, and with an exposed civil service whose culture Cummings overtly despised (Diamond 2019). Johnson uses similar rhetoric to Trump, aimed at obfuscation and confusion. Imagining a situation where Trump negotiates with the EU, Johnson related how: "He'd go in bloody hard…there'd be all sorts of breakdowns, all sorts of chaos…. Everyone would think he'd gone mad. But actually, you might get somewhere" (cited from O'Toole 2019). This style has been paired with a much-remarked-on tendency to bend 'truth' to Johnson's own purposes. Describing the intractable problem of the Irish Border backstop mechanism, Johnson stated how:

> …any statistical estimates I give, whether that's expressed in odds of a million to one, or whatever, they all depend exclusively on the willingness of our friends and partners to compromise on that crucial point, and get rid of the backstop.
>
> (Ibid.)

Here, a no-deal Brexit was seen as almost impossible, thus evading responsibility and accountability, but that depended on the EU counterparty to do *as Johnson said*.

This highly subjective use of data seemingly issued as random "bullshit" (Frankfurt 2005). It was however coupled with the backstage-work by Cummings to tighten control over the UK state apparatus. Cummings became known as the leader of the Vote Leave campaign,[3] and was the main author of the strategy to steer towards a no-deal Brexit "whatever the circumstances". Johnson's frontstage work of politics through disorder can be correlated with Cummings' long-standing intellectual orientations. In his prior function as advisor at the education department (to Michael Gove), he wrote a treatise on education and political priorities. Its opening paragraph reads:

> Although we understand some systems well enough to make precise or statistical predictions, most interesting systems — whether physical, mental, cultural, or virtual — are complex, nonlinear, and have properties that emerge from feedback between many interactions. Exhaustive searches of all possibilities are impossible. Unfathomable and unintended consequences dominate. Problems cascade. Complex systems are hard to understand, predict and control.
>
> (Cummings 2013)

This style of thinking was compatible with the tactics of the Vote Leave campaign, and closely resembles the Trump strategy: the "interesting systems" would be the *swing voters* whose votes would tip the overall balance of the system in the direction of de-stabilisation, opening up new pathways for techno-political entrepreneurs. One way in which this was carried out was profiling and targeting of individualised messages through Facebook, distribution of made-up news stories through the newsfeed (van Dijk, this volume), including strongly xenophobic messages. This operation was only possible due to close collaborations with data analytics companies Cambridge Analytica and AggregateIQ, whose profiling and micro targeting algorithms were running on top of the normal Facebook applications, such as the "likes" function. This possibility had been foreshadowed in Cummings' 2013 treatise, then *as a warning* against the possibility to "manipulate the feelings and ideas of many people". Yet, he himself exploited exactly this option.

Cummings had broader ambitions than Brexit, concerned with the making of a radically hybridised techno-political object, and even the *re-making of politics itself. Britannia Unchained* is set against the backdrop of a dysfunctional educational, bureaucratic, and political system not fit for the challenges of the 21st century (Cummings 2013, 2019). It includes a long-standing strategy to transform or supplant the UK civil service, which Cummings portrayed as rotten and outdated (Cummings 2019). Brexit was not really the goal, but the means (and opportunity) to realise the vision of a radically reformed political system.

According to Cummings, markets, science, and technology have evolved capacities to incorporate institutional mechanisms for "error-correction and predictive accuracy" (2019), and are much better suited to deal with complex systems, feedbacks, and cascading consequences. Brexit emerged as the opportunity of the century to disrupt, "hack" and reboot the hard-drive of the political and administrative systems (cf. Cummings 2020). To "*take back control*" became a much more ambitious project than merely exiting the EU. Cummings envisioned forms of high-performance government that were much more capable of drawing upon and utilising "cognitive technologies", "dynamic tools to understand complex systems" "superforecasting" and "seeing rooms" for decision makers (Cummings 2019). Seeing rooms are operational centres designed to support decisions in complex environments through real-time big data and visualised means. Such rooms would make it "as easy to insert facts, data, and models in political discussion as it is to insert emoji" (ibid.). There was also due homage to the high priests of technoscience, as when Cummings envisaged to "phone up Jeff Bezos and partner with him on creating a base on the moon, which will in turn enable us to industrialise space" (White 2018). Such statements triggered concerns that "No. 10 be turned into a NASA control centre" (Spicer 2019), and the perception that the civil service had come under a mortal attack (Diamond 2019).

