ISSN 2291-5079
Volume 7 / Issue 1 + 2 2019

COSMOS +TAXIS

Studies in Emergent Order and Organization

Symposium on Roger Koppl's *Expert Failure*

COSMOS + TAXIS

Studies in Emergent Order and Organization
VOLUME 7 / ISSUE 1 + 2 2019

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Preface to a Symposium on Roger Koppl's *Expert Failure*

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Roger Koppl's *Expert Failure* is an important book that merits serious consideration for social scientists, policymakers, and the interested public. To that end, and with the support of *Cosmos + Taxis,* I invited contributors to submit original papers "critically assessing the book and its significance." Also, the Symposium includes a comment on the papers by Koppl.

Expert Failure defines experts as those who are *paid* for their expert opinions. Such experts ordinarily lay claim to experts' opinion that people find useful and therefore are willing to pay for the expert's opinion. Physicians, engineers, and financial advisors, sell expert opinions; for the most part these exchanges are routine and conducted under generally competitive market transactions. If a market transaction based on an expert's opinion is wrong, the cost in internalized to the buyer. A difference arises, however, if experts have power as government policy makers: if a government policy made by experts is wrong, that mistake will be externalized among many people in the form wasted taxes and the possible harm to many people.

Even before *Expert Failure*, Koppl's work from years ago connects to the present discussion. For example, in Koppl and the late Leland Yeager's (1996) theory of Big Players explains why discretionary monetary policymakers bring disorder to the market because they cannot escape their epistemic constraints. Soon to follow were Koppl's *Big Players* and *the Economic Theory of Expectations* (2002), and *From Crisis to Confidence: Macroeconomics of the Crash (2014)*, including a swath of articles that elevated epistemic concerns for understanding forensics[1] and the market process. *Expert Failure*, combining epistemics, incentives, and information theory, is a major step for analyzing the implications of different institutional settings in which experts operate, especially as policy makers.

The considerable interest and excitement of *Expert Failure* has brought together an invited group of scholars from economics, political science, sociology, and philosophy. With such eminent contributors, the papers are presented alphabetically with one exception: Gazarelli and Infantino's essay seemed fitting as the lead-off paper of the Symposium. Hopefully, this Symposium induces others to seriously consider Koppl's work and its applications, including for example, climate change policy and its effect on the scientific order, the Administrative State, and many other inquiries concerning the epistemics of social orders, both spontaneous and designed. The essays herein demonstrate the fertility of *Expert Failure* from a variety of perspectives and subject areas that discuss, extend, and illustrate the broad field of burgeoning scholarship that Koppl's work informs. But more than just a fascinating academic treatise, Koppl's analysis is also relevant because his academic work speaks to issues that affect individuals and, of course, civil society as well.

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An Introduction to *Expert Failure:* Lessons in Socioeconomic Epistemics from a Deeply Embedded Method of Analysis

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I.

Expert Failure by Roger Koppl (2018) is a compelling economic analysis of the demand and supply forces governing and disciplining the knowledge market of expert opinion, especially the one influencing the public sector broadly defined and public policy. Koppl suggests that these forces are not sufficiently freely competitive: there are too many barriers to entry, too many monopolistic distortions, and too many taken-for-granted, wrong-headed perceptions. This situation leads to deadweight losses. Ergo, barriers to entry must be broken down, monopolistic distortions eliminated, and perceptions rectified. To do so, the market for expert opinion must be rendered more freely competitive.

What lies conceptually behind Koppl's wake-up call? How does he put forth his case? What are the building blocks of his conclusions? What are the pillars of his normative prescriptions?

Koppl's economic analysis is primarily cognitive. At its core, the book can be seen as an attempt to extend the Hayekian limited cognition problem from knowledge dispersion (Hayek 1937, 1945)—and, by implication, the related Smithian division of labor theory (Smith 1776)—in terms of field of application as well as in terms of sophistication; where the nexus between Smith and Hayek, Koppl often reminds us, is the work of Bernard de Mandeville, especially his *Fable of the Bees*. In Koppl's approach, division of knowledge and division of labor co-evolve without central design—invisibly, in an unintentional fashion. The consequence is that *Expert Failure* is a treatise in *socioeconomic epistemics*.

The bulk of what follows is dedicated to a summary of the content of *Expert Failure* against the backdrop of the method of analysis employed. Indeed, it is the uniqueness of the proposed method that allows Koppl to seamlessly weave together broad insights from classical and Austrian economics, comparative institutional analysis, and Public Choice into what he dubs "information choice theory." Our claim therefore is that to fully appreciate what *Expert Failure* achieves it is important to clearly understand its method, which we shall refer to as *deeply embedded*. Ultimately, our stance is more constructive than critical: we mainly point to some of the ways in which the arguments of *Expert Failure* could be extended through links to some complementary methodological ideas. Our extension allows us to conclude on a more optimistic normative note than Koppl.

II.

Those familiar with Koppl's work will soon realize how this book generalizes in several fundamental directions his earlier work about the economics of forensic science (Koppl 2005), and relates explicitly even to his earlier research program on so-called Big Players (Koppl 2002). But now the canvas is much larger, and the analytics rely on a lens with a much wider angle.

Expert Failure draws on a variety of sources and disciplines: economics, most obviously; but also forensic, organization and policy science, philosophy, sociology, and others. For example, early on we learn that the proposed theory of experts is "on all fours with the theories of philosophers such as Mannheim (1985) and Foucault (1980), science and technology scholars such as Turner (2001) and Collins and Evans (2002), and sociologists such as Berger and Luckmann (1966) and Merton (1976)" (Koppl 2018, p. 8). *Expert Failure* moreover contains helpful disquisitions on ancient Greek philosophy and on Scottish moral philosophy; on classical economics and on division of labor; on spontaneous order and evolution; on information theory and on phe-

nomenology; on power and influence; and on the importance of context for decision- and policy-making.

Koppl hammers down as hard as possible the point that experts are people too. As such, expert opinion can be flawed, behaviorally as well as motivationally. Behaviorally, we all suffer from cognitive limitations. Motivationally, we all respond to incentives, even if the response could be expedient. Thus, an expert is not different from the next person. An expert is fallible. Given human fallibility, expert opinion, like everyone else's, must be taken with a grain of salt. Experts fail for *both* knowledge and incentive problems; maybe more interesting, they can fail for knowledge problems even when incentives are properly aligned.

This simple inescapable realization residually implies that we need not forget the institutional environment—the rules of the game—within which individuals operate. If knowledge were perfect and incentives always aligned, then there would be no need for institutions. But institutions are there to aid our purposive action. Institutions must be studied in conjunction with human action—they cannot be meaningfully separated. Equally important, institutions, like people, are imperfect. So, no matter what, the net of it is that the best we can hope for is a second-best world.

III.

Let us start from the unit of analysis—the expert. There have been many definitions over the years about what constitutes an expert. One often-employed definition is that an expert is any individual with expertise. But, analytically, this is not a sufficiently tight definition. For, given the natural division of labor and of knowledge, it includes everyone: we are all experts in something according to this definition. Reasoning according to the "economic point of view" (Kirzner 1976) offers an analytically tighter definition, which is often repeated in *Expert Failure*: an *expert is anyone who is paid for their opinion*. To put it differently, what sets the expert apart from the nonexpert (variously layperson, layman or laity) is that the expert receives remuneration for an informed guess whereas the nonexpert does not.

This tighter definition naturally leads to the knowledge problem. Hayek's insights about knowledge dispersion are applied to a narrower domain: the expert opinion market instead of *the market*. More importantly, Hayek's insights are expanded.

