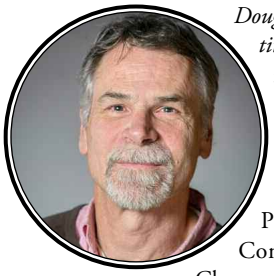
DOUGLAS SCHULER

HOW WE MAY THINK - THE NEXT CHAPTER

CIVIC INTELLIGENCE AND COLLECTIVE METACOGNITION



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HUMANKIND'S CENTURIES LONG MARCH, including its technological achievements and colonization of nature, has brought us to a unique place. The challenges facing us today are complex and interrelated and the potential for sudden, profound, and unexpected outcomes is great. The vast network of interconnected causes and effects worldwide contains numerous tipping points, large and small, and breaching them can result in cascades of unexpected and undesired events, such as food shortages, severe financial perturbations, or social collapse (Tainter, 1990). The approaches that we develop to address or prevent those events – and to recover more readily from the ones that do happen – obviously must be different than the ones that we have used before. We need to understand these particular challenges as best we can and consider how best to meet them, given who we are and what resources we can muster. Significantly, many, if not all of these challenges are the result of human actions. Our psychology, habits, circumstances, institutions, cultures, and our genetic makeup have helped bring us to this historic point: We have met the enemy and it is us as Pogo (a cartoon character) famously declaimed.

While earthquakes historically have been products of earth's tectonic shifts, not something we could attribute to the activities of humans, we now have more evidence of humankind's awesome potential to destroy our own planetary domicile, as they can now be shown to be directly attributable to human activities. Before 2008, there were about two earthquakes per year on the average in the US state of Oklahoma. Now with some new practices of the petroleum industry in which millions of gallons of tainted waste water are injected into the earth, Oklahoma, hundreds of miles from any significant fault line, is now experiencing about two earthquakes every day. (When I looked at the online US Geographical Survey (USGS 2015) map today, May 15, 2015, there had been two earthquakes over 3.0 and another of 2.8 over the last 24 hours.)

Many of the challenges we face are social – ones unleashed or exacerbated by fellow humans – and even the ones that aren't entirely social could be mitigated somewhat through social actions. But even before the recent corporate affront described above, even in the case of earthquakes social factors are significant. Creating settlements in earthquake prone areas, for example, could have been discouraged, and rescue operations after earthquakes could be faster and more efficient. And, of course, natural disasters, even when not exacerbated by additional misbegotten human activity, invariably hit economically disadvantaged people the hardest.

HOW DID WE THINK IN THE PAST ABOUT HOW WE'D THINK IN THE FUTURE?

Right after the end of the Second World War, Vannevar Bush, whose Office of Scientific Research and Development for the United States directed the application of science and technology to warfare,

proposed a provocative alternative to war. His revolutionary article, How We May Think foresaw many of the capabilities – including mass storage of information, environmental sensors, and more precise photography and instrumentation – that we now take for granted in modern information and communication technology. Many of his predictions were provocative and prescient. His hypermedia tool – which he dubbed MEMEX – with its brainlike "association trails" was a mid-century world wide web. MEMEX also was to be a "machine of logic" which would help us apply reason itself more effectively: "We may some day click off arguments on a machine with the same assurance that we now enter sales on a cash register." At the same time he made it clear, however that MEMEX was intended to be a tool to help us think, not a tool to free us from the burden of thinking.

Most of Bush's essay is devoted to discussions of technological marvels that could play some role in a possible future world that was less violent than our current one. While Bush suggests this role for science in reviewing and analyzing humankind's ubiquitous problems he is silent as to how this relatively unprecedented approach might be encouraged or how it might become more effective. Bush seems to see a glimmer of hope but doesn't provide any details.

NOT LEAVING IT TO HOPE ALONE

Now almost precisely six decades later I would like to propose a follow-on chapter that picks up where Bush left off. The "we" in Bush's article doesn't actually address the "we" that must be addressed: how we – collectively – might be able to think together. This capability is actually far more important than the ability to think better individually for two simple reasons. First because everything of any consequence – from warfare to healthcare, desertification to reforestation, oppression to tolerance – is a product of collective thinking and acting. Second because group ignorance can trump group intelligence. This means that if we ignore education we do so at our own peril. Hoarding it, or reserving it for the wealthy, is shortsighted. And education that doesn't encourage people to question the status quo, critically analyze what they hear, learn how to learn, and participate in the creation and recreation of the living world, is not adequate.