Although these may be idiosyncratic products of Cummings' imagination (Cummings 2020), their contents are familiar to students of STS. Literally connecting the dots here is a kind of cybernetic-political vision, reminiscent of prior experiments (i.e. Stafford Beer in Chile in the 1970s), and incorporating the "Californian ideology" of neoliberal technoscience (Barbrook and Cameron 1996, Turner 2006). It corresponds to the previously described shift in public meaning-making: from in principle controllable and calculable risk to the active strategic embrace of (very particular, self-serving interpretations of) uncertainty, complexity, and disorder, for many years noted by observers of biotechnology and environmental science (Sunder-Rajan 2006, Cooper 2008, Pellizzoni 2011, 2015). More than anything, the Johnson-Cummings war cabinet embodied politics as spectacle and performance, actively obfuscating the untransparent power relations thereby enabled. The War cabinet mobilised "the will of the people", yet actually enabled more centralised, more elite politics centred on technology and finance. Following Covid-19, this war cabinet is increasingly colliding with main public institutions, media, and parts of the public, as well as some more independent individuals or sectors of science, seen as *obstacles* standing in their way (Coppola 2020, cf. Rommetveit and Wynne 2017).

The STS post-truth debate: building defences against the merchants of ignorance?

An STS post-truth debate started by claims from philosopher and social epistemologist Steve Fuller (2016), about close connections between

post-truth and the methodological scepticism of STS towards scientific truth claims. This is known as the "principle of symmetry" according to which *for the purposes of explanation of what comes to be given the status of truth,* "untrue" claims are to be granted equal status as "true" ones (cf. Bloor 1976). The point of this methodological stance was that the (eventually designated) truth or untruth of any scientific knowledge-claim cannot be explained by reference to its eventual standing as true or untrue. In Fuller's view, post-truth would count as independent corroboration (Fuller 2018, 59) of strong STS commitments. This claim triggered heated responses, the first of which came from the editor of the journal *Social Studies of Science*, Sergio Sismondo (2017a), followed by reactions from Collins, Evans, and Weinel (2017), Jasanoff and Simmet (2017), and Lynch (2017). It was wrapped up by a final response from Sismondo (2017b). Whereas the debate certainly has continued well beyond the SSS discussion, it provided occasion for some fairly well-established positions to be played out in a new setting.

Sismondo and Lynch went to quite some lengths to distance STS from the post-truth debacle: there are marked differences between the kinds of debates (over conspiracies, etc.) played out in the media, and the elaborate methodological case studies displaying and analysing scientists at work. And, as highlighted by Lynch, whether one thinks that (a) principle(s) of symmetry is still relevant in contemporary STS research, it was intended and practised as a *methodological* stance, not as a philosophical or ontological one.[4] And, to some extent addressing the problem of ideology and reflexivity: the kinds of orders analysed by STS researchers point to the "construction of more-or-less stable socio-technical orders" (Sismondo 2017b, 589). This recounts the pragmatist criterion of truth as "working knowledge" (Baird 2004), and has also been mobilised in a post-truth context by philosopher of technoscience Alfred Nordmann (2020). Scientific practices and ways of knowing, once stabilised, are not easily susceptible to total relativisation where "anything goes".[5]

Such views of ideology had already been criticised by Karl Mannheim (1972/1936) as "totalising", and the argument was repeated by Collins et al. (2017, 581). According to them, this simplistic application of the principle of symmetry contributes to a totalising hermeneutics of suspicion. Collins et al. did not primarily associate this with the political economy of knowledge, but with choices made within the nascent field of STS in the 1970s. STS "cracked the pure crystal of science and showed that the social and political could have an impact anywhere" (581), and this, the authors claimed, led more or less directly to science wars and post-truth.

In this way, Collins and colleagues joined Fuller in arguing the responsibility of STS researchers for post-truth. Yet, their prescriptions were the opposite from Fuller's: the problem was not one of further opening Pandora's Box, but of how to close it. Collins and Evans (2002) had previously argued that STS arguments towards democratisation of expertise were going too

far, potentially dismantling the boundaries between science and politics. According to them, a "Third Wave" of science studies devoted to the study of expertise would have addressed this problem, but the STS community had not heeded their advice. As such, STS was at least partially to blame.