Austrian, evolutionary and institutional economists, theorists of the firm, and management and technology policy scholars in particular are aware that knowledge comes in many varieties—codified, explicit, general, specific, sticky, etc. More specifically for Koppl's (2018, p. 120) information choice theory, knowledge is "SELECT, which represents the idea that knowledge may be Synecological, EvoLutionary, Exosomatic, Constitutive, and Tacit." Consider Koppl's knowledge varieties in reverse order.

The notion of tacit knowledge has deep roots. It is found in the work of Michael Polanyi (1958), and saw an explosion of interest, roughly from the 1980s, thanks to work on the theory of the firm (Richardson 1972). We have in mind especially the related research programs dealing with routines (Nelson and Winter 1982), capabilities (Teece, Pisano and Shuen 1997) and competences (Dosi and Marengo 1995) (which nowadays all seem to have reached a plateau in terms of research interest, and unfortunately have also penetrated little in so-called mainstream economics). Polanyi's oft-cited illustration of tacit knowledge refers to the inability of Hungarians to get a light-bulb machine to work, although the machine was identical to one that functioned perfectly well in Germany. The lesson being that not all knowledge can be represented by a set of blueprints: knowledge can be difficult to articulate and transmit.

Constitutive knowledge forms part of the phenomenon to be explained. It "guides action. It need not exist prior to or separately from the actions so guided. I did not know how to ride a bicycle prior to the action and my bicycle know-how is not independent of my bicycle riding. … Expertise is generally constitutive knowledge derived from the expert's place in the social division of labor" (Koppl 2018, p. 124). Though there can be overlap, constitutive knowledge is contrasted to speculative knowledge, which instead tries to explain social and natural phenomena. "Sailors had a *constitutive* knowledge of their craft long before scientists acquired a *speculative* knowledge of the mathematical principles of sailing" (Koppl 2018, p. 123, original emphasis).

Exosomatic knowledge relates to Popper's (1978) well-known "Three Worlds" categorization, and especially "world 3," where we find books and other fruits of human creativity (art, language, legends, mathematics, music, etc.), including feats of engineering (airplanes, airports, automobiles, ships, trains, etc.), that contain knowledge outside the human mind. "Knowledge is exosomatic if it is embodied in objects existing outside the organism that uses such knowledge" (Koppl 2018, p. 121). A good illustration for the theory of experts "might be an egg timer. The knowledge of when to remove the egg from the boiling pot is embodied in the egg timer, which exists apart from the cook" (Koppl 2018, p. 122).

The evolutionary element of Koppl's SELECT knowledge is arguably the easiest to intuit. The principles of evolution—variation, selection and retention—apply to knowledge too. Knowledge expands through an ateleological process of trial and error. The process leads to variations in knowledge, where the relatively better variations are selected from the relatively worse and retained. What is at play is basically the familiar logic of evolutionary epistemology found in Lakatos, Popper and others, but applied to a context different from methodology of science.

SELECT's synecological element is arguably the most fundamental epistemic pillar upon which *Expert Failure* rests. It is an adjective deriving from the ecological notion of synecology (etymologically: same ecology), which is the "study of the relationships between the environment and a community of organisms occupying it," and can also refer to "the relationships themselves." In Koppl's theory synecological knowledge translates into the idea that "such knowledge is generated by the interactions of elements in" the same environment (or ecology), "and is not separable from these elements, their interactions, or their environment" (Koppl 2018, p. 121). The classic *I, Pencil* parable remains one of the simplest illustrations to grasp synecology. The knowledge about how to make a pencil does not rest entirely with one individual. It is held, in a fragmented fashion, by a set of interacting individuals all contributing to the same objective (pencil-making) given their own unique knowhow (Koppl 2018, pp. 120-1).

Koppl derives two intriguing implications for a theory of experts that assumes SELECT knowledge. The first refers to "synecological redundancy" (Koppl 2018, p. 184), viz. the notion that a social system (e.g., community, state, firm) should have heterogeneous elements that perform the same function. If this redundancy property is satisfied, then the system will improve its chances of survival in the face of change. This notion is well known to students of polycentric systems, such as Hayek, Vincent Ostrom, Polanyi, and their scholars. The idea is that if we have different elements performing the same functions, then the system will persist even if an element breaks down. Think of the differently colored light bulbs decorating a Christmas tree that keep working even if one or more burn out. Or think about "Linus's Law" (after Linus Torvalds, creator of the first Linux kernel) in the production of Open and Free Software (Garzarelli and Fontanella 2011); that is to say that "given enough eyeballs, all bugs are shallow" (Raymond 2001, p. 8).

The second implication concerns "synecological bias, which is the bias arising from synecologically bounded rationality. The division of knowledge makes it impossible for anyone to avoid a limited and partial perspective, which implies a kind of parochial bias in our perceptions and judgments. Only multiplying the number of experts and putting them in a position of genuine rivalry can mitigate this important form of bias" (Koppl 2018, p. 199).

In other words, expert competition from synecological redundancy can help mitigate synecological bias. To extend the ecological parallel, the competition within a system benefiting from synecological redundancy can lead to knowledge growth from the various ecotones that exist among the competing experts. In ecology, an ecotone is an area of transition, a space where there is tension (*tonos*) between environments (*oikos*). In social systems we may consider an ecotone as that interstice (Lachmann 1971; Foss and Garzarelli 2007) where the frequency of synecological redundancy is highest. A social ecotone is a space where there are *both* idiosyncratic bits of knowledge and shared bits of knowledge that interact in nontrivial ways from active rivalry, and lead to SELECT's knowledge evolution. One can find concrete social illustrations of ecotonal competition in economic and political sociology as well as in economic history (Baechler 1975; Tilly 1985; Jones 2003).

More generally, synecological bias suggests that even if all incentives are properly aligned, there could still be errors in expert opinion in light of limited cognition and context (i.e., synecologically bounded rationality). There thus could be errors in decision making as well: individuals can still make errors when the institutional environment manages to align incentives, i.e. errors can be made in good faith. We may conceive of synecological bias as the *parallax error of social systems*.

Synecological bias is what mostly distinguishes information choice theory from Public Choice. There are few contributions that attempt to explicitly bridge Austrian knowledge dispersion insights with Public Choice's emphasis on the problem of incentive alignment in the public sector (e.g., Wagner 1993; Garzarelli and Holian 2014), and one can reasonably argue that *Expert Failure* is so far the most sophisticated and promising.

IV.

So at the core of information choice theory is the idea that variegated knowledge lives divided within an environment and is harnessed as needed, according to objective to be pursued. At the methodological level this means that in social science it is not possible to isolate individual from circumstance. We can say that in any social relationship a "third character" comes into play, namely the context made up of individuals and rules. This third character can never be avoided—it is always present in social interactions (Ortega y Gasset 1932, p. 540).

The sociological counterpart to this methodological stance is to say that human action is embedded (Hirschman 1982; Garzarelli and Thomassen 2006). This is meant not in the naïve sense that the individual disappears overshadowed by volitional wholes; rather, the idea is that individual interaction can be also coordinated by repeated social interaction (Granovetter 1985). Repeated interaction in turn leads to emergent properties, such as division of labor and of knowledge, and spontaneous orders. The "productivity of social cooperation surpasses in every respect the sum total of the production of isolated individuals," wrote Mises (2013[1933], p. 39) in a related context. The whole still has no will. But at times it also can be not just the sum of the parts.

Epistemically, Koppl's preferred battle horse, this deep embeddedness can be read at two levels. The first, and arguably more straightforward, is the motivational level. At this level resides the puzzle that pushes the scientist to study a particular socioeconomic phenomenon in the hope to contribute to knowledge.

