

We Need to Talk (More Wisely) About Wisdom:

A set of conversations about wisdom, science, and futures

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Abstract

This paper is a structured dialogue between the four authors on the question “what might constitute wisdom for the future?” With each author exploring a distinct but related angle we first consider four aspects: The traditional view of wisdom linked to philosophy and the humanities and how the development and subsequent crisis of science has eroded this; how knowledge and wisdom differ and how embracing complexity might be required to make wise decisions; how wise decisions can be contradictory across different ‘levels’ and how it might be possible to navigate these differences; and how wisdom involves balancing learning from the past whilst being open to the future. The second part of the paper entails reflections and comments on each of these four aspects done by two of the authors on the inputs by the other two, and vice-versa. In the third section, we share views on how wisdom is linked to action; and to decision-making and even reflection; and not just to knowledge. In assessing what constitutes wisdom for the future, our conversation suggests it is important to acknowledge and address the crises science is currently undergoing. This includes practices which embrace uncertainty, ignorance and complexity. We discuss three approaches which can be deployed, alone or together, to that effect. They are scenario planning as a tool to contemplate multiple possibilities and navigate the future; Post-Normal Science as a theory for understanding uncertainty; and hosting and supporting more meaningful and more courageous conversations.

Introduction

This paper had several beginnings that came together in this text. Rafael and Jerry regularly meet to assess how the ‘feral futures’ that they analysed in 2011 (Ramirez & Ravetz, 2011) unfold. We came to agree that it was becoming clear that the exclusive focus on STEM (science, technology, engineering, mathematics) in education is unwise (c.f. Smith and Watson, 2018). In fact, we realised that some people do not think of STEM as a choice, but rather as a religion. For example, a Trustee appointed by the UK’s Prime Minister to the Board of the Science Museum defines herself as a STEM evangelist (UK Government, 2016). When the call for this special issue of Futures on Wisdom and Futures arrived, we decided to write another piece together. We wanted to deepen and better focus our insights on the roles which the Humanities and the Arts might play in addressing Climate Change, which is something we had explored with seventy other participants in the 2017 Oxford Futures Forum, whose theme had been ‘The Oxford Scenario Planning Approach and the Climate Imaginaries of the Arts and Humanities’. We found funds for a research assistance to help us with the relevant literatures. We hired Leila Varley, who quickly proved she could be a very good colleague and co-author as well as a research assistant. We then asked Bill Sharpe to join us as a reflective practitioner involved in addressing hope (Sharpe, 2013). The four of us met and agreed on the architecture of the paper as follows.

We decided that in the first instance, we would each write less than six hundred words on related but distinct angles on wisdom. Jerry would write on how wisdom has been sought over time, how science was

taken to become a potential provider of wisdom, and how shortcomings regarding this role have arisen. Rafael would consider issues regarding at 'what level' wisdom should be practiced, and how it would be possible to work across these levels. Leila would describe how the increase of knowledge has shaped its architecture and affected the relations between wisdom and knowledge. And Bill would discuss how the institutionalisation of knowledge, with its bias towards the past, can negotiate the challenges of the future and how this constrains and requires wisdom.

Then, in a second part, we agreed that two of us would comment on and build upon the writings of the other two colleagues; so the second part is already a reading of the first one. This means that for the readers of this paper, some of the reader's work has already been done for them (you are welcome!).

Finally, the concluding part compares the two commentaries in the second part.

Part I

Wisdom - an historical approach (JR)

We need not attempt a precise definition of wisdom; we need only understand that it is a sort of knowledge that goes beyond the ordinary. It might be used in response to extraordinary challenges, or to provide special knowledge as of the future, or it could even be a sort of reflection on some aspect of the human predicament including knowledge itself.

The original sources of wisdom had supernatural status; thus there were the holy men or shamans of traditional cultures, who were gradually supplanted by oracles or divinatory practices. Then there arose literary sources, as in proverbs, and more recently, essays by authors considered to be wise. The imparting of wisdom was considered to be an important part of education. Writings from classical antiquity, such as those of Plato or Seneca, were considered excellent sources of wisdom for the young. The Oxford University degree course called Greats, inspired by the distinguished classicist and educator Benjamin Jowett, produced young men (and only much later, women) who had a calling to the wise management of an enlightened empire on behalf of their Queen.

But the reaction against classical wisdom had long since set in; and was indeed at the core of the seventeenth-century scientific revolution. The words of Descartes (in the *Discourse on Method*, Part 1) express his fateful rejection of humanistic learning, motivating its replacement by an impersonal mathematical science. "From my childhood, I have been familiar with letters; and as I was given to believe that by their help a clear and certain knowledge of all that is useful in life might be acquired, I was ardently desirous of instruction. I found myself involved in so many doubts and errors, that I was convinced I had advanced no farther in all my attempts at learning, than the discovery at every turn of my own ignorance."