A more expansive view of the problem came from Jasanoff and Simmet (2017), where political and institutional dimensions were foregrounded. They recognised that post-truth is a problem for STS: "Certainly STS has work to do to explain why the Enlightenment project has taken a hit in recent years" (Jasanoff and Simmet 2017, 752). They laid out some main ways in which facts and norms are known to be related in action, and provided a historical diagnosis, mainly based on Jasanoff's prior analyses of the many and often obscured US science policy interfaces. In the case of *regulatory agencies*, this reflected the inability to deal with scientific uncertainty and contingency: they had reverted to a framing of risk as an exclusively scientific matter, thus falling back on an age-old strategy to purify facts to secure their legitimacy (Latour 1993). The result was that the option of dealing with controversial issues (relating to health, environment, etc.) as complex societal matters in need of careful negotiation and compromise, had foundered. Parallel developments were described in *the US courts*, where controversial issues had driven judges towards similar strategies of scientism and purification. Such de-politicisation through scientific risk management had opened up a politicised space that could be easily taken over by right-wing forces.

According to Sismondo (2017b), these responses demonstrated how STS positions could be defended against the arguments of Collins et al. and Fuller: across sites from research practices to regulatory institutions, STS research would point to "stable socio-technical orders", and these had weak or no relations at all with the cases under discussion in the post-truth debate. Sismondo could not therefore "…see much in common between any of these claims about the post-truth era and the kind of work I routinely see in STS" (588).

Steve Fuller (2018) was not content with the STS responses, which he described as "passive-aggressive agonizing" (p. 62). To see why, we must also consider Fuller's own account of post-truth. "Knowledge as a power game" is, according to him, played out mainly at a meta-level. It denotes a state of affairs in which the distinctions between meta-level rules and ordinary (scientific, political, everyday) norms of conduct have broken down. Drawing on concepts from analytical philosophy, he described how "Second-order thought is the default state of mind of someone in the post-truth condition" (p. 191). This comes quite close to a point that has already been introduced: it is not so much knowledge that is at stake as the capacity to *criticise* knowledge and the framing assumptions of one's interlocutor, paving the way for "alternative facts" to be introduced as such. The fundamental division for Fuller, therefore, goes between those who would protect established regimes of truth-telling ("Lions", following Pareto), and those who would upset them ("Foxes"), through constant questioning.

It is the mainstreaming of this state of mind that marks the post-truth era, says Fuller: an overflowing of the boundaries of official knowledge production, including STS's "stable socio-technical orders". This is done, not by anti-science, but by anti-establishment science, which is different. Fuller names this "protscience" (after the protestant reformation), the followers of which "share a desire to integrate science more directly into their own lives" (190). To Fuller, post-truth is marked by decisive risks and dangers, but these are, overall, worth taking: "…the post-truth condition marks a triumph of democracy over elitism, albeit one that potentially tilts the balance towards 'chaos' over 'order'" (Fuller 2018, 181). A good post-truther is not risk-averse but endorses risk and danger, and the greater goods thereby to be achieved. Fuller has previously promoted this as the "proactionary principle" (Fuller and Lipinska 2014), which resembles his (2018) concept of "Precipitatory governance", seeing "any major catastrophe as offering just such an opportunity for those who survive it". Risk-taking is thus for the greater good, and is closely aligned with the entrepreneurial ethos and "revolutionary science" as promoted by Popper (ibid., 189), seeing society as a laboratory.

Post-truth imaginations: new starting points?

We now see that it is not the case that "critique has run out of steam" (Latour 2004b), but rather that it has been re-directed, turned up several notches and widely dispersed. Critique, qua hermeneutics of suspicion, is performative (cf. Hilgartner 2000) and performance-like: it operates through, and targets, public affect and imagination. It may use fact and evidence, but this is not its primary target. Post-truth protagonists engage not merely with facts and pseudo-facts, but with the entire *conditions* for using science in public, redirecting them towards new ends and meanings. In this (limited though powerful) sense, critique has gone mainstream, informing and co-shaping powerful media stories, innovation agendas, political campaigns, and institutions. Reflected in post-truth performance, even if articulated in less than satisfactory ways (i.e. "Make America Great Again", "Take back control") is an underlying problematic situation, and problematisation. This goes beyond mere lying and points to a crisis of collective capacity to make sense and to work out collective problems. What seems to be needed, therefore, is a critique of critique, where strategic uses and configurations of ignorance and non-knowing are placed more firmly centre stage, not as simply opposed to the regular production of knowledge but as intrinsic to it (see Wynne, this volume). How could such a task be approached?