This paper walks the thin line between pessimism and optimism because this ultimately seems most honest and most useful. It is not pessimistic or cynical because it allows the possibility of positive change. Neither is it blindly optimistic where the new day is clearly and unmistakably and inexorably dawning. One of the most unpopular aspects of the enterprise suggested in this article may be that everybody is called upon to both think and act. The proposal focuses on a renewable resource – namely intelligence, but not individual intelligence nor some broad-brush, mystical, unknowable collective intelligence, but one based on distributed, shared, reflective, flexible, and cooperative intelligence. It assumes that human engagement could make a substantial difference in how the future unfolds.

CHALLENGES AND RISKS

Compiling a rough list of challenges that humankind faces is relatively easy. Two tendencies vie for the top spot: the struggle not to deplete or despoil our planetary resources so thoroughly that we create an environment that is antithetical to life and the struggle not to kill, enslave, or otherwise exploit vast numbers of our fellow humans. Other challenges, both big and small, could be added easily. The list seems potentially limitless yet most if not all would be related to the two listed above – and to each other.

The short list below contains fresh opportunities for mischief on a grand scale – potential hazards that are more-or-less discontinuous from the basic trajectory of human history. They reveal for the first time that we have the technical means to alter realities and relationships that have been assumed too fundamental and unchanging.

- Monitoring and surveillance on massive scale
- Tightly coupled, hair-trigger financial networks
- Global ecosystem modification and disruption
- Changing the genetic structure of the human progeny through embryo editing
- Genetic manipulation and new life forms
- Intercepting, decoding, and instilling perceptual and other neurological signals (e.g. in video games)
- The rapidity of (mis)information distribution and potential mobilization of large groups
- Remote control of military and police weaponry; semi-autonomous military and police weaponry
- Nuclear, chemical, biological, genetic, and cyber weapons
- Human-like interfaces, including new Barbie dolls that have conversations with their owners

Bush also foresaw some of these technologic advancements. Writing about information transmitted to the brain from the eye, he notes that "we can pick up those vibrations by electrical induction and thus discover and reproduce the scene which is being transmitted, just as a telephone wire may be tapped for its message." This knowledge could presumably be used to help improve vision or, even, to restore sight. On

the other hand, tapping that stream of image information, or, even manipulating it or sending false signals opens new possibilities that, aside from science fiction, have rarely been considered – and only then from a theoretical perspective. Bush acknowledged that he doesn't know where this knowledge will lead, but his advice is apparently to press on: "who would now place bounds on where such a thing may lead?"

Bush seemed to presume that the innovations he predicted would be introduced into a world in which they would necessarily be used for the common good. We know that this is not always true. Many innovations of course are intended to yield private profit (pharmaceutical corporations) while others could be used for warfare, surveillance, or mass incarceration. Bush certainly acknowledged the possibility that wisdom might not prevail but his famous paper did not provide any insights for working towards it.

LIMITS AND TRIGGERS

Several considerations emerge when we characterize our present situation as a system in which all of humankind's activities are interwoven, where an action in one location, directly or indirectly, helps lead to actions in another location that would have seemed unrelated. A drought in one location may help cause civil war; change in lending policies may lead to food shortages and food riots in another; and the need for rare earth minerals for mobile telephones in the developed world could cause banditry and oppression in the developing world. Instabilities can cascade – sometimes very quickly, brutally, and unpredictably.

The structural aspects of our systemic, networked (Helbing 2013) world are admittedly abstract and apparently difficult to influence directly. Their roots in social phenomena, those in which we are directly related, can be readily traced however. Inequality, especially extreme inequality, a product of economic and other types of oppression, seems to be at the root of most of these problems. For one thing, political and economic elites who are the most privileged consume more resources of all kinds than other people further down the ladder. Overconsumption helps create scarcities that can erupt in riots or war, but often "just" contributes to misery and the degradation of potential human capital. Overconsumption also tends to colonize the economic sphere because of the needs (luxuries?) of the privileged crowd out the needs (often real) of the less privileged. Often the effects of this – and the effects of deprivation generally – are invisible to the overconsumers. Finally, they are largely responsible for the rules of the games – economic policies, political representation, definition and enforcement of what is criminal, access and influence over mass media, etc. etc. – as well as the dominant ideologies of the time: What is legitimate thought? How should society be governed? What should the roles of "ordinary" people be? What are the risks and responsibilities?