Descartes' faith in science has been echoed in a report from a leading American liberal arts college (mine!), Swarthmore. In a 2014 faculty debate on the College's mission statement, faculty members from all three divisions criticized the notion that the college should aim to teach virtues such as courage, a sense of justice, a feel for beauty, and perseverance, on the ground that "there are no discrete, objective tests for possessing these things." (Elridge, 2018). This position may have arisen partly in reaction to a perceived unhealthy state of the humanities in American higher education, forcefully analysed in the book *The Great*

Endarkenment: Philosophy for an Age of Hyperspecialization, by Elijah Millgram (2015). Whatever the causes, this statement indicates that amidst all the turbulence of contemporary academic life, there are some influential sections who still believe that Science provides security, and (in the terms of this study) is still the sole source of wisdom.

Can Science fulfil this role? Scientific research is now afflicted by a 'reproducibility crisis', and science advice, where wisdom comes into play, is becoming understood to be a very human creation. Sir Peter Gluckman, perhaps the most eminent person in that field, is very frank. Referring to 'The challenge of science at the policy-societal nexus', he cites: "Too much science, much of which is in disciplinary silos; often incomplete and ambiguous at the time policy choices are needed; the changed and post-normal nature of much science." (Gluckman, 2018). This is a long way from our inherited assumption that for any policy problem there is a collection of scientific facts that determine the correct solution. So the question is not merely the philosophical issue of whether in principle science could conquer our ignorance of the future, but rather concerns the practical issue of what reliability science advice has

This question has some urgency. If a general disillusion with science were to arise, resulting from its acknowledged uncertainties, or conflicts among experts, or even corruption among established authorities, then the legitimacy of our whole secular system of governance could be challenged. We have already seen signs of this, as in the populist rejections of the Measles, Mumps and Rubella (MMR) vaccine and of global warming. But it is hard to imagine a return to traditional sources of wisdom, and so we must envisage a way forward. As our understanding of our civilisational predicament matures, we are coming to live with the awareness that no external agency is going to solve our problems for us. Whatever wisdom we achieve will necessarily come from our own collective efforts; perhaps that is the wisdom of our generation.

Knowledge, complexity, and wisdom (LV)

If wisdom were only knowing, then humanity has become inarguably more wise over time. We are now in a position where we can no longer just split the atom but split the electron; no longer just explore the sky, but explore our solar system; and understand so much in between. The pace of growth, of knowledge and of human advancement has been staggering and exponential.

Before the Enlightenment, Millgram (2015, p.27) argues, it was possible for a reasonable person to "know his way around pretty much everything there was to know": enough to form thoughtful judgements and make contributions. Since then, a combination of scientific discovery, technological change and increased global interconnectedness have not only taught us infinitely more things about ourselves and our world, but also resulted in a plethora of information. Today, the idea of knowing and understanding everything seems ludicrous.

As our collective skills and knowledge have grown, the inevitable response has been to divide our shared body of knowledge into much narrower domains, consigned to silos of expertise. Millgram shows how much we have become a society of specialists, each with their own language. However, with greater depth of knowledge comes a lack of breadth or ability to see outside of the silo. Rather than working together, specialists have become the proverbial blind men arguing over an elephant: Is it like a wall, a rope, a snake, or a spear? Each is convinced of the primacy of their perspective; all are unable to perceive the other pieces and put together the bigger picture, or even have the language to articulate themselves to each other.

While specialists can have a deep and great knowledge in their field; as our society advances technically, a lack of broader thinking can cause or exacerbate existing problems. A systems approach shows us that as every problem has an environment, addressing 'x' will also have a corresponding reaction in 'y'. The result could be an unwelcome unintended consequence as profound as the initial problem (Churchman, 1979). Take for example the invention of cling film with its enormous positive impact on reducing food waste and improving food security, yet clogging our landfills with non-biodegradable plastic. Similarly; social media, a powerful tool for connection and collective activism; is also a conduit for fake news, aggressive trolling, whilst wielding huge psychological influence over users from data mining. Perhaps the most profound example is nuclear power, providing an alternative to finite fossil fuels, yet producing the most powerful weapon in existence as well as toxic waste radiation.

If our world is too complex, our knowledge too broad, our information too great for one person to fully understand, what is another option for wisdom? I would argue that the wisdom necessary for a wise future does not just lie in knowing. Wisdom lies in the ability to take disparate pieces of knowledge, sometimes incomplete, and see a bigger picture. Unlike the blind men, wisdom would have been to recognize that that each perspective could be partially correct, and find a way to perceive the elephant; taking into account the collective information.