Firstly, we cannot simply presume the binaries between true and false, fact and fiction, science and values, to defend one and condemn the other: this position gives rise to epistemic pearl-clutching and is rejected by most participants in the debate as here described. Further, the STS and

associated philosophical debates were introduced (especially by Fuller) in terms of a (radicalised) principle of symmetry going mainstream, and for which (Fuller argued) STS should take responsibility. The STS response rejected this responsibility, arguing that it was not to blame for post-truth. An alternative position was articulated, similar to the pragmatist criterion of *working* knowledge, and stabilisation of socio-technical assemblages.

Yet, this strategy stopped short of explaining the ways in which knowledge production and uses of knowledge in public have themselves shifted. The possibility that academic analysts are somehow implicated in the same problem horizon and situation as post-truthers escaped discussion. In all descriptions in this volume, we use the lens of post-truth to observe how basic coordinates and sign-posts of science in public have shifted. Whereas this may happen in a number of ways, this introduction highlights the ways in which unknowns and uncertainties themselves have become investment resources: not merely to be managed and fended off, but actively and strategically manipulated and produced, in ways that are themselves obfuscated.[6] In the below table, I illustrate this dynamic, and the demands placed on critique, focusing on the concepts of certainty–risk–uncertainty and ignorance, which were central to this text, according to truth and post-truth regimes. Each entails a division of epistemic labour along shifting sign-posts, from certainty towards ignorance. Along with this shift, the place for critique has been displaced (Figure 0.1):

One should acknowledge Fuller's contribution in helping to make this distinction clear: two different epistemic regimes, truth and post-truth, were designated by him as main positions within the post-truth knowledge–power game. If critique and hermeneutics of suspicion have gone mainstream, and insofar as some principle of symmetry (since there are different versions at play) is one to be observed and used, one may agree with Fuller about its expansion and radicalisation. Yet, we now read it not simply as a flip of the coin in which the Foxes outfox the Lions; "critique of critique" entails neither celebration (*pace* Fuller), nor rejection, of those starting points that have fallen into disrepute. Rather, we revert to problematisations of various kinds, seeing them as arising within a certain historical and (geo-)political *situation*, and as processes of *intensification* at work, through which different constellations of knowledge and power play out. In this volume, we especially highlight three dimensions of intensification:

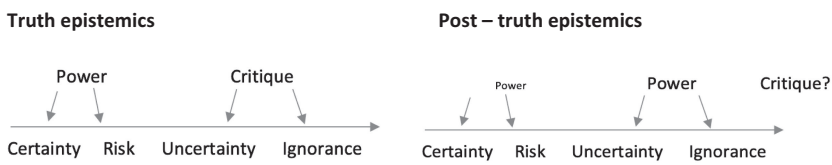

Figure 0.1 Relations of power and critique in truth and post-truth regimes.

further weakening of collective meanings, blurring of boundaries, and the politics of time. But there certainly are other ways of articulating the underlying intuition.

The question about symmetry,[7] says Lynch (2017) is mainly about a *methodological* trick, and not an ontological or epistemic one. Yet, a method rarely if ever comes without assumptions, and can be hard to disentangle from normative and epistemic commitments, even if the originator of the symmetry principle as explicitly and exclusively methodological, David Bloor, has always been clear about this (Briatte 2007). According to Söderberg (this volume) and Pellizzoni (this volume) a "method" of symmetry is easily associated with analytical operations where Nature is mutually constituted with Culture, semiotics with materiality, Science with Politics, Object with Subject, and so on. Such categories are also at work to explain the ways in which practices and socio-material assemblages stabilise (or not). And, they show their critical force, and intent, in the ways in which they are relied upon to demonstrate and argue that "things could be otherwise" (Sismondo 2017a). This then, points to a more expansive, perhaps more implicit, use of "symmetry" on the analysts' side. Here, symmetry slides towards becoming ontology or social epistemology, extrapolated onto the world as explanation, *and* relied upon as critical corrective to powerful imaginations.

Such strategies may not be all that different from the practices they aim to critique, and may even have been appropriated by them: Innovators routinely talking about co-production as simultaneous with co-creation; materiality and ontology becoming investment resources for neoliberal entrepreneurs; complexity and uncertainty as sources for political authority, or for manipulating attributions of responsibility for unpredicted harms, etc. The risk is of increasing conflation between (powerful) actors' categories and analysts' categories, a shared problem horizon or problematisation, and possible lack of critical capacity. This was displayed in the SSS discussion, and its lack of appetite to engage with Fuller's challenge.