> Risk is function of the likelihood of some negative occurrence taking place and the magnitude of the negative consequences that would result from the occurrence. Unfortunately, it is often nearly impossible to assign precise values to either of these – especially the new opportunities for regrettable consequences with which we have had little experience. Then, of course, there is the very difficult issue of determining what could or should be done in relation to the risk and, generally even harder still, figuring out how to do what has been determined to be prudent and to do it.

To address – and anticipate – the risks and opportunities that confront us today, we must inquire into the cognitive and, especially, the metacognitive ensemble that we can draw on. This is Bush's How we may think question again. For how we may think begets how we may act. The deep and vaguely understood relationships between our thoughts and our actions, the risks and opportunities, and the uncertainty and unknowability of the future place humankind at critical transition point. Where this swings and what new paradigms emerge are likely to be at least partially driven by the civic intelligence, discussed below, that we can develop in the short-term.

VARIETIES OF COGNITION AND INTELLIGENCE

To consider how fit we are collectively to address the challenges we face, we need to look directly at our ways of thinking. In any task one faces it is prudent to consider whether the resources (skills, tools, time, knowledge, etc.) will be sufficient. The intelligence distributed among the human population is arguably our most important resource. Will we be able to apply this resource successfully to the battery of challenges we will face in the coming years?

INTELLIGENCE

Cognition is a complex process and very little is visible for inspection. Cognition in an individual is an amalgam of many processes including perception, interpretation, decision-making, learning, emotional reactions, values assessing, planning, etc. It is not a matter of purely rational thought (or a hypothetical entity, rarely observed outside of academic journals) and it surely cannot be gauged accurately in its entirety by a single number. It is likely to be composed of many

semi-independent networks which are engaged during all of our waking (as well as our non-waking) moments. We need/use it when we go about routine activities and when we are confronted with unprecedented events as well.

Intelligence can be seen an assessment as to how well somebody performed on a specific test or challenge. Also, presumably it would describe how well they would perform in the future – or, even, on other tasks. I use a more holistic view of intelligence – one that factors in all of the elements that go into our thoughts and actions, more like intelligence in the wild, as it exists in the real world. Clearly, the ordinary and extraordinary challenges we face in our lives won't be solved using only logic or math, or solely by using an impressive vocabulary. And they won't take place in a psychologist's laboratory. Intelligence means efficiently and effectively addressing a variety of tasks that we are often faced with. It also means adjusting one's approach when necessary, generally when it fails or otherwise seems inadequate.

METACOGNITION

Metacognition is a fairly unfamiliar concept. In a nutshell, metacognition is "thinking about our thinking" and it describes the ability to improve how individuals think. Metacognition includes "people's abilities to predict their performances on various tasks" and their ability to "monitor their current levels of mastery and understanding" (Bransford, 2000). Importantly, metacognition takes place both consciously and subconsciously. This implies that we can sometimes make changes in our thinking without our knowledge of doing so.

Further, metacognition is a key feature that separates experts from non-experts. Metacognition allows experts to improve their understanding of some area by improving the methodologies they use to think about it. And new methodologies can result in deeper models of the content of their study, whether it is geology or human behavior. Metacognition also can help us develop educational approaches "that focus on sense-making, self-assessment, and reflection on what worked and what needs improving" (Bransford, 2000).

COLLECTIVE INTELLIGENCE

Collective intelligence broadly characterizes how well collectivities work together to address challenges. These challenges can range from simple problems with known answers (such as identifying the capitals of all the countries in Europe) to thoroughly vexing problems (such as lessening the extent or limiting the damages of climate change). The form that collective intelligence takes (similarly with intelligence in individuals) depends on the context – the nature of the collectivity involved, the circumstances, and the challenges being faced.