I would argue that one more key trait is required: humility. While a specialist may know all in their field, a wise person with a future lens must accept what they do not know in order to be able to ask the right questions. As my co-author Jerry wisely once articulated, understanding the boundaries of knowledge, where ignorance starts, is important as the knowledge itself (Ravetz, 1986). Humility means acceptance of the limitations of our knowledge and the possibility of failure. It is only then that we will truly learn the lessons to make us wise.

Are there scale issues concerning 'wisdom'? (RR)

To seek wisdom, some travel across the world to a guru or Ashram; others find it wiser to hone their wisdom right where they live and act, perhaps –as in Zen- through wiser breathing.

Beyond geographical and temporal choice, another issue is problematic in determining how to best pursue or approximate wisdom: at what 'level of intervention' or 'logical typing' (Whitehead and Russel, 1911) should wisdom best be sought? For example, Elinor Ostrom (1990) referred to "Multiple levels of analysis" in her book *Governing the Commons*. She separated operational from governance from constitutional rules (pp 50-55): at which level is it wisest to intervene? Think of this as a 'Russian Doll' question, where apparently identical hollow dolls of different sizes are fitted inside the next level (up or down). The question I here examine is whether being wise at one level implies - or indeed, facilitates - being wise also at lower levels; or whether –on the contrary - being wise at one level implies - or indeed, facilitates - being wise also at higher levels? A third logical option is that the level of intervention of wisdom has no effect on any other level(s), either way.

Ecologists (e.g.: Gunderson & Holling, 2002) would posit the response to this question that wisdom might best be deployed at the holistic level - planetary (if not inter-planetary) well-being is where the results of being wise have the most impact. Presumably the argument would be that obtaining the practice of

wisdom at the level of planet Earth would prevent unwise decisions at lower levels from ending the planet. But is this really so: must wisdom be exercised outside-in? Does it really 'trickle down'?

It is not self-evident that one can choose the level of intervention: the planet as a whole is not easily reachable to everyone. The scale one can act on might be bigger if you are the CEO or President; and smaller if you are the primary school teacher or pilot, but even in 'smaller' scales it may make a difference (for example, there is up to 10% fuel efficiency per commercial flight depending on flying style, with air travel contributing 2.5% of greenhouse emissions).

Also, a policy which seems wise at one level may appear unwise from another. So an evaluation can toggle between positive and negative as one goes up or down the levels of the system. An example is the transport of oil from the sands of Alberta. The Canadian government's investing in a pipeline was justified as a reduction of risk when compared to rail transport and as guaranteeing continued extraction, protecting jobs. But many argued that this intervention is at odds with one at another level, as it prevents the Canadian government from its meeting its Paris COP 21 agreement obligations; seen as very unwise (Abreu, 2018)

This Canadian example suggests that acting wisely across levels of analysis is fraught with difficulties. No single straightforward strategy (no super-wise algorithm) to guide wisdom on where or at what level to most wisely engage a system –if one has the choice of where to engage is available. In such circumstances, wisdom across levels would be ideal – but is it attainable?

Thus the presence of multiple levels, both of analysis and in and across operational systems, requires a practice of wisdom which can cope with severe uncertainty across levels and which ideally also reconciles opposed worldviews. How might this be achieved?

Wisdom's past and the future (BS)

When do we look for wisdom, for wise advice? When faced with the necessity of choice and action in a situation that we cannot comprehend, where outcomes contain unpredictable hazard, where every alternative that has in it something of the good we desire is inextricably bound up with something we want to avoid. Should I use force to preserve peace, or stand for peace at any cost, sacrifice a relationship to stand up for a principle or risk everything to preserve a relationship? Then we seek out those who can sit with us and bring their own understanding to bear, and help us see our predicament in ways that might reveal a possibility, reduce the hazard, avoid the harm.

There is a paradox in the creative process of life: only through the structures and institutions of what has been made known in the past can the future be engaged in the present moment, but only through openness to the irreducible novelty of the moment can it be lived to its full potential. All our knowledge of the world is from the past; we carry maps built up from the paths we have travelled, but we are always moving into a world of the not yet known. While the future can be held within the familiar landscape of the past we can consult our experience, or expert knowledge, as our guide, but when we reach one of those places where our gaze cannot see through the fog, we have to move forward while remaining open to that which we do not yet know. Anyone who has been lost on a mountain in the clouds will be familiar with this feeling; wondering how to find a safe route ahead knowing that there is hazard all around and

perhaps a thunderstorm coming in. Wise action is based on mountain craft – how to use the few clues there are to the lie of the land to pick a safe route to descend or find shelter to sit it out.

Moving into the unknown, learning and adjusting as we go, calls on the skills by which knowledge is built in the first place, on the ways that we encounter the new and bring it into the realm of the known. All through our lives we are constantly making the trade-off between reducing the next moment to the familiar categories and patterns of life, or opening ourselves to whatever is new and responding to it in fresh ways. To learn language we spend our early years surrounded by a community of speakers, gradually moulding our own capacity to speak any language into the particular one in which we find ourselves. Life, that of ourselves and others, circulates through language, and we play our part in carrying it forward into the future, melding our unique experience with that of others in the pattern we leave behind.