Following this, "symmetry" as a methodological trick of the trade may be abandoned, *or* extended towards new starting points, and a critique of critique. This would entail neither celebration nor rejection of post-truth: As argued in several of the contributions, Fuller's position may end up as reactionary. The question then is not merely how to bracket out truth and knowledge while necessarily expressing (as a question, about whether original conditions apply in new circumstances of use) its always-conditional basis of validity; but also how to *identify*, *analyse*, and *critique* the production of ignorance and non-knowing, as parasitic on, possibly breaking free from, major existing regimes of truth. The relations described are, more often than not, highly asymmetrical, and can be described and critiqued as such, as arising within political economies of knowing and non-knowing, and referenced in some situation. As can be seen in several of the contributions, these are just as likely to start with politics and political institutions,

mobilising science and technology, as the other way around. Most contributions can be read as comments on Shapin and Schaeffer's (1985) claim, that *Hobbes was right* about the political: it must ultimately be imposed by sovereign force.[8] Yet, sovereignty itself is at stake, and its nature and mechanisms are shifting.

Insofar as non-knowing and ignorance are actively manipulated and mobilised (and Wynne for one (1992) has emphasised the importance in addition, of non-manipulatively, inadvertent, unknowing production, including collective forgetting, of scientific ignorance) including for political ends, one could apply a principle of symmetry to bracket out the effects of those manipulations as well, to open up towards their underlying dynamics, ways of knowing and power relations. Here, "symmetry", as a normative analytical principle, would also include the bracketing out of *rhetoric force* and frontstage work, to access and observe backstage relations, institutions, and practices. The operation of bracketing out is not on propositional knowledge only then, nor on the materiality of technology, but shifts towards *performance* and *performativity*, towards affect and imagination as collective battle-fields (Davies 2018), and towards political economy of knowing and non-knowing. This extends on the sociology of ignorance (Beck and Wehling 2012, Gross and McGoey 2015) or agnotology (Oreskes and Conway 2010, Söderberg, this volume); but (again) denotes processes of *intensification* from limited settings, to mainstream political arenas, often also incorporating digital technologies in major ways. Whatever the reader takes away from this volume, and in spite of the great heterogeneity of contributions, the chapters can be engaged with as grappling with this "expanded symmetry" approach, its exploration, articulation, and possible critical force.

Returning then to our theme of intensification, we may ask what kinds of functions, logics, or dynamics are revealed by such performativity? I do not pretend to offer a comprehensive answer here, and recognise that the volume could have been differently conceived and composed. We demonstrate that substantial resources from STS, social science, and philosophy of technoscience *can* be mobilised, yet cannot provide here an adequate account of the required new starting points. We articulate the need for them, and we make some exploratory suggestions, predominantly in terms of intensifications, tipping points, or "phase changes" in political, institutional, and cultural arrangements.

I have divided the book into two main sections, Foundations and Inquiries. Foundations deal with the origins of the debate, as social and historical phenomenon, and as part of academic and public development and discussion. Chapters placed in Descriptions do the same, but may be just as concerned with how to use post-truth as an analytical and empirical tool for opening up a field to discussion. Yet, all chapters contain some empirical analysis, and all make diagnostic efforts, so foundations and descriptions must be seen as related, as part of the same problematic and situation.

Foundations

In Chapter 1, *Brian Wynne* tells the story of his engagements with The Windscale Public Inquiry (WPI). WPI was set up against its will by the British government, to publicly work out issues relating to the mushrooming controversial THORP plant, a proposed spent nuclear fuels reprocessing plant for military and civil nuclear energy materials. Focusing on the inquiry as a ritual aimed to produce political truth, or "collectively authorised authority" through contested scientific expertise and legal discipline, Wynne argues that post-truth is not really novel, and that lying and untruth were always part of even the most rational institution or process. He shows how various elements of an environmental and scientific case against THORP and its intended succeeding developments were reframed and interpreted by the judicial rationality of the High Court Judge Inquiry Chair, into a Report and Recommendations that not only declared in favour of THORP, but promulgated the myth that an intensely controversial development threatening social disorder was decided by scientific–legal discovery, and not by political choice. While this authoritatively declared public narrative was full of falsehoods and self-contradictions, and in this sense a large-scale untruth, Wynne points out that *the falsehood worked*, in the key sense that it gave the authoritative view that, as a supposed expert discovery, implicitly from nature, human beings had no choice but to absorb and adapt to it. Wynne draws upon Ezrahi's (2012) historical idea of necessary (public) fictions as essential instruments of democratic political order, and poses the question: if such public fictions have been essential indefinitely, as with the particular example he both studied, acted in, and published on, then where was the pre–post-truth era, which a supposed post-truth era necessarily implies?