As Roy Pea (1993) observes, "Anyone who has closely observed the practices of cognition is struck with the fact that the "mind" never works alone. The intelligences revealed through these practices are distributed across minds, persons, and the symbolic and physical environments, both natural and artificial." In fact it is not clear exactly where intelligence is located. Many times it is easier to retrieve information from the web even if the same information exists somewhere within our own brain. Is the search engine part of our brain? Rai (2013) points out that "Living in social groups greatly enhances the cognitive capacity of a given individual because we can rely on others for both additional memory and information processing." And although Wegner (1987) labelled the sharing of memory duties of romantic couples as "transactive memory" it is clearly an important feature whether we are presently involved in that situation or not.

The base of knowledge that we rely on to a large degree is built on information that has been accumulated from people and cultures spanning the centuries. Through the miracle of language the whole of humankind, including those living, dead, or not yet born, is drawn into the collective web of thought, historically through writing and the written records that survive, but also through paintings, music, architecture. The media that humankind currently produces is more diverse than those of previous centuries and it will be available to our successors. The extended mind hypothesis (Clark and Chalmers 1998) presents the case that "mind" is not just what is in your head: it doesn't stop at the border between your body and the environment. A person, for example, can store information in their own memory, on a slip of paper, on their telephone, or even, just be knowledgeable about how to locate that information on the Internet via search engines. Each of these approaches could be seen as memory.

The study of collective intelligence has recently focused on small groups, in particular to develop more creative and effective work teams. Anita Woolley and her colleagues (2010) have done important work in this area, testing many small groups on a variety of tasks. One of their findings, presumably applicable in other settings, is that collective intelligence is not necessarily determined by the IQs of individual participants: the intelligence of a group is often higher than that of the most intelligent participant. For example turn-taking in a meeting or conversation turns out to be an important part of collective problem-solving, as well as the number of women participating (Woolley et al, 2010). The secret recipe however is not simply to include as many

women as possible in every team or to adopt mandatory turn-taking, but rather to realize that how the collectivity works together is the ultimate goal and that diversity, respect, turn-taking, and other such features are all very important.

Currently, no doubt stemming from the new possibilities enabled by networked digital technology, there is a big focus on collective intelligence. Much of this revolves around "harvesting" and other techniques where individuals are reduced (in my opinion at least) to "neurons" performing snippets of thinking, and who, along with many other people are providing a neuronal service, serving people elsewhere for other purposes. I would argue that this type of collective intelligence contains to some degree the whiff of exploitation. It certainly advocates a narrow use of human beings – which is, admittedly, not without precedent. Collective intelligence, as it is generally portrayed, does not have an explicit focus on usefulness or norms. It could be argued for example that war can be characterized as two (or more) competing collectivities both employing collective intelligence – albeit of a non-collaborative and counter productive variety. Unfortunately, collective intelligence has conceived and conducted wars, witch hunts, genocides, pogroms, mob actions, and other barbarisms – sometimes most brilliantly. It has helped establish – and maintain – vast systems of social and environmental dominance. These are habits of collective intelligence that we would like to unlearn.

COLLECTIVE METACOGNITION

Collective metacognition is to collective intelligence what metacognition is to individual intelligence. Basically it describes how collective intelligence can be used to think about its own collective intelligence with an eye towards understanding it, and, hopefully, improving it. However abstract it may first appear, understanding how other groups of people "think" and how societies work is of utmost importance to attempt to "fix" things. After all, this thinking (however unconscious it might appear) has helped us devise complex societies and incredible technologies. Probably the most significant of them is language, which enables us to convey complex ideas and information that cannot be readily communicated via facial expressions, vocalizations, and body movements, and which links us together and helps us think and act cooperatively. There are currently a variety of institutions such as businesses, schools, and foundations that practice collective metacognition but they generally lack the broad societal focus. Also, in many societies, this type of perspective is explicitly or implicitly discouraged: for one thing, it assumes that the society is not perfect.