Acting wisely towards the novelty and potential of the future demands the capacity to be aware of the structures that we are bringing to bear from the past, and the way they both enable and constrain our appreciation of the world in the present moment. If we mistake the map for the landscape of the future we are held captive in the institutional knowledge of the past. Wise action, including determining what wisdom shall mean for us, and who ‘we’ are to make the determination, requires using what we do know to engage creatively with what we don’t.

Part 2

In this part we comment the first four essays in Part 1 above.

In the first half of this part of the paper, Leila and Rafael comment on Jerry and Bill; in the second half, Jerry and Bill comment on Rafael and Leila.

Leila and Rafael comment on Jerry and Bill

Jerry suggested that it is “hard to imagine a return to traditional sources of wisdom”. While this may be so, it invites another question – even if one could return to such sources, would that form of wisdom help engage the complex and interconnected world which has arisen? In other words, even if one were to be recognised to be ‘wise’ in terms of traditional views of the term, would such ‘wisdom equipment’ be well suited to attend to today’s problems?

Bill put that in terms of the potential disconnect between past experience and future requirements. In our individual reflections in Part 1, the focus mostly was on wisdom in the present, and its suitability. This invites a further question – when is that suitability established: at that time, or after the fact? One could make the argument that wisdom, or perhaps wise decisions, can only be judged as wise in hindsight, and are not always assessed fairly at the time. Nelson Mandela’s forgiving of his Robben Island gaolers was heavily criticised by the African National Congress, yet in the light of the consequences of the action, this extraordinary act is now widely held up as very wise, and as having played a key role in setting an example and reuniting the country post-Apartheid.

If this is so, maybe an act of wisdom can be well served with scenario planning, imagining how it will be appreciated from a perspective in the future, as opposed to how it is appreciated now. A student of

terrorism, Professor Louise Richardson, has suggested that the US policy approach to 9/11 at the time was unwise: they over-reacted, she assesses (Hurst, 2015).

As to how wisdom can be attained, Bill's mountain craft analogy suggests that wisdom can be seen as intuition: "use the few clues there are to the lie of the land to pick a safe route", and also as served by experience. This proposition invited us to wonder who exactly might be able to intuit from the clues available, and to ascertain from experience which clues matter the most to act wisely?

A well-known and very popular approach to scenario planning is the 'intuitive logics' school. As Ramirez and Wilkinson put it,

Recent research suggests however that the name 'intuitive logics' for this approach is not unproblematic: the validity of intuition has been found to be difficult to apply to the situations in which scenario planning is called for. Khaneman & Klein, "starting from the obvious fact that professional intuition is sometimes marvellous and sometimes flawed", attempted "to map the boundary conditions that separate true intuitive skill from overconfident and biased impressions", concluding that "evaluating the likely quality of an intuitive judgment requires an assessment of the predictability of the environment in which the judgment is made and of the individual's opportunity to learn the regularities of that environment. (They found) that subjective experience is not a reliable indicator of judgment accuracy" [18, p. 515], parentheses added).

So those with the most experience will not necessarily make the wisest decisions, and if the Lehman collapse is something to refer to, it had the most experienced CEO in Wall Street at the time, whose moves in retrospect have proven unwise, compared to those of some of its peers, which survived the crisis.

So if historically wisdom has been held with elders, and in many societies today this still is so, it may not be of help for people facing turbulent conditions. Bill suggested that it is "only through the structures and institutions of what has been made known in the past (that) the future be engaged in the present moment". But what if the experience of the past is not of help? To be guided by the past, particularly if it is 'only' the past, can set an unrealistic vision of the future based on 'like today, but later' rather than 'another today, later'. Human beings often seem to fall victim to "*active inertia*" (Sull, 2009) or 'dynamic conservatism' (Schön, 1970), more a dynamic seeking to keep things as they are than an inability to change one's mental map of the world and conceive of future change. An instance is a well-known quote attributed to Henry Ford about the growth of the car "if I'd asked people what they wanted, they would have said a faster horse".

Bauman in his book *Liquid Times* (2007) invites us to think of wisdom not as acquiring knowledge but as letting go of outdated conceptions: "*a swift and thorough forgetting of outdated information and fast ageing habits can be more important for the next success than the memorization of past moves*". As Bill put it, it may become necessary in the future to "be aware of the structures ... from the past, and the way they both enable *and constrain* our appreciation of the world in the present".