The second level, more central to present concerns, is substantive. It refers to how individuals act given their limited cognition. In scientific practice, this level is at present split into two. Yet our ultimate argument is that, for a richer epistemic approach, the two sides of this level ultimately ought to methodologically overlap in the scientific practice of *social* science.

On the one hand, there is the scientific side. The scientist in social science, differently from the one in natural science, often cannot control everything as in a laboratory, because her objects of analysis—other individuals—are not easy to parameterize. The greater complexity of individuals means that they are less predictable, in a narrow sense, than planets' motion or rodents' directional response to stimuli in a maze. Still, one can look for broad trends. These are Hayek's well-known *pattern predictions*, which work as long as we stick to rationality as the primitive attribute of human action. Rationality here should be conceived in its more mundane denotation, namely to mean that individuals behave the way they do because they have reason to do so in light of their intents and constraints (e.g., Simon 1985; Boland 2003, p. 40). This reasonableness view of rationality is in agreement with acting through simple heuristics rather than by mathematically optimizing. The majority of us, for instance, routinely place keys in the same spot of our home because it economizes on search costs.

On the other hand, there is the side of the agent under study. Here we know that, *contra* Mill and others, the approach of psychologism is inappropriate. To understand human action the analysis must shift towards the institutional setting by practicing: (i) the situational analysis of Alfred Schütz, Max Weber, and others broadly operating within the Popper-Hayek research program (Koppl and Whitman 2004); and, (ii), comparative institutional analysis, viz. the assessment of the economizing properties of feasible rather than ideal institutional alternatives (Demsetz 1969; Djankov, Glaeser, LaPorta, Lopez-de-Silanes, and Shleifer 2003).

Taken together the two cognitive sides of the substantive methodological level point to the importance of both heuristics (individuals) and institutions (rules). One shorthand to refer to both sides simultaneously is *ecological rationality*. (For a nuanced doctrinal and methodological assessment of both sides of ecological rationality, see Dekker and Remic 2018.)

Koppl (2018, e.g., p. 120) has especially in mind the (non-constructivist) side of ecological rationality dealing with institutions, namely

> an un-designed ecological system that emerges out of cultural and biological evolutionary … processes: home grown principles of action, norms, traditions, and 'morality' … . Ecological rationality uses reason—rational reconstruction—to examine the behavior of individuals based on their experience and folk knowledge, who are 'naïve' in their ability to apply constructivist tools to the decisions they make; to understand the emergent order in human cultures; to discover the possible intelligence embodied in the rules, norms, and institutions of our cultural and biological heritage that are created from human interactions but not by deliberate human design. People follow rules without being able to articulate them, but they can be discovered. This is the intellectual heritage of the Scot-

tish philosophers, who described and interpreted the social and economic order they observed (V. Smith 2003, pp. 469-470).

On the institutional side of ecological rationality the point is thus that institutions, especially those that evolve unintentionally and withstand evolutionary pressure, can compensate for limited cognition.

What about the epistemics of the ecological rationality side regarding heuristics? In this case too ecological rationality is pragmatic rather than logical—it is about what heuristics are feasible and not about which are ideal. Moreover, it is also about evolution: we select simple protocols that work for the immediate purposes at hand; so-called *fast and frugal heuristics* (Gigerenzer, e.g., 2014).

However, rather than compare the efficacy of institutional alternatives in guiding and binding behavior, the heuristics side of ecological rationality compares the efficacy of competing fast and frugal heuristics in enabling rational behavior in light of the environment. The criterion of comparison is the same, but the object of comparison is not. Ecological rationality here explicitly refers to "domain-specific heuristics [and not] optimization, omniscience, or consistency." Heuristics' "success (and failure) is in their degree of adaptation to the structure of environments, both physical and social. *The study of the match between heuristics and environmental structures is the study of ecological rationality*" (Gigerenzer 2001, p. 38, our emphasis).

Methodologically, the bottom line is that the two sides of ecological rationality—institutions and heuristics—ought to be studied simultaneously. When they are not, we lose useful information.

Consider Koppl's observations about the nature of the US state. The US state is deeply entangled. That is, it is an organization subject to "the rule of experts" (Koppl 2018, p. 226). But if experts can fail, then it is not clear why there should be a top-down knowledge imposition. At the same time, Koppl is not overly optimistic about how information choice theory can make a normative difference in terms of removing the imposition. He writes that his scheme for "piecemeal institutional reform (which is mostly borrowed from Vernon Smith) does not have an obvious application to the entangled deep state." If his "diagnosis of the deep state is at all correct, reform is urgently required." At the same time, Koppl does not have "specific ideas on how we might attempt to roll back the deep state with a reasonable prospect of success. … I warned of the dangers of precipitate change. It is fine to exclaim upon the urgency of reform. It would be much better to have a realistic program for such reform. I regret that I do not" (Koppl 2018, p. 234).

Yet the heuristic side of ecological rationality—which is not central to Koppl's analysis—reserves hope. One program for reform is to invest in making individuals more *risk savvy*. It is possible to educate individuals early in life to become better—'more expert'—decision makers; i.e., to follow fast and frugal heuristics from a young age (avoid smoking, brush your teeth, do not free ride, eat healthy, exercise, etc.). Investing in risk-savvy individuals "enables a sustainable solution: citizens who see through manipulation and can make informed decisions themselves" (Gigerenzer 2015, p. 380). Somewhat paradoxically, a possible solution to the tyranny of experts—the entangled deep state—is to improve the expertise of *more* individuals along more than one decision making margin.

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Expert Failure and The Intellectual Crisis of American Public Administration: How The "Fatal Conceit" Continues to Threaten Liberal Democracy

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Roger Koppl's *Expert Failure* (2018) is an outstanding contribution to the epistemic turn in political economy. Koppl draws on the work of Peter Berger and Thomas Luckmann (1966) and F. A. Hayek (1945) to build an argument that subtly moves the discussion on expert knowledge from the incentive structure faced to the social epistemology under alternative institutional arrangements for public policy. In so doing, Koppl doesn't reject either the idea that some actors through specialization earn the authority as "experts" or the idea that incentives play a significant role in any assessment of alternative institutional arrangements. But, his emphasis throughout is how this expert knowledge is both generated and utilized in society in the relationship between experts and citizens in a society of free and responsible individuals.

The book makes contributions at several levels: intellectual history with his discussion of the division of knowledge in society from Mandeville to Hayek; to public choice analysis of theory choice among experts; to market structure theory of the ecology of experts and the organization of inquiry. Simply stated the book is brilliant. And, he provides outstanding illustrative cases—most strikingly from the field of forensic science and criminal justice. But in all these cases the ecology of expertise is emphasized. Bottom line—a structure that relies on monopoly experts is bad for science and bad for society. The contestation provided by competition for ideas is critical for not only the effective use of knowledge, but its generation in the first place.