CIVIC INTELLIGENCE

Civic intelligence is the capacity of a group of any size (including a single person – the smallest possible "group") to address shared challenges effectively and equitably. It can be described as the ability to address civic ends through civic means. It is intended to pick up where collective intelligence and collective metacognition leave off. For one thing, civic intelligence is normative, it is something that we strive for, not just something to observe. The idea of civic intelligence is used descriptively, diagnostically, and aspirationally. We assume that civic intelligence is something that changes naturally over time, waning and waxing depending on a variety of factors. We further assume, however, that by acknowledging that such a thing exists, we can evaluate our current and historic measures of it and, most significantly, take measures to improve it.

Civic intelligence tends to focus on civil society, communities, non-profits and the like. This is not because the role of economic and other elites is not necessary. If anything, their tasks should actually intensify with a stronger focus on civic intelligence. The focus on the people who have been left out is important for several reasons. The first is because their massive numbers represents a vast resource – of energy, time, intelligence, creativity, etc. And these numbers also suggests that they hold a sort of veto power whether they know it or not. The other reason is that the elites are not necessarily able – or willing – to employ civic intelligence, since civic intelligence is inclusive and is intended to benefit everybody.

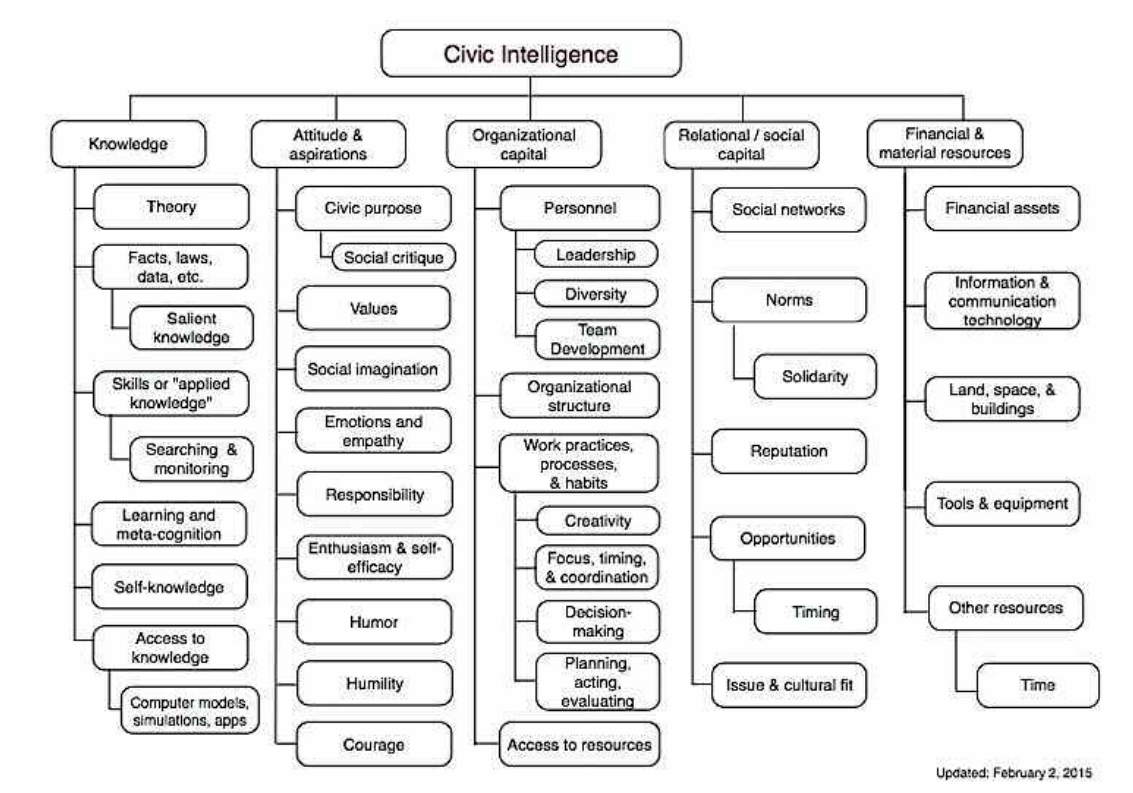
Civic intelligence cannot be reduced to numbers – nor should it. This, of course, doesn't mean that it is impermeable to analysis. One approach is to look for attributes that bolster civic intelligence. The first draft of a framework for civic intelligence capabilities is presented in the figure below (discussed in more details in Schuler 2014). The objective was to identify and synthesize a wide range – including most if not all – of the critical capabilities of civic intelligence from a variety of sources including social innovation, social change, organizational behaviour, social psychology, and many other disciplines. There are five main categories of capabilities, represented in the columns below, all necessary for a collectivity to develop and deploy civic intelligence in pursuit of the common good. The first column shows a number of approaches to Knowledge, most of which are not addressed in formal education. The second column, Attitudes and Aspirations, presents a variety of critical features such as Social Imagination, Self-efficacy and Civic Purpose, which are, again, not generally part of a formal education. The next two columns contain features of Organizational Capital