As such, in holding wisdom in and for the future, it would appear that it may become necessary to look beyond the wisdom of the past, and beyond those with experience, and to ignore some of that; and to also create communication with those unburdened by experience who can offer other perspectives, who may

help the collective to be better able to see and imagine what may today remain unknown, such as through intergenerational dialogue. In reflexive terms, we have attempted to do so in this very paper!

So if there is no one place where wisdom is held, nor a specific location or places where one can go to attain it, wisdom may involve more courageous conversations with an eye of how it might be assessed from the future. This is exactly what scenario planning enables.

The closest to a courageous conversation humanity might have come is through science since the Enlightenment, as Jerry describes. But it is important to note that with this growth of science, has come an equal growth of desire for certainty, which is a misunderstanding of what the nature of scientific knowledge is. Science cannot deliver certainty, particularly when post-normal characteristics are recognised.

Jerry's analysis of Swarthmore's rejection of teaching courage, a sense of justice, a feel for beauty and perseverance, on the grounds that there is no discrete or objective testing for these shows that the misunderstanding of science has not (yet) been well served by the humanities. Jerry also shows how science is not, or at the very least is no longer, a standard of objectivity.

Flawed science, such as the work concerning tests of antidepressant drugs, now suffering from a "reproducibility crisis" (where prior reported findings from experiments cannot be replicated) extends beyond the halls of academia to pharma labs, to public policy and to drug prescription. When such situations are discovered, the public policy response often amounts to throwing out the baby with the bath water, and science has begun to lose the trust it requires to play a role in addressing challenges such as those related to climate change.

A crisis of trust is also having the effect that people no longer know where to seek truth (Heckscher, 2015). Hacking, fake news, malfunctioning science, and growing inequality supported by austerity all make stability more perilous, whether it is of liberal values, democratic processes, market behaviour, or psychological wellbeing.

A wise future would become able to acknowledge these challenges. There are numerous ways in which this could happen. Here are three: The concept of Post Normal Science (the most highly cited paper in this Journal's history) proposed by Funtowicz & Ravetz (1993) and its elaboration, Post Normal Times (Sardar, 2014), sets out a programme for one such attempt. A wise future would also seek to assess wisdom from future perspectives. Scenario planning (Ramirez and Wilkinson, 2016) is another such attempt. A wise future would publish conversations to test and contest courageous conversations. This special issue is one more such attempt.

Jerry and Bill comment on Rafael and Leila

Wisdom is intimately related to decision and action, even the action of engaging in reflection.

The relation of wisdom to knowledge is discussed by our colleagues, and they explore many of the systematic difficulties involved. We are reminded that there is now just too much knowledge out there for anyone person to take it in and integrate it sensibly.

The very choice of what anyone should try to know in some way or other, and what this person can safely leave in ignorance, itself requires wisdom! Similarly, when one is faced with a decision on a policy problem, one must be aware of the different levels at which the policy has effects and implications. And again, there is no algorithm which can instruct us on which level to choose wisely.

It is important to notice that these considerations effectively transform our ideas of what wisdom is and how it is to be deployed.

Traditionally wisdom was recorded in utterances whose content exhibited their special character. From the pronouncements of oracles to the citing of proverbs, their source was unproblematic. Either you were wise and could say and do wise things, or you weren't. You might have needed a lengthy education and decades of experience before arriving at that status, but the sourcing of creating wisdom was taken for granted.

There was one crack in that image of perfection, which is actually quite important for understanding our present predicament. In the early modern period there was a movement of doubting whether the received wisdom was all that wise. There were various notorious 'sceptical' authors, and doubts about wisdom were important in the formation of the modern scientific world view. In his professedly autobiographical account of his disillusion with his humanistic education mentioned by Jerry above, Descartes singled out the ancient moralists, whose product was the purest wisdom, for a particularly savage and crucial attack. In contrast to mathematics, which he found reliable but undeveloped, he compared their writings to "very proud and magnificent places that were built on nothing but sand and mud" (Descartes 1638). Bacon (1886) was more humane; he only mentioned that in his youth he had compiled a list of wise sayings, and found that on every issue they could be found on both sides. For Galileo the issue was quite simple; he dismissed humanistic learning as merely 'probable and plausible' and proclaimed that science was 'true and necessary' (Galileo 1632). Those denials are at the core of our intellectual heritage.

Coming to the present, important aspects of our predicament have been well expressed by Rafael and Leila. If we want to draw on knowledge for our wisdom, there is just too much of it out there. So we must choose, which knowledge do we want, and how do we know whether it is appropriate to our needs. There might well be proverbs or maxims in a particular world of experience to help guide our choice, but they cannot make our decision for us. Similarly, actions occur in a complex world, with a plurality of perspectives and of systems levels. As Rafael has shown, what is wise at one level might prove not to be so at another. So the debate over wisdom of policies ranges far beyond the particular action, but even more over its framing. Does that lead to an indefinite regress, in which irreconcilable world views become more crucial than 'facts' in the defining of debates over policies? Not necessarily, but this too is not totally preventable by 'reason' alone; not anymore.