Yet, this is not to say that nothing has changed as, says Wynne, the evident contradictions between official narrative of objectively discovered deterministic decision – truth and the messy informal and backstage realities of reframing, were never exposed. In those days he suggests, unlike nowadays, there were buffering effects of important societal meanings and institutions, including legal–judicial impartiality, that have effectively silenced those contradictions. Yet, these functions have since become weakened, to the extent of no longer providing effective societal buffering between conflictive (including violent) groups, values, and interests, and their driving narratives. Wynne's notion of truth can be placed in a hermeneutic and interpretative (Sociology of Scientific Knowledge, SSK, and social science) tradition, focused on social meanings and relations rather than truth–falsity binaries. The history of such truth, and its public function, can be traced right back to the early days of modernity and a "Modern Framework", which is what renders this piece a search for foundations. Adding to this, Wynne's focus on nuclear technology provides another foundational entry-point: nuclear was *the* emblematic public technology of the post-war era, and second half

of the 20th century. Wynne points to how technosciences, from nuclear to ICTs, and risk as a modern scientised political culture, have moved further into the core of collective meaning-making. In this way, culturally and politically mediated institutions could even be seen to be collapsing into an all-encompassing naturalism fuelled by technoscientific innovation.

In Chapter 2, *Luigi Pellizzoni* describes post-truth as connected to deep changes occurring and intensifying in the political economy since the 1970s, most of which are related to the (pre-)dominance of neoliberalism and technoscience. Drawing on a Foucauldian concept of problematisation, he argues that both neoliberalism and technoscience intervene on basic levels of perceiving and projecting nature and reality. This reality has become increasingly constructivist and manipulative. Compared with other forms of truth-telling, or truth-production, post-truth denotes the intensification of such manipulation with reality at basic ontological levels, thriving on a logic of pre-emption or *pre-emptive truth*. The aim of such truth is not enlightenment, but is increasingly involved in a story of regeneration, as in re-surgent nationalist rhetoric of a mythical past. In this sense, Pellizzoni's account is different to, but also resonates with that of Wynne, as both point to the deep entanglements of myth, truth, and technoscience, especially when deployed for political purposes. In this vein, baldly put, Truth is what works. In a further resonance between these chapters, Wynne's anthropological sense of public "realist" discourse as putatively functional ordering and order-stabilising/repairing myth, is an ultimately constructivist interpretation that implies manipulation, though not exclusively deliberate on the part of any social agent(s), but also historical-cultural. In Pellizoni's view, the STS discussion of post-truth failed properly to grasp these interconnections, as they themselves were too strongly invested in the "new materialism" and an "ontological turn", shared across large segments of the social sciences and STS. The pre-occupation with notions of "symmetry" and its offsprings (such as co-production and assemblage theory) does nothing to counter these effects, and shares in the same problematisation, through the strong – and laudable – intention to overcome dualisms (between Nature and Culture, Subject and Object, etc.). Whereas we cannot go back to old dualisms, Pellizzoni argues the need to establish new starting points, in the social sciences and governing institutions alike, that could be used for renewed critique.

Chapter 3 is written by *Johan Söderberg* and recaptures some of the original sense of the word radical, as going to the foundations (possibly cutting them down). In this case, these are the founding assumptions of the field of science and technology studies (STS) in the 1970s. Some of these assumptions were built into a concept of symmetry that, says Söderberg, has become second nature to the field. These assumptions have now come into question by post-truth, rendering this "STS' moment of post-truth". Söderberg argues that the price of establishing the field was to let go of its roots in Marxist theory, and that a prior notion of critique of ideology was replaced by notions such as "symmetry" and "reflexivity" (especially in the sub-field

of Actor-Network-Theory (ANT) to lesser extents in the Sociology of Scientific Knowledge (SSK)).The claim is that post-truth demonstrates how the table has been turned on truth-telling, with science no longer occupying a hegemonic space, and even relegated to the position of the underdog. Hiding behind STS's critique of scientism and positivism is an unresolved relation to the critique of ideology. According to Söderberg, post-truth has created fear that critique of ideology will slip back in. Söderberg's chapter outlines two STS (and philosophy of technoscience) strategies for dealing with post-truth, and for fending off the claim that it is somehow to blame: first, the argument that post-truth is not really new, and is rather an outcome of the technification of the sciences, labelled "technoscience". Second, there is the argument, grounded in a constructivist criterion of demarcation, to distance the STS scholars' object of study from those of the post-truth debate. Finding both alternatives wanting, Söderberg introduces a third line of investigation, ignorance studies, in which asymmetric relations and knowledge forms are not denied, but critically articulated and contested. On this account, ignorance studies and a re-loaded critique of ideology, pose valuable alternatives and starting points for critique.