To give an outstanding parallel development consider the evolution of thought witnessed in the work of William Easterly. In his *Elusive Quest for Growth* (2002), Easterly must begin and end every chapter insisting that *incentive matter*, but by the time we get to *The Tyranny of Experts* (2014), he is emphasizing how bureaucrats from a distance not only do not have the knowledge to achieve the task before them, but in their efforts they often violate fundamental democratic principles of governance. In both works, the incentive effects of institutional variation is never ignored, but in *The Tyranny of Experts* the problem of coordinating the division of knowledge in society is also explored. In Easterly's *White Man's Burden* (2006), he captures this problem in his discussion of the difference between the planners and the searchers. But from a social epistemic perspective, this use of terms demonstrates certain limitations to the analysis no matter how much progress in the discussion was made with these works—searchers don't create new knowledge, they discover that which is already there. But unless certain institutions are in place, certain types of knowledge will not exist. It is not just more costly to discover and utilize knowledge dispersed throughout the economy when we rely on a central planner, the knowledge generated in a competitive market process about values, costs, and alternative uses simply does not come into existence unless within that context. The *knowledge problem* isn't limited to the coordination of dispersed knowledge, but the contextual nature of our knowledge that is generated within specific institutional contexts is discovered by actors within that context, and gets utilized within that context to the benefit of various individuals comprising the society under investigation. (see Lavoie 1985a; 1985b; Boettke 2018b) So Koppl's development of Hayek's discussion of the division of knowledge in society (see p. 119ff) moves the conversation beyond the important insights to be gleaned by emphasizing the incentives to discover that which is in the actor's interest to discover, and to the *epistemic* properties of alternative social ecologies of experts and their interactions with citizens. Koppl refers to his conception of knowledge as SELECT: synoecological, evolutionary, exosomatic, constitutive, and tacit. It is, as he says, a radically egalitarian view of knowledge that challenges all hierarchical models of knowledge

and the role of experts in public policy deliberations. In essence, Koppl is offering his readers a growth of knowledge perspective to the production and distribution of knowledge in society within a liberal democracy, as opposed to the technocratic view of evidence-based policy driven by scientific experts.

My purpose in this reflection on Koppl's *Expert Failure* is to document his connection to the work not only of Hayek and the Austrian School of Economics, but to the Virginia School of Economics (Buchanan) and the Bloomington School of Institutional Analysis (Ostroms), or to what I have termed Mainline Economics (see Boettke 2012; Boettke, et. al., 2016; Mitchell and Boettke 2017). This can be seen first through claims made in the respective Nobel lectures by Hayek (1974), Buchanan (1986) and Ostrom (2009), and second in the implications of this style of argument for the field of public administration. (see Ostrom 1973; Boettke 2018a; Aligica, Boettke and Tarko 2019) As Koppl (see p. 84ff) discusses, the entire subject of expertise raises fundamental issues for a functioning liberal democracy.

Both Vincent and Elinor Ostrom devoted considerable effort to developing a social science that was consistent with democratic governance. It is a priority of theirs that public policy within a liberal democratic society reflects a *governing with* rather than *governing over* view of the relationship between the citizen and the state and the policy expert employees of the state. This was not unique to them, though they perhaps stated the position as explicitly as anyone. But once their position is understood to be in essence the same one championed by earlier liberal theorists such as Frank Knight, then Knight's critique of Keynesian demand management policies as not only based on fallacious economic reasoning but fundamentally anti-democratic begins to make sense. (see Knight 1951; 1960)

In "The Pretense of Knowledge", Hayek (1974) argues that the alliance between statism and scientism has turned economic experts into not only potential tyrants over their fellow citizens, but destroyers of civilization. Buchanan begins his "The Constitution of Economic Policy" (1986) with a reminder to his readers that the core Wicksellian wisdom is that we economists must cease offering advice as if to a benevolent despot. And, in "Beyond Markets and States", E. Ostrom (2009) told her audience that social science advances and is relevant to understanding the fragility of democratic self-governance when assumptions of omniscience and benevolence is rejected. As E. Ostrom (1990, 215) stated the position: "The intellectual trap in relying entirely on models to provide the foundation for policy analysis is that scholars then presume that they are omniscient observers able to comprehend the essentials of how complex, dynamic systems work by creating stylized descriptions of some aspects of those systems. With the *false confidence of presumed omniscience*, scholars feel perfectly comfortable in addressing proposals to governments that are conceived in their models as omnicompetent powers able to rectify the imperfections that exist in all field settings." (emphasis added)

This is, as she repeatedly stressed, a consequence of habits of thought that see the "the government" as presiding over the world, and social science thus conceived as an exercise in providing the tools and training so that the expert external to the system can provide the needed policy advice. This is decidedly non-democratic way of relating to one another. As Vincent Ostrom (1997, 3-4) argued in *The Meaning of Democracy and the Vulnerability of Democracies*: "How people conduct themselves as they directly relate to one another in the ordinary exigencies of life is much more fundamental to a democratic way of life than the principle of 'one person, one vote, majority rule.' Person to person, citizen to citizen relationships are what life in democratic societies is all about. Democratic ways of life turn on self-organizing and self-governing capabilities rather than presuming that something called 'the Government' governs."

Vincent Ostrom had earlier in *The Intellectual Crisis of American Public Administration* (1973, 5) argued that developing a social science that was consistent with a self-governing democratic society would require the next generation to lay the foundations for the study of public administration. "If these foundations are well laid," he argued, "we should see a new political science join a new economics and a new sociology in establishing the basis for a major new advance upon the frontiers of public administration." This would require a rejection of the progressive era development of bureaucratic administration and a reconstruction of the older idea of democratic administration but one consistent with the modern age. The theory envisioned would build on the innovative contributions of property rights economics, law-and-economics, public choice analysis of politics, and theory of private and public entrepreneurship. In short, the new theoretical foundations will be provided by the New Institutionalism that emerged in economics and political economy in the second half of the 20th century, but one that emphasizes the implications of that theory for seeing like a citizen and not seeing like a state.

Vincent Ostrom (1997, 114-116) argued that advances in the art and science of association follows from critically ex-

amining and striving to get "a better understanding of basic anomalies, social dilemmas, or paradoxes, rather than with applying a single abstract model of economic reasoning to nonmarket decision making. The latter concern becomes an exercise in the application of an orthodox mode of analysis in price theory; the former opens important new frontiers of inquiry." He goes on and argues that the future of research must move to "the epistemic level of choice in the cultural and social sciences and to the constitution of the epistemic order with which we live and work." This move cannot be made as long as we continue to work with models populated by actors who are perfectly informed and "operating in unitary States directed by a single Supreme Authority." Instead, we "need to go back to basics to reconsider the human condition and what it means to be a human being relating to other human beings in the world in which they live."

This means that we come to understand human societies as "networks of epistemic relationships" and the self-governing capacity of such networks turns on the systems of checks and balances that are in operation to ensure contestability. Contestability is a necessary condition for "the elucidation of information, the clarification of argumentation, and the quest for innovations to achieve conflict resolution." (V. Ostrom 1997, 293) This is also where Koppl picks up in *Expert Failure*, as it is this institutional structure of contestation that must frame the expert dialogue and the relationship with non-experts in living in a liberal democratic society. Experts to Koppl (see p. 237) are unreliable, and non-experts could potentially be the sources of novelty and improvement. The knowledge assumptions in Koppl's model between the theorist and the actors in the model are important to understand. In most economic models, for example, especially since Robert Lucas, the agents in the model are assumed to know what the theorist knows. But, in Koppl's model (and in Hayek, Buchanan and Ostrom) the actors *in* the model are themselves the source of the creativity and cleverness. The theorist could never know that the actors in the model know, they are the architects of the solutions that solve the social dilemmas and realize gains from social cooperation and craft the rules that enable us to live better together. Elinor Ostrom (1990, 7) captured this insight in her explanation for what she thought was wrong with the traditional prisoners' dilemma game as a central metaphor in public policy. The players are, as she puts it, prisoners, and thus unable by model construction to change the constraints imposed on them. She argues, instead, that she would rather focus on questions of how creative and clever actors change the rules of the game to escape remorseless tragedies. This is a theme should would repeatedly stress, including in her Nobel lecture where she contrasts her approach to policy analysis with the more popular version of "nudging" by aid of incentives. To Ostrom, such a presumption on the part of the theorist to devise nudges is both questionable given the knowledge problems and the trickiness of incentive schemes, and fundamentally antidemocratic in terms of presuming that some can govern *over* others to the betterment of society.