and Social Capital respectively, acknowledging the importance of being organized (with people, processes, etc) and of social relationships. The fifth column lists Financial and Material Resources, which are needed, but often in short supply for activists and others who may be working for social change.

CIVIC IGNORANCE

Ignorance exists in many forms. One is the simple lack of knowledge, which is the only non-active form of ignorance. The others require some type of active processing (including filtering). Not knowing is an unshakable aspect of life: we don't know exactly what the future will bring. Ignorance becomes civic ignorance when the ignorance takes a social direction by not lodging solely in the minds of individuals. One of the ways in which ignorance becomes dangerous is when people (or groups of individuals) don't believe that they are ignorant – but know that others are. Ironically, it is the denial of ignorance that demonstrates civic ignorance most clearly. Moreover, because civic intelligence is contextual, ignoring or denying environmental degradation and other factors that threaten our survival suggests that civic ignorance is being deployed. As Dewey (2007) points out, "we always live at the time we live and not at some other time."

> We need to look at civic ignorance for several important reasons, in particular because it has not received the attention it deserves. People have the impression that "if the facts were known" people would accept them right away. This naive belief causes us to not notice a vast force that permeates our lives. Yes, ignorance of ignorance makes ignorance. It is probably useful to consider it as a variety of cognition, and acknowledge that the cognitive processes of civic ignorance are working against our collective survival and our ability to work together for the common good.



Framework for Civic Intelligence Capabilities.

Although public manipulation is probably as old as our species, the invention of the public relations industry was probably a big step in the development of professional propagation of ignorance. The cigarette industry's fight against public health in the United States represents one of the best examples from which to learn. One of the tactics employed, which helped keep premature death rates high, was to sow doubt in the public: Because, the story went, science had not proved a link to cancer and other debilitating diseases, there was no need to regulate tobacco use. Other entrenched interests have taken other paths toward civic ignorance. In the US the

National Rifle Association (NRA) lobbied congress to pass legislation that specifically forbade the Center for Disease Control for studying gun violence as a public health issue. And the US state of Wyoming recently passed legislation criminalizing various acts of recording environmental conditions, via photography or testing creek water for biological and industrial contaminants.

The challenge of increasing our civic intelligence is made ever more persistent – and daunting – when witnessing determined, irrational, self-inflicted cascades of ignorance that arise periodically with little to no external provocation. Recently (i.e., still going on as of May 2015 when this was written) a group of conservatives in Texas and other Southeastern states have convinced themselves that under the guise of Operation Jade Helm, a routine military training exercise, the US military under the command of President Barack Obama is planning to "confiscate firearms, impose martial law, or even forcibly relocate citizens to FEMA internment camps." The situation stretched beyond merely marginal eccentricity when Texas Governor Abbott ordered the Texas National Guard to monitor the situation.

There are several themes that purveyors of civic ignorance use and, unfortunately for the rest of us, they often can find ready audiences. These include claiming that they – or a book or document – alone provides access to the literal truth, naming one or more specific groups as villains, or appealing to people to return to some bygone golden era. And while purveyors of civic ignorance are culpable, they would have little success without people who are receptive to their messages. This suggests a need for teaching more critical thinking and media literacy in the schools.

Rai (2013) also introduces some very relevant ideas for the exploration of civic ignorance: "Perhaps more intriguing than the cognitive consequences of participating in a social group are the cognitive consequences of being cut off from the group." Also, citing the work of Bertrand, Mullainathan, and Shafir (2004), Rai mentions that people of low-sociological status lack the access to the "extensive environmental and interpersonal supports" that people of higher socioeconomic status enjoy. He goes on to say that because of this, "living poor in America is akin to a chronic state of thinking under divided attention, a condition known to severely impair cognitive processing (Bertrand, Mullainathan, & Shafir, 2004).