Inquiries

Darrin Durant's Chapter 4 is a reflection on, and critique of, important cultural and academic sources that inform thinking about post-truth. Durant sees post-truth not merely as a passing phenomenon, but as an ongoing intensification of long-term trends for which many sectors of society share responsibility. The contribution takes as its starting point the differences between the works of Huxley and Orwell, and argues that there is a propensity amongst post-truth academic and more cultural–political commentary to presuppose an Orwellian reading of externally imposed control, rather than an overflow of information, entertainment, and sensuality (Huxley). This reading is pursued through various tracks, demonstrating the Orwellian influences on STS scholarship, post-truth academic literature more broadly, and climate and energy policies in Australia. If the Orwellian reading is presupposed, the quite common strategy of opening up issues to make them public, and demonstrating how "it could be otherwise", can be criticised for feeding into, and in that sense contributing to, the post-truth condition. If a Huxleyan reading is pursued, then the question will not be how to counter Big Brother, but rather how to provide closure for controversial matters under conditions of constant overflows of information and "gaslighting". Invoking controversies from the Third Wave debate in STS, Durant argues that STS accounts of post-truth need to, firstly, recognise the value of aspiring to achieve truth, or truthfulness, for public and political life; and second, that there is a need to pay attention to those parts of democratic theory that could help us localise and articulate institutional sites, or starting points, for democratic closure (and not just opening up). One could also see a potential connection here with Wynne's analysis – albeit a critical

one – insofar as both ask about *what counts* as democratically legitimate "closure" in a world of political and value conflicts and where science is supposedly a resource for all.

In Chapter 5, *Ingrid Foss Ballo* and *Nora S. Vaage* analyse the interrelations between post-truth, public reasoning, and smart technologies and projects. They argue that we are presently passing through a "time of interregnum" (Gramsci), in which the traditional role of science in disciplining and guiding public reasoning has to large extents been taken over by technoscientific imaginaries aiming to generate futures seen as desirable by powerful actors. Yet, these futures imaginaries are not shared by everyone, in spite of their in-built propensity to speak to different worlds and different actors involved in innovation. In this sense, smart technologies and the futures imagined through them, can be said to intensify and prosper from an underlying post-truth condition of weak or lacking shared understandings. This argument is pursued through three analytical empirical sections, dealing with the making of futures, the modular characteristics of smart visions and technologies, and implications for broader public engagements. Whereas the main dynamic may be towards the closing down of collective futures, Ballo and Vaage also identify opportunities for opening up towards other forms of engagement. In this way, major interpretative concepts from social science, STS and philosophy, turning on the imaginary, are deployed to critique the post-truth – producing characteristics of normal, taken-for-granted innovation and development. The chapter thus comes close to the notion of truth and progress as social and public meaning, and the close entanglements, as described by Wynne in Chapter 1, of such "truth" with political authority.

In Chapter 6, *Niels van Dijk* reverts to an old descriptive trope of classical ANT, of "unscrewing the Leviathan". Whereas ANT gets a rough beating in some of the other chapters, it is actually hard to see how practices such as the digital manipulation of elections could be described without using the networking metaphor, indicating its continued usefulness. In this chapter, van Dijk takes up an unmet challenge from the STS post-truth debate, of "describing the infrastructures of post-truth". He expands on a notion of symmetry, in similar ways to this Introduction, shifting the focus from the production of knowledge, and from human–non-human relations, onto the production of ignorance and disinformation. The empirical sections deal with efforts of societal actors themselves, to unscrew the Leviathan of the existing political order, and especially the case of Cambridge Analytica, active in both the Trump election and in Brexit. Van Dijk relies on a variety of sources, revealed through controversy, all of which represent specific ways of opening up disinformation activities to closer inspection. These are, firstly, the works by digital journalists to track disinformation networks, second, regulatory efforts to pry open the workings of infrastructures of post-truth using the force and apparatus of (privacy, anti-trust, media) law and politics (in this case, mainly the UK Parliament). The chapter more than indicates the continued relevance of ANT, and demonstrates some

ways in which it could be re-imagined to tackle the techno-political quagmires of post-truth information wars. As a slight contrast to Latour's initial (1993) argument, (but agreeing with Humpty Dumpty!) in this chapter, the conclusion seems to be that, given post-truth conditions, Hobbes may have been right after all.