As Koppl ends his book "Competition is likely to be beneficial only if the ecology of expertise has rivalry, synecological redundancy, and free entry." Nodes of contestation must be built into the institutional design. And, when done right liberal democratic governance will "value expertise, but fear expert power." (p. 237) *Expert Failure* is a brilliant contribution to the ongoing scholarly conversation that traces back to antiquity, found in economic theory formulation in the Scottish Enlightenment, and modern representation in the work of Hayek, and the development of modern political economy. We need to continually develop our understanding of the institutional weaknesses and fragilities of self-governing democratic society. We must constitute and reconstitute the societies where we govern *with* one another, rather than relying on experts to govern *over* us, and our social science at a methodological, analytical and social philosophical level must adjust and adapt its practice to be consistent with such a vision of the liberal democratic order, and the ways we relate to one another in citizen-to-citizen interactions. We are, after all, one another's equals. None of us are privileged over others, and in politics none of us can legitimately claim to have access to *the* TRUTH. In a pluralistic vision of society, we focus our attention not on some fictional notion of a unitary State (i.e., stable social welfare function) but on the institutional instantiation of a system of governance that exhibits neither discrimination nor domination. Liberalism, as Koppl points out (see p. 227), supports competition as a means to eradicate privilege, and thus arbitrary and dangerous power relations in the private as well as the public sector. The liberalism Koppl is urging us to consider is *not* a project primarily concerned with recapturing some lost institutional configuration from the past, but a future oriented promise of a better world through institutional experimentation grounded in a radically egalitarian view of human knowledge. It is my sincere hope that Koppl's work will excite the imagination and creative energies of a new generation of political economists to think seriously yet humbly about their primary responsi-

bilities as students of society and the role of public administration in a democratic society. Think—first do no harm—then go from there. Koppl's discussion of social epistemics, the institutional weaknesses of expert rule, especially monopoly experts, and yet the embrace of reason and evidence in a vibrant scientific and scholarly world is to be applauded and more importantly picked up and worked with so we can better understand our practice of the organization of inquiry in a society of free and responsible individuals.

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Epistemics, Experts, and Adaptive Systems

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1. INTRODUCTION

In *Expert Failure*, Roger Koppl has produced a seminal work that provides a wide-ranging and detailed analysis that identifies and addresses a clear danger to the Liberal Order. The intersection of epistemics, experts, and policy forms a major theme in this work and it sheds new light in connecting the ways experts embedded themselves as the new saviors.

Koppl rightly identifies the contributions to social theory of Mandeville, Smith, Hayek, and others. The "knowledge problem," so famously associated with the work of Hayek and contemporary Austrian economists, as Koppl details in Part II of *Expert Failure*, forms one of the principal analytical entry points for market and social theory. Hayek's argument that theoretical and practical constraints impose limits on what individuals can separately know must be reckoned as one of the important contributions of modern economics. This constraint applies to all market participants, including most decisively to experts who may distort the market process through the administrative and regulatory state, central bankers, Big Players and other non-competitive activities.

The rule of experts represents an unwarranted intrusion into the market process in two ways. First, experts claim to have knowledge that does not comport with Hayek's knowledge constraint which may result in failure. Second, the actual activity of experts' behavior may distort the market process. It is this latter matter that I wish to highlight within the rubric of the generation of knowledge and the market's ability as an adaptive order that reflects and produces knowledge as an emergent characteristic of both individuals and, most importantly, social structures and institutions at the systems level.

2. HAYEK AND THE KNOWLEDGE PROBLEM

A guiding principle in the sequence of overlapping ideas that comprise Hayek's *oeuvre* over a long and varied career was that constraints exist on what individuals can know. This theme and its application to foundational questions in economics are already evident in his early essays during the 1930's, including those specifically penned in the context of the debate on socialist calculation (Hayek 1935). For example, in "The Trend of Economic Thinking" (1933), Hayek holds that economics has shown that the "co-ordination of individual efforts in society is not the product of deliberate planning" but that "an immensely complicated mechanism existed, worked, and solved problems, frequently by means [which] could not possibly be the result of deliberate regulation because nobody understood them." Reminiscent of Carl Menger and presaging his own later work, Hayek observes that the functions of the economic process "are discharged by spontaneous institutions" (p. 129) that form part of a "higher organized system" that is best recognized as an "organism and not an organization" (p. 130).

Hayek's identification in his 1933 paper of the existence of a chasm between the complexity of society and the capacity of a single mind to design (or plan and control) such a system, initiates an important direction in his own thinking and one that provides a linkage to his engagement in the socialist calculation debate. His critique centers on the epistemic requirements a central planning board would have to satisfy to allocate resources efficiently in a dynamic economy. Under such circumstances Hayek argues central planners could never bridge the gap between directing the virtually infinite kinds of adjustments in production and pricing consistent with an efficient use of resources. As Hayek (1935) observes in "The Present State of the Debate," the standard assumption for explaining competitive equilibrium was that a "certain range of technical knowledge is 'given'" in the sense that it was not "concentrated anywhere in a single head but that people with all kinds of knowledge

would be available [and] those that make the most appropriate use of the technical knowledge will succeed." Replicating this competitive result under central planning would require that knowledge about the most appropriate technical methods "will have to be concentrated in the heads of one or at best a very few heads." But such knowledge, Hayek notes, does not exist in a form that would lend itself to such application since "most of it consists in a *technique of thought* which enables the individual engineer to find new solutions rapidly as he is confronted with constellations of circumstances" (Hayek 1997 [1935], p. 5, my italics).

In a similar vein to the statements from the calculation debate paper cited above, Hayek pointedly indicated in "Economics and Knowledge" that the

> really central problem of economics … is how the spontaneous interaction of a number of people, each possessing only bits of knowledge, brings about a state of affairs … which could be brought about by deliberate direction only by somebody who possessed the combined knowledge of all those individuals" (Hayek 1948 [1937], pp. 50-1).

The economic problem facing any society, as Hayek would put it later (1948 [1945]), is thus "a problem of the *utilization* of knowledge which is not given to anyone in its totality" and whose success mainly depends on making "fuller use … of the existing knowledge" by "conveying to the individuals such additional knowledge as they need in order to enable them to dovetail their plans with those of others" (pp. 78-79, emphasis added).

At the same time, however, Hayek provides suggestive hints about the *generation* of knowledge. For example, we find in "Economics and Knowledge" (and somewhat ironically not in the 1945 paper) that "we are still pretty much in the dark about . . . the nature of the process by which individual knowledge is changed" and that hypotheses about knowledge "must necessarily run in terms of assertions about causal connections, about how experience *creates knowledge*" (pp. 45, 47, emphasis added). And in "The Meaning of Competition" (1948 [1946]) he notes that when dealing with the plans of several persons "the problem becomes one of how the 'data' of the different individuals … are adjusted to the objective facts of their environment." (p. 93), hinting at the creative and adaptive actions of individuals. These are interesting and potentially seminal insights; all the same, questions regarding the generation of knowledge are left in the shadows. Instead, Hayek's central focus in his catallactic theory refers to the market's capacity to communicate dispersed and tacit individual knowledge, not to the circumstances by which completely new knowledge. Thus, in "The Use of Knowledge in Society" (1948 [1945]) when he speaks of the function of the function of the market system as enabling "the utilization of knowledge not given to anyone in its totality" (p. 78), he exposes himself of the notion that there actually is such a thing as that totality independent of the circumstances of its generation, and that the problem is how best to accumulate and use it. In short, Hayek's emphasis is on the market as a discovery process, not as a emergent knowledge-generating process at the system level.