ARENAS AND PROJECTS

Here we discuss briefly a few broad areas such as education or the media that seem to be most central to the expression and cultivation of civic intelligence. These areas although they are discussed separately are strongly related to each other. For example, ways of thinking about media and interpreting its messages and effects – the field of media literacy – is an important topic for education while, at the same time, the media has vast potential, largely unrealized, for educational initiatives, literacy, and a focus on public affairs. In general these areas present both challenges and opportunities for civic intelligence. We can also look at specific circumstances and see how they affect capabilities from the civic intelligence framework. If, for example, we noticed that media – television, perhaps – helped degrade some of the capabilities, we could attempt to make up for that deficit.

MEDIA

We are all connected to each other. The fact, however, that we are all part of a gigantic web of ideas, discussion, declarations, should not be mistaken as evidence that we are all in this equally. Large corporations (and, often, national governments) are the primary gatekeepers of the media, be it broadcast, film, print, or online. They control a large percentage of what people see and hear and use as points of reference in their thoughts and conversations with others. According to research that is now several decades old, these institutions do not control what we think – only what we think about – itself a substantial challenge. Existing within an immense media dominated world presents daunting challenges for civic intelligence: ignoring it is impossible – and would not be useful. Using the tools that are available to us is reasonable but critiquing the existing systems and developing our own independent approaches and supporting existing ones are necessary as well.

GOVERNANCE

How can we go about changing a vast system, solidly established and instrumental in the maintenance of institutions that are sometimes helping to cause our problems and often not being successful in solving them? Attempting to answer this by suggesting that they be simply replaced begs at least two questions: (1) How could this replacement come to pass? and (2) What confidence do we have that their replacement would be any better than the original? Currently there is worldwide mistrust of government, yet many of the alternatives suggested are not ready for prime time. We can rail against these institutions but in all likelihood we will have to play a role in their transformation. Exposing corruption and promoting more transparent processes are both important. At the same time however many authors are noting that government-citizen partnerships are now in place and yielding good results (See Briggs 2008 for several interesting examples). Renegotiating the relationship between citizens and their governments seems obvious and timely.

EDUCATION

Education for civic intelligence takes different forms than those offered by formal education around the world. Using the capabilities framework to assess educational institutions and programs can show how much work we have before us. Education that turns students into assembly line objects to be filled with knowledge and then graded and tested continually diminishes the prospects for civic intelligence. Fostering autonomy and problem-solving skills are essential. Encouraging students to pose questions (Bruce & Bishop, 2008) in relation to the existing systems including the messages they produce and the assumptions that are not visible is perhaps the most important lesson – and the hardest to unlearn. The desire of students to learn and that of teachers to teach are hard, but not impossible, to extinguish. We need to find or create the spaces in which educational practices that encourage civic intelligence can flourish.

INFORMATION AND COMMUNICATION SYSTEMS

Just twenty-five years ago, most people had never even heard of the Internet. In the early days of the Internet commercial activity was prohibited. Now, however, a few corporate behemoths, Google at the pinnacle, are the de facto rulers of the Internet. The public libraries, now probably seen as somewhat quaint, were guardians of public knowledge. They used the public Dewey Decimal System approach to catalogue their holdings. Now Google continuously sweeps the public Internet to enrich their repository of information but shares their bounty parsimoniously, one search at a time – and never in an automated fashion similar to the way that they conduct their business. But what would a public search engine look like? It would presumably not sell advertising space. The system could be massively distributed around the world and would not require gigantic server farms. Could there also be a public Facebook that was extensible by other groups besides Facebook? And could collaborative and deliberative approaches (De Cindio, 2012) be built into these systems? Can we envision new early social warning systems that help us understand how oppression and poverty play out in the real world? And what is stopping us from building these tools?