Chapter 7 is written by *Kjetil Rommetveit* and *Niels van Dijk*, and can be read as a continuation along similar lines as Chapter 6, but focusing more on legal-regulatory hybrids. Rommetveit and van Dijk make two interrelated claims: first, they pursue the claim (from all the chapters) that post-truth is not a mere surface phenomenon, but rather grounded in the general production of knowledge (and ignorance). Second, they connect post-truth conditions to the "hyper-truth" status of digital innovation agendas, and governance of digital technologies. The significant issue at stake is one much commented on in general STS (and related) scholarship, namely the intentional blurring and merger of boundaries (hybridisation) in technoscientific and digital innovation. The chapter makes a twist on this analytical approach, by pointing to two cases wherein such hybridisation becomes problematic: the design of privacy (a fundamental right) into ICT technologies, and a debate over personhood for robots. Both are "post-truth" insofar as they intentionally blur the normative with the factual and technological. Hence hybridisation itself has become part of mainstream legitimation, and therefore cannot be relied upon by scholars as a critical corrective to idealised and simplified accounts based on science or law. Stated differently: there is little sense in relying on non-human actors as critical corrective to "subject-based philosophies" when powerful industrial interests are planning to bestow rights on machines. And, a related notion of boundary work becomes equally inadequate, when legal rights become matters of engineering into insipient technological systems. The authors argue that digital technologies bring a shifting legitimatory strategies, and that, therefore, a concept of "boundary fusion", according to which sources of authority are merged together, is a pertinent extension on the idea of "boundary work", according to which authority is made by separation of sources, such as science and law.

This volume has been a long time in the making, and has been delayed by the Covid-19 pandemic. It has been followed by anti-racist manifestations, culture-wars, allegations of 'wokenness', the Covid-19 pandemic, anti-vaccine movements and conspiracy theories, on the political left and right, in the western world and beyond. A chapter on xenophobia and racist discourse was planned to be included in the book (but did not make it in the end due to Covid-19). And, references are made to the main event within this contemporary tumultuous public landscape, Covid-19, in various chapters. For all of these themes, however, we would claim that they should not be seen as distinct events. Rather, they constitute well-known traits of knowledge, society, and modernity, whose dynamics have intensified. In this sense, the book ends where the Covid-19 story begins.

Notes

1 The "Science Wars" were fought (in the 1980s) over the authority of science and constructivism. Practitioners of Actor Network Theory have spent considerable energy in distancing themselves from "Merchants of doubt" arguments and actors (cf. Oreskes and Conway 2010) in the area of climate science (see Latour 2004a, 2013), and from the kind of simplistic constructivism enacted and implemented by policy makers (cf. Law 2010).
2 Whose motto changed to 'Democracy Dies in Darkness' around the same time.
3 Cummings role was portrayed in the BBC drama *Brexit: the uncivil war*. The interrelations with Cambridge Analytica and AggeregateIQ are described in the documentary *The Great Hack*.
4 This is not obvious in the case of Latour and ANT who expanded it to human–non-human relations, hence ontology and ontological politics (Pellizzoni 2015).
5 As David Bloor, originator of this symmetry principle as part of his "Strong Programme in the Sociology of Scientific Knowledge (SSK)" was fond of pointing out, established scientific knowledge is an institution – and institutions are normally very solid, adaptable to many external forces, and extremely challenging to dismantle.
6 In Foucauldian terms, we may question whether it is sufficient to regard power and knowledge as intrinsically interwoven (as in the formula power = knowledge), see Pellizzoni, this volume, and Söderberg, this volume.
7 Philosophers are well accustomed to such tricks, as in Husserl's *Epoché*, Descartes' methodical doubt or Rawls' Veil of Ignorance. *Any* critique so understood needs some 'trick' to put powerful assumptions aside, for inquiry to get started.
8 Although Bruno Latour initially opposed this proposal, he later endorsed it as a characterisation of politics. And, as seen in the introductory quote: so did Humpty Dumpty.

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