3. KNOWLEDGE AS ADAPTIVE AND CREATIVE CLASSIFICATION

My interest centers on some generalizable notion of knowledge as an emergent characteristic of individuals and the social structures that arise in which some kind of *classification* is generated. The classification is adaptive and capable of novel (creative) responses involving a highly complex nexus of interactions between the individual and its environment and may take various forms such as market prices and other market phenomena.

When we try to apply this conception to increasingly complex biological and social systems, a variety of complications very naturally arise. We not only encounter organisms that use highly complex classificatory structures capable of producing novel outcomes of their environments, but also various hierarchies of communities having their own distinct structural and functional attributes. Once we enter the world of humans, we must not only take account of single components but also of social structures and systems created by their interactions. Thus, while a useful starting point or initial unit of analysis for social theory is the individual, the analysis cannot either stop there or presume that social systems have no relevant implications for individuals. Indeed, an important claim in the present context is that those broader social structures are decidedly not aggregations of individuals but distinct structures having their own emergent characteristics. In particular, whether our focal point is the family, the community, or the market economy, my claim is that the interactions that take place in these social structures generate their own particular kinds of classifications. This leads to three relevant points:

1. These structures and systems are analyzable as distinct entities, having particular capacities for producing classifications as conditioned (obviously in highly complex ways) by both their functional and structural characteristics and those of their components.
2. The properties of such structures and systems, whether they are designed or undesigned (such as, respectively, a taxis or cosmos) will produce emergent outcomes in the form of the generation of knowledge; however, their respective feedback and stability properties are different.
3. The feedback properties of a cosmos, such as a free market system, incorporate the inputs of all who participate while a taxis, such as a centrally planned economy, is limited to a far smaller set of knowledge inputs; these differences, respectively, are ordinarily revealed in a cosmos as participatory dynamism and in a taxis as turgidity by insufficient feedback constrained by the imposition of predetermined goals by planners.

The knowledge-generating properties of a cosmos (or "spontaneous order") are not simply a summing-up of the inputs but constitute a transformation of those inputs into something different, something that no single individual could have generated. This applies to a system of free markets in generating the constellation of ever-changing market prices. The prices produced at the system level constitutes an adaptive adjustment driven by the knowledge ongoing interactions of individuals who themselves implement their own creative dispositions. These feedback loops are compromised in a taxis because central economic planning precludes access to relevant knowledge beyond the planners' own purview; the absence of a market process under central planning means the range and quality of useful knowledge is constrained by "a single mind," in "Economics and Knowledge" (Hayek, 1948 [1937]) and the ability for the system to adapt is compromised. This is the case even with an "expert" planner—as Hayek (1960, p. 292) put it: "To make the best available knowledge at any given moment the compulsory standard for all future endeavor may well be the most certain way to prevent new knowledge from emerging."

In terms of the questions considered in this paper, the argument that the market generates a unique classification as a consequence of the interactions of market participants is not meant to invest in the market any cognitive capability whatsoever. What matters, rather, is that markets (and other social structures) exhibit capacities for feedback of varying proficiency and agility for generating classifications. The process by which emergent characteristics appear, sustain themselves over some finite period of time, and change or get replaced in the context of transactions and scarcity is the subject matter of the theory of the market process. Such explanations necessarily involve an account of the economics of the interactions of individuals and the feedback mechanisms in order to arrive at the system-level outcome.

4. HAYEK'S EXTENSION OF KNOWLEDGE

The Sensory Order (1952) offers Hayek's clearest statement of an order that generates knowledge. The implicit story contained in *The Sensory Order* is that individuals are not mere processors of information, passively responding to stimuli. Instead, Hayek argues that cognitive activity, despite being constrained by abstract rules, both learnt and inherited, and its own physiology, should be understood as an active, input-transforming, knowledge-generating adaptive system. The cognitive problem Hayek deals with is not about how knowledge is harvested or discovered by an individual, but with the process of a single brain generating knowledge. The intriguing question that *The Sensory Order* raises is whether its insights can be applied to the social domain.

The question arises as to how we should take account of the fact that when individuals interact in various social contexts, those interactions have the capacity to generate certain kinds of social outcomes that reflect a system-level classification over sets of inputs. Hayek seems to have been aware of this when he says:

> The growth of knowledge and the growth of civilization are the same only if we interpret knowledge to include all the human adaptations to environment in which past experience has been incorporated. Not all knowledge in this sense is part of our intellect, nor is our intellect the whole of our knowledge. Our habits and skills, our emotional attitudes, our tools, and our institutions—all are in this sense adaptations to past experience which have grown up by selective elimination of less suitable conduct (1960, p. 26).

And this kind of knowledge, which Hayek then refers to as "tools," is crucial for the process of civilization because its embodiment in traditions and institutions means that it can be transmitted and communicated through time as "tested and generally adopted ways of doing things" (p. 27).

As part of this more extensive application of what constitutes knowledge, Hayek also includes (as we might expect) "abstract (or general) rules" and their manifestation as law:

> If the law thus serves to enable the individual to act effectively on his knowledge and for this purpose adds to his knowledge, it also embodies knowledge, or the results of past experience, that are utilized so long as men act under these rules (p. 157).

We therefore have before us a somewhat finer taxonomy of what constitutes Hayekian knowledge. While I think there is no question that Hayek's conception of knowledge fundamentally sees it as originating as an individual characteristic, he also identifies a kind of system-level knowledge that emerges experientially from social processes. Also significant is the idea expressed by Hayek in *The Constitution of Liberty* (1960) that the law "adds to knowledge," suggesting that by stabilizing rules of property, transference, and enforcement of contracts (Hayek 1960, p. 158), the law actually produces a kind of knowledge essential for social intercourse. At the same time, Hayek is quite clear in seeing such outcomes as adaptations and thus as inherently mutable, with the flip side being that any evolved rule or tool cannot be assumed to be either optimal according to some externally imposed welfare criterion or suitable for all circumstances and times.

The upshot here is that Hayek's general approach is at least suggestive of social structures as adaptive classifying structures. Given this we should first take note that specific capacities for classification and the possibility for higher cognitive functions obviously differ across different kinds of biological organisms and social structures and, thus, for different kinds of adaptive-classifier systems. Once we broaden our conception of "knowledge" to include the generation of classifications at the systems level opens up the scientific process of examining exactly how the market produces certain classifications, what feedback loops exist between the individual components of the system and the system-level outputs (including its own "rules"), what factors determine the classification-generating capacities of systems whose structures differ, and how the system adapts in terms of producing new structures or rules and modifying or retaining others. Whereas the social structures we observe vary in terms of the extent to which they may be placed along a spectrum of undesigned or designed orders, their classification-generating capabilities and characteristics would also figure prominently in their analysis and assessment.

5. ECONOMIC ORDERS, THE GENERATION OF KNOWLEDGE, AND EXPERTS

The market economy is an abstract Hayekian order constituted by: (1) individuals pursuing their own ends under resource constraints and (2) their exchange and production activities involving agreements specifying the voluntary transfer of claims to property. The order that results from these conditions is typically referred to as the *catallaxy*, and it is this order that provides the essential starting point for the theory of market processes. We can invoke a distinctly Hayekian perspective here by noting that individual knowledge is agent-specific and that it is this knowledge that guides each individual's market activities and the particular interactions he undertakes, whether such interactions refer to the execution of a (pre-specified) plan or become modified as a consequence of the process itself as the individual learns more about the environment and himself. Although each individual is necessarily and constitutionally ignorant of many of the details of the actual market transactions that are occurring beyond the immediate confines of his own interactions, market prices emerge from the totality of those ongoing interactions.