A crucial question for our present enquiry is whether Science can still presume to render all those problems irrelevant. That was the promise of the proponents of the Scientific Revolution. And the impersonal form of expression usually utilised to express scientific knowledge can easily be interpreted as a quality of objectivity, and hence of truth, in its formation. This is the deep, defining illusion of modern science 'education', from which recovery is usually protracted and painful if it occurs at all. But as soon as we consider the wise application of science, which is after all a leading question for our time, the same

dilemmas identified by Rafael and Leila inescapably recur. The flow of new scientific knowledge has become a tsunami; any one person or even well-functioning team of experts can master what is numerically an insignificant fraction of the whole. Even on a defined policy problem, 'the literature' is massive. Worse, almost all of it cannot be taken as true and relevant on trust, and so requires quality assurance, in which the exercise of practical wisdom is essential. Policies utilising science are subject to similar challenges, since not only systems levels but incomplete and corrupted knowledge must be dealt with.

The analysis of Rafael and Leila can also be understood as a philosophical critique of the foundations of wisdom. As we have seen, Leila's analysis of the quantity of relevant information leads to an awareness of the inevitability of ignorance. Further, that ignorance must be managed. We are aware of some of that which we do not know, as (for example) the titles of journals that we do not bother to read. In the way, we are incessantly managing our ignorance when we delete unwanted or uninvited items which appear in our email. With each one, we might be depriving ourselves of crucial information; but we must endure that risk, since otherwise the price would be total submersion in a sea of useful (perhaps) and useless (often) information. There is thus a complementarity between the knowledge that we have achieved and the personal ignorance that we have created. The one is impossible without the other. If we scale up this phenomenon, we will have what Rayner (2012) has called "the social construction of ignorance". This is all too easily dismissed as bias or even malevolence. If someone has been carefully spoon-fed with facts all through a lengthy education in science, the idea that one must constantly make choices, perhaps even sacrifices of possible knowledge, is very hard to take on board. But it can even count as a difficult but essential piece of wisdom.

Similar considerations apply to Rafael's analysis. We have mentioned the complexity of the context of action, even in use of science. In a systematic analysis, we mention "the law of unintended consequences" which is more familiar to social scientists than to natural scientists. Among the people whose job it is to keep the systems working, a common expression is "Murphy's law". The standard formulation of this is, "whatever can go wrong, will go wrong." Although this "law" has been denounced by Prof Richard Dawkins (2012), for ascribing motives to inanimate matter, it is widely used as expressing a craft wisdom, as well as providing the occasion for numerous jokes. There is however a serious side to it. This is that there is a scarcity of formal education, even in science-based "practical" fields, which alerts students to the systematic possibility of things going wrong. In fully professional fields, advanced training and the possibility of punishment for errors serves to impart this essential wisdom. But there are many fields, notably those applying mathematics to human affairs, where errors go unpunished even when they are disastrous, and so pernicious vacuity becomes deeply intermingled with competent practice. As we have experienced with financial mathematics, such lack of wisdom may indeed become the undoing of our civilization (Ravetz, 2008).

Our use of scientific knowledge therefore always takes place in a context in which there will be factors beyond the scope of that scientific knowledge. This extended context will inevitably include consequences in space and time of which we are partially or wholly ignorant. The wise use of science seeks to understand its boundaries in the situation in front of us. We might trust the technical advice on how to build a bridge that will not fall down, but still be concerned about the integrity of the builders and whether they can be trusted to build it according to specification, whether the maintenance contracts will be fulfilled with integrity – something which can all too easily be overlooked when concentrating on capital expenditures

only. We might decide that building the bridge will be good for the local economy, but fail to anticipate some other negative effect from the development it brings, such as opening the area to unwanted types of development and exploitation. In pursuit of wise action one will want to bring other sources of knowledge and advice into play, but each one, like science, will be partial and incomplete. So inevitably, further wise enquiry, tentative and subject to revision, will be called for. It is no longer honest or possible to offer certainty with science without an explicit appreciation of its contextual limitations.

Furthermore, the limited reliability of scientific knowledge is not peculiar to natural science; many current writers point to similar problems with the misplaced authority of neo-classical economics.

Seeing how the institutions of quality-assurance in so many disciplines have proved ineffective, we can invoke the old Latin motto "*Quis custodiet custodes ipsos?*" – who guards the guardians? And then who guards them? Even in the ordinary processes of using science, judgement and wisdom are necessary for the avoidance of pitfalls and disasters. Yet –as we have surveyed here, wisdom itself is now problematic, and no longer 'the answer' in dealing with the tentative suggestions offered by science.