NEW COLLECTIVITIES

It is an article of the democratic faith that the more people are knowledgeable (and willing to become more knowledgeable), willing to listen to others, concerned about short and long-term challenges, and engaged in the pursuit of the common good, the better the chance of achieving social progress. But while the numbers of individuals who meet these criteria is important, the ability for them to think and act together is of far greater significance. One of the most pressing needs – which is one that the Internet and new information and communication systems are likely to help meet – is the need for new collectivities. We are beginning to understand some of the characteristics of these new collectivities although we are essentially entering uncharted territory. And because some of the many opportunities may not remain available forever we need to be moving quickly.

Business and government are organized around common interests but civil society seems to be lagging behind. The structural asymmetries are staggering. They include inequalities around economic opportunities, knowledge, surveillance, language, mobility, climate change and environmental degradation, access to communication and information, skills, and access to power and decision-making. We need to use a big tent approach perhaps modelled after the World Social Forums, perhaps online or both, in which these concerns can be discussed. We also need to explore various methods of working together via indirect coordination that are flexible but promote cooperation on shared goals.

We believe that the new collectivities should generally be both inclusive and diverse. According to Stokol, drawing from a variety of studies, "Cross-disciplinary teams have become increasingly prevalent across many research domains, owing to the growing recognition in academia and society at large that the world's most complex and intractable problems – including global climate change, poverty, war, famine, and disease – can be better understood and ameliorated from a broad interdisciplinary perspective than from the narrower vantage points of separate fields." Although these new collaborations are not trivial to institute or sustain, they are vital. It will be important to work directly with artists, educators, designers, community health workers, social workers, business owners, scientists, media outlets, technologists, activists, and with marginalized communities, to join established collectivities and build / invent new ones.

HOW MIGHT WE THINK NEXT?

The type of social progress we need will not be provided by a new app. The strongest determinant for civic intelligence today is the degree to which it is actively cultivated and practiced by people around the world. We have seen on the framework that social critique and

the belief in positive social change are both necessary. In addition to this, the social imagination to envision a better future is also necessary. Civic intelligence attempts to point the way towards changing the system before it is too late. It attempts to make a practical case for utopian ends. What would a general rise in civic intelligence look like? The successful demonstration of civic intelligence might manifest via fewer acts of violence and less denial of the legitimate plight of other people. There would be more empathetic engagement by people of greater means. We would need to see progress towards social and environmental amelioration.

Ultimately the intent of this article is to make a strong case for intelligence – individual, collective, and civic. The vision of intelligence presented here is expansive and protean – it can and should take different forms with different people in different situations. The book that I developed with contributions from over eighty other authors (Schuler 2008) contains 136 patterns that describe concepts, actions, and projects that can be used by people interested in civic intelligence. Each of the patterns is intended as a seed that can be used to help inspire and inform civic intelligence enterprises. While each pattern has potential relevance, Civic Intelligence, Open Research and Action Networks, Teaching to Transgress, Strategic Capacity, Social Dominance Attenuation, Community Inquiry, Mirror Institutions, Tactical Media, Open Source Everything, and Experimental School are likely to be especially pertinent to this discussion.

Civic intelligence means thinking, and thinking about thinking. It implies action as well. We cannot wait until we know everything before we act because we cannot wait forever. This essay explores the concept of social metacognition, particularly in relation to civic intelligence. Although neither of these concepts is in wide currency, both, by virtue of the intellectual and other efforts they help engender, could prove useful as humankind struggles with the challenges of the 21st century.

I suspect that Vannevar Bush erred to some degree by seemingly putting too much faith in technology. Regardless, I do believe that too much faith is currently placed in technology. Technology is relevant since it is likely an element of potential solutions. It is also obviously part of the problems that we now face. But it cannot do the work that only people are capable of doing. Bush's article As We Might Think did raise some extremely important questions. I suspect (and hope) that he would agree with many of the points made here. The question of how we might think next is the critical one for us. Times have changed and the way we think about how we think needs to be changed as well. The authoritative story of civic intelligence is currently being written.

> While what we call intelligence may be distributed in unequal amounts, it is in the democratic faith that is sufficiently general so that each individual has something to contribute, and the value of each contribution can be assessed only as it entered into the final pooled intelligence constituted by the contributions of all. (Dewey 1939).

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The U.S. Army Special Operations Command (USASOC) maintains there is nothing menacing about Jade Helm. <http://bit.ly/1IYVMiS> [Retrieved 15 May 2015].