Agents learn by participating in the market process—that is, if the market process is a discovery process having the capacity to actually convey useful information to agents (as Hayek and Kirzner would hold), then the path of the process cannot be in any relevant sense preordained. Thus, the constellation of prices that emerge as a result of the interactive processes that constitute the market process cannot be inferred from initial conditions, including quite obviously the particular knowledge of the agents themselves. While clearly any individual may have been able to conceive of a range of possible market prices, it is only through the actual process of market interaction that such a classification can be generated. And in the absence of that market process, those market prices could not have emerged. This point is reflected in Stephan Boehm's insight that "knowledge yielded by market processes is knowledge generated through the operation of the market order—that is, it cannot be generated in any other way" (Boehm 1994, p. 169).

The personal knowledge of many interacting individuals produces a transformation in the constellation of market prices that cannot be explained by any aggregation procedure from those individuals. Market prices are not para-

metric but are an emergent property of the market process itself and cannot be generated by any other process other than the one that gave rise to their emergence. When we look to the market economy, we see a system that appears to perform adaptive and anticipatory functions quite well (McQuade 2018). Paris not only gets fed, but it gets fed differently each day and in a way its unforgiving gourmands desire.

The catallaxy serves as a useful analytical platform for examining the economics of an exchange and production order founded on property rights. Yet, actual market economies rarely present themselves in this pure form; instead, we ordinarily encounter systems where government intervention is often substantial. Such intervention runs the gambit from isolated and limited incursions into specific markets to widespread interventions across markets to the abolition of the price system under socialism. A major component of such interventions can be attributed to Koppl's analysis of "experts."

The point I wish to suggest here is that these systems can be subjected to a comparative institutional analysis in terms of their classification-generating capability. If so, then it is possible to categorize economic systems or orders according to structural characteristics that derive from the framework—the rules, routines, conventions, and institutional arrangements—within which they function. The adaptive qualities of these systems and the outcomes they produce are not only closely tied to their capacities to use dispersed knowledge but also to their capacities to generate classifications. This perspective allows us to expand our understanding of the epistemic implications of different kinds of economic systems by bringing together previously noted insights and perhaps new ones under the broader theme of "adaptive classifying systems" (McQuade 2007).

This perspective directs attention to how the market adapts in terms of the classificatory flows particular kinds of interventions are likely to engender in the context of Koppl's identification of experts, Big Players, and the Administrative State. For example, when we consider the self-proclaimed experts and Big Player effects of discretionary monetary policy, the market's classificatory outputs of interest rates and credit flows will be displaced and superseded by the classifications of the Big Player. Experts fail because their conceit violates Hayekian constraints on knowledge; but their hubris also produces policies and regulations that displace the market process and its knowledge generation. These distortions are often severe and unseen, possibly fomenting serious resource misallocations and system-wide disruptions in productive activities, the redistribution of wealth and income, and wide-spread involuntary unemployment. The causes of such effects are all too often misidentified, resulting in the call for soliciting "experts" to remediate a situation for which they are largely responsible.

We can extend these points to a single Big Player for all markets operating in a regime of central planning. A long and deep literature has decisively demonstrated that central planning suffers from fatal deficiencies in terms of meeting the needs of consumers. Central planning runs afoul of the knowledge problem, as Hayek and Mises argued, because central planners are unable to marshal dispersed individual knowledge and because the absence of a price system prevents rational economic calculation. From the perspective of my comments here, a complementary approach presents itself in that the classification-generating capacities of a central planned economy reflect the limited potential of a "single mind" as opposed to that of the many interacting minds of the catallaxy. Economics provides ample insight that the adaptive and anticipatory properties of the centrally planned system will reflect this difference in crucial and, indeed, alarming ways. As Koppl points out, over-reaching experts, across the scope and scale of policies, may succeed in co-opting and inhibiting the benefits of the market process.

NOTES

1. See Weimer 1982; Gray 1984. Kirzner emphasizes the "continuity of overlapping ideas" of Hayek as opposed to a putative "unity" in his work in "Hedgehog or Fox: Hayek and the Idea of Plan Co-Ordination" (2000, pp. 180-202).
2. Hayek (1933, n. 4) attributes the distinction between organism and organization to Mises, citing his Gemeinwirthschaft (2nd ed.) of 1932, although the distinction was also raised by Menger (1892).
3. See Butos and McQuade (2002), p. 124. In *The Constitution of Liberty* (1960, pp. 24-25), Hayek as much as denies the systemic knowledge-generating effect, asserting that "Knowledge exists only as the knowledge of individuals. It is not much better than a metaphor to speak of the knowledge of society as a whole. The sum of the knowledge of all the individuals exists nowhere as an integrated whole. The great problem is how we can all profit from this knowledge, which exists only dispersed as the separate, partial, and sometimes conflicting beliefs of all men."
4. In *The Sensory Order* (1952) Hayek develops the notion of a cognitive "classification" by the brain. His insight can be generalized to other adaptive-feedback systems, such as the market process. Such systems are generative and capable of emergent outcomes. Much like a finite number of inputs, such as the alphabet and the rules of syntax, such systems can support an infinite number of creative outputs. Also, see Koppl, et al. (2015).
5. To forestall any misunderstandings about the concept of knowledge that might arise in connection with the ontology of these social structures and systems, there is no implied suggestion of anthropomorphism or "collective consciousness," or "group mind. The kind of knowledge possessed and generated by the human brain is reflexive, self-organizing, and purposeful. A spontaneous order, such as the market, is populated by social structures and systems that are non-reflexive, unconscious, and non-teleological. The differences of these orders—the brain and market- however are fully capable of generating emergent characteristics but the kinds of knowledge generated are contingent on the orders in which they operate. See Hayek (1952, p. 4; 1978, pp. 40-41) and Butos & McQuade (2001, pp. 123-125). The suggestion advanced here, then, is really two-fold: first, it recognizes that the capacity to produce a classification is not a uniquely human characteristic, and second, that we should expect classificatory capacities to differ across entities dependent on their structure, complexity, and other characteristics associated with their adaptive capabilities (see Kaufmann 2000, especially pp.114-116).
6. See Butos and McQuade (2017), McQuade (2007, 2018).
7. *The Sensory Order* (1952) offers Hayek's clearest statement of an order that generates knowledge. A major theme is that individuals are not mere processors of information, passively responding to stimuli. Instead, Hayek argues that cognitive activity, despite being constrained by abstract rules, both learnt and inherited, and its own physiology, should be understood as an active, input-transforming, knowledge-generating, creative, adaptive system. Addressing this question has become something of a flashpoint for Hayekian scholars. The current majority stance holds that the relevance of Hayek's cognitive theory is essentially captured by its contributions to subjectivism and to methodological issues, as principally contained in the final chapters of *The Sensory Order* (for example, see Caldwell 2003) and has little direct relevance to economic theory. However, others have uncovered more far-reaching sources of inspiration and applications to economics and social theory of Hayek's work, including the theory of entrepreneurial learning (Butos and Koppl 1999; Butos 2003), economic expectations (Butos & Koppl 1993,1997; Koppl 2002), the economics of science (McQuade and Butos 2003, McQuade 2007), and the theory of adaptive social systems (McQuade 2004, McQuade and Butos 2005, Harper 2014, Lewis 2016). Also, see Vanberg's magisterial Introduction to Hayek's writings on theoretical psychology (2017), and the volumes on *The Sensory Order* edited by Butos 2010 and Marsh 2011.
8. See Butos And McQuade (2017).
9. In *The Tyranny of Experts,* Easterly (2013) criticizes the authoritarian top-down approach retarding economic development. Also see Hamburger (2014) on the administrative (or "deep") state.
10. I thank Scott Scheall, Leslie Marsh for helpful comments and especially those of Thomas McQuade whose imprint permeates this paper. The usual caveat applies.

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Approaching the Singularity Behind the Veil of Incomputability: On Algorithmic Governance, the Economist-as-Expert, and the Piecemeal Circumnavigation of the Administrative State

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> Compared with the totality of knowledge which is continually utilized in the evolution of a dynamic civilization, the difference between the knowledge that the wisest and that which the most ignorant individual can deliberately employ is comparatively insignificant. (Hayek, *The Constitution of Liberty*, p. 82).

1. INTRODUCTION

Roger Koppl's admonishment against design in his book *Expert Failure* is a product of the combinatorial richness of the world and the symmetry-breaking properties of time. Time breaks the symmetry of human experience so fundamentally that the concept of progress—what Robert Lucas said is so profound an idea it is hard to think of anything else[1]—is hidden behind it.

Invoking thinkers from Mandeville to Foucault, Koppl's book dances around what is theoretically out of the reach of the expert: the combinatorically rich and the epistemologically asymmetric. Koppl grants no special powers of vision to his experts. The theorists of system share the same limitations, the same myopia as the people about which they theorize. The future unfurls behind a veil of incomputability beyond which entrepreneurs of ideas and men of system can glimpse a small part, but never the entire vista.

Divested of their ivory tower, do we then conclude that experts play no special role in the progression about which they theorize? On the contrary. To understand the true role of the expert demands placing her first within her work, then tightly binding her eyes. Fumbling, entangled, the unidealized expert feebly and fallibly casts rules in the direction in which her expertise lies, no claim to systemic perspectives she does not possess. Doubly-bound, those upon which the unidealized expert seeks to impose her expertise become safer from the pitfalls Koppl assigns to her rule. Rule-making systems, freed from the reign of idealized experts, become less brittle to bias, ignorance, and small-groups influence, and more able to access the political idea of pluralistic democracy. Let's call the latter, the central thesis of Koppl's book, Koppl's Theorem.

Koppl attends his Theorem with a rich array of evidence and argument, including insights from computability theory and creative economics. It is into these areas I wish to more deeply delve, as they describe both in theory and example how modelers try but fail to wrest with the symmetry-breaking properties of time. I seek to extend Koppl's Theorem with a Corollary. Koppl is concerned about where experts tend to rule, the administrative state, and how a strong administrative state can negatively affect pluralistic democracy; he suggests that the piecemeal deconstruction of the administrative state may strengthen pluralistic democracy (Koppl 2018: 15-20). I believe Koppl commits an error of omission in his analysis, one which pits two sets of expert designers against each other: those who wish to increase the power and scope of the administrative state, and those who wish to carefully deconstruct its power to strengthen pluralistic democracy. By extending Koppl's computability argument to the level of algorithmic governance, and inching us all closer to the technological singularity using a framework of open-ended knowledge division, I sketch out a more realistic progression of the administrative state amidst combinatorially explosive economic growth (Koppl et al 2018).

The singularity is the name of a phenomenon coined by Vernor Vinge to mean the rapidly changing socioeconomic state that will accompany the demonstrated exponential increase in computing power known as Moore's Law[2]. Once in the singularity, the story goes, even relatively near-future economic and social states become impossible to predict. Technological cycles, where entire private and public sectors are replaced or made obsolete through technological progression, will get closer together as we approach the sin-

gularity. The uncertainty horizon, predictions about what the world will be like in any given context in *T* years but beyond which we cannot say, will get shorter and shorter. Some, like the futurist Ray Kurzweil (2005), say the technological singularity will coincide with the merging of human and artificial intelligence.

At bottom, the technological singularity is a theory of *computability,* namely, of the theoretical limits of physically realizable computers to decide decidable things. Let's shed for a moment the trappings of neoclassical theory and look at people as problem-solvers, in the traditional of Herbert Simon (1996). As we approach the technological singularity, intangible goods like mobile apps that rely mostly on quick calls to massive servers will get cheaper to produce. The intangible goods made cheaper to produce by next-generation technological innovation aren't likely to fit the neat categories of public and private defined by last generation's basket of available goods. What's more likely is that technological innovation in intangible goods will continue to piecemeal-circumnavigate administrative obstacles tailored more traditional products and services, thereby unlocking artificially locked-up value. We've already seen this with the sharing economy (Yaraghi & Ravi 2018), currency that enables extra-legal transactions and avoids state-based manipulation (Dunn 2018), and smart contracts that obviate the role of the state in protecting agreements, particularly in extra-legal markets (Hardy & Norgaard 2015).

> **The Piecemeal Circumnavigation Corollary**: The approach to the technological singularity shall be characterized by a piecemeal circumnavigation of the administrative state rather than the piecemeal deconstruction of the administrative state (as suggested on Koppl 2018: 16). Furthermore, untethering expertise from the administrative state shall unlock the value of extra-public social entrepreneurship.

Two parts are required to demonstrate the reasonableness of the Corollary. The first is to dig deeply into the nature of computability in a complex adaptive open-ended evolutionary social system characterized by individuals and institutions who exploit existing economic and social opportunities and create novel opportunities. Section 2 is our spelunking expedition into computability and the application of what we discover to expert theory. Section 3 deep-dives into the relationship between time, open-ended creative evolution in social systems, and expert theory. Section 4 presents evidence and argument that algorithmic governance harnesses the advantages of increasing computational power in a more agile way when it is allowed to emanate from polycentric (public-private) sources, instead of solely public sources. We also spend some words on the mechanics of piecemeal deconstruction versus piecemeal circumnavigation. In Section 5, we close with a short discussion on what radically subjectivist economists, as experts, should do in the run-up to the technological singularity.

As both Koppl and myself are economists, I am interested in the application of Koppl's Theorem to the economist-as-expert. Fredrich Hayek believed that one of the tasks of economics is to bound the designs of the men of system[3]. If an economist believes his is a science of allocations, he must know the cases for which his methods can reasonably say something about allocative states, but especially, the cases for which his methods *cannot* reasonably say something about allocative states. And similarly, for economists who believe themselves cycle-preventers, growth-promoters, or scientists of human action.

I hope to show in the course of this paper that Koppl's Theorem holds both for traditional kinds of expert rule, and for how expert rule evolves with rapid technological advancements, particularly in computing. I hope to show that the veil of practical incomputability places hard and fast limits on what experts can do even as we vastly extend the ability of people to understand and affect their world. There is no Holy Grail of Data Collection that will suddenly make the impossible possible, which may dash the hopes of some utopian economists (Lange 1972). No expert, no matter how powerful, can see behind the twin veils of time and incomputability.

2. THE COMPUTABILITY OF COMPLEX ADAPTIVE SYSTEMS

The meaningfulness of applying equilibrium theory to macroeconomic trends has long been in question. In Wicksell's *Geldzins and Güterpreise*, the author speculates that his model for stabilizing inflation "does not appear to me to be ripe for methods of precision" when the debate still raged as to in which direction economic processes react to causal factors (Wicksell 1898). Hayek warned of equilibrium's use in macroeconomics, saying that he believes the concept of equilibrium and pure analysis methods "have a clear meaning only when confined to the analysis of the action of a single person," and that economists are "introducing a new element of altogether different character when we apply it to

the explanation of the