Therefore we make our actions wiser by extending the scope of 'negotiation in good faith', replacing a brittle demonstration by a robust dialogue. This puts science in the 'post normal' (Funtowicz & Ravetz, 1993) context with every other source of knowledge, each to be tested according to its own appropriate quality criteria.

But when all this is done, we will still be faced with the limitation of all knowledge from experience – there is both the risk and opportunity inherent in the incompleteness of our knowledge and the creative possibilities of the future – what Kauffman (2002) called the 'adjacent possible'.

This is why wisdom, in conjunction with science, will always be an essential part of effective knowledge, where knowledge is now a verb and an inquiry, not a noun nor a product.

Part 3

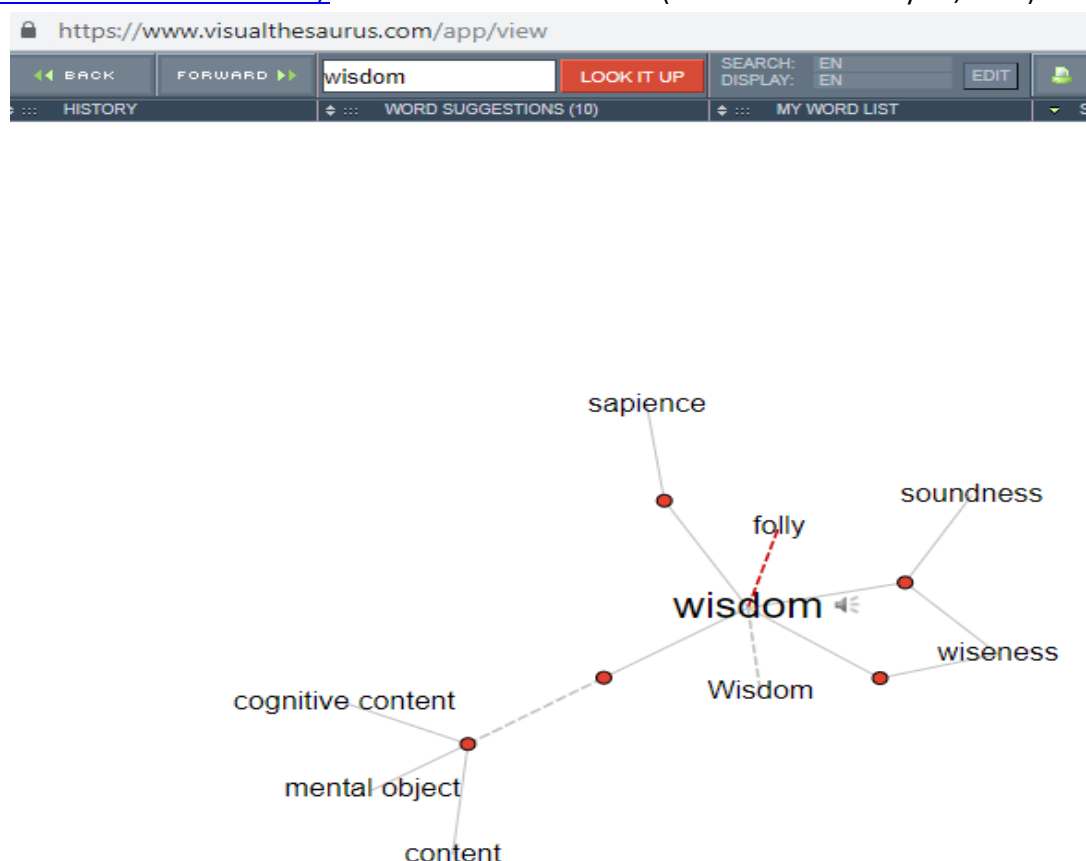
Conclusions

This essay has been a conversation among four people. We started with four distinct ways of exploring the provocative question, what might wisdom become (and need to become); and whether wisdom as we have come to know it has a future?

By now, we can look at this question again, and ask, given that we will need (some form of) 'wisdom' in the future as much as we have in the past, what sort of wisdom might be appropriate for our future?

We found that what we have inherited as 'wisdom' is a distillation of knowledge and –possibly- experience and craftsmanship, in particular areas or in general. Wisdom is linked to 'sense-making', working with knowledge to fill in gaps and intuit what is not known. Wisdom is proven by action, and by decision-making, and only meaningfully assessable from the future. Now when one finds that the stock of knowledge has become too large, too diverse, entailing many levels, and too involved with context and uncertainty, to be

487 easily available, it would seem one needs a special sort of wisdom to access the type of wisdom which one
 488 needs to use this huge knowledge base well. Of course, in the preceding conversations and analyses we
 489 have also associated wisdom with several other concepts to which we think it is useful to relate it. These
 490 include synthesis, humility, awareness of consequences, uncertainty, intuition, and risk and decision taking.
 491 These connotations are a wider set than those offered by the visual thesaurus
 492 <https://www.visualthesaurus.com/> as can be illustrated below (downloaded January 18, 2019).



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495 What sorts of changes in our inherited ideas would be appropriate for achieving this wisdom of the future?

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497 Our conversations suggest that they will involve both form and content.

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499 First, we should reconsider what sorts of questions to ask; and then, in the absence of simple, secure
 500 answers, we should reconsider what sorts of answers to expect. This involves a different type of inquiry
 501 than the 'problem/answer' dialectic which has pervaded much of our scholarship.

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503 As to the questions, we recall that aside from the various sorts of practical wisdom associated with
 504 particular skills, that wisdom was associated with questions of the good life: how to be good, or at least
 505 better than we are. The task was seen primarily as one involving an individual, assumed to have enough
 506 leisure and security to engage on such an enterprise. Now and in the future, when the survival of our way
 507 of life and indeed of our civilisation or even planet are in question, the task of wisdom is correspondingly
 508 more at the societal and extra-societal levels, and also more complex – and more nuanced as we consider
 509 which level, and for whom we are being wise.

510

For a while it seemed that science would develop fast enough and well enough to be able to solve all such problems. But now science itself has become problematic in many ways, requiring wisdom for its own effective and safe deployment. These issues raise questions focused on the nature of wisdom itself, rather than on the classical ones of a personal good.

From what we have learnt of our conversations, we can say that now and into the future, the task of wisdom appears to require the involvement of the wise deployment of knowledge, in the context of its interaction with uncertainty, ignorance, values and quality.

With so many dimensions of the challenge (or is it a system of challenges, with many levels?), simple solutions are in more and more situations almost certain to be futile or counterproductive, with complexity having become an inextricable aspect of the new game.

In designing action, a crucial task now involves the wise creation and use of clarifying descriptors, which are very often expressed as quantities (Espeland & Stevens 1998; 2008; Ravetz, 2008). In their absence, decision making can wallow in a morass of incoherent data; but wise action must be aware also that in the presence of quantities it is all too easy to take the model for the reality, and to solve problems that are chosen for their model-able elegance rather than for their content.

This error has already become widespread in the sciences that deal with complex systems; and this is exacerbated by the fact that it is difficult in many ways for anyone to challenge this state of affairs.

The need for apparently objective, discrete descriptors, to the exclusion of anything explicitly involving wisdom, may appear to be scientific, but if adopted in an unwise fashion can quickly yield nothing but vacuity. Or worse, as Ravetz and Ramirez reported in their essay on 'Feral Futures' (2011).

This aspect, now being highlighted here, of accepted knowledge will also condition the sorts of answers one can expect. Even now, the sciences of action in complex systems are in thrall to the fashion of what can be called Victorian-physics-envy. We are well past the century that started with Einstein's relativity, and proceeded through Heisenberg's uncertainty and Schrödinger's complex-probability and later his notorious dead-and-alive cat. In fundamental physics scientists are lucky if they need to think of only three impossible things before breakfast. Yet the world of action still relies uncritically on a pipe dream of Newtonian physics; this becomes apparent with the extensive use of fallacious statistical reasoning, patently unfalsifiable simulation models, spuriously quantified indicators of quality, and sorcerer's-apprentice algorithms. It is as if we are still in Lord Kelvin's world, when the future of science was seen as merely adding another significant digit to perfectly accurate data.

Of course that picture of hard, precise facts is already under strain. The effects of the fantasy-driven crash of 2008-9 in the economic and political spheres are still very much with us. While the effects in the conceptual sphere naturally take longer to develop they are coming, and one must be prepared for their coming, if one is to manage wisely and survive.

Under post-normal conditions, scientific demonstrations must be supplemented by stakeholder dialogues; ideally seen also from the future perspective, not based only on edifices constructed from past facts and modelled on their distributions. Scenario planning and the courageous and higher quality conversations

they afford (van der Heijden, 1995/2005) is one such way to begin addressing or articulating this requirement

The old criterion of 'truth', however comforting it might have appeared as recently as the recent past, is already giving way to a more realistic and debateable criterion of 'quality'. Rather than wanting facts which simply settle an argument, we want multiple scenarios which help participants in a dialogue to enhance their imaginations and sympathies in order to conjure more radical possible courses of action. In this way we will be able to depart from our present locked-in courses of action which can only poison the environment for future generations.

In our dialogue we have come to hope that people will learn to 'stand in each other's shoes', have difficult conversations about challenging subjects, and learn to disagree well and constructively, as the Archbishop of Canterbury (Brown, 2014) has called for; and to assess current actions from different future perspectives, as scenario planning allows one to do. That will be a path of wisdom by which one can make one's futures, with others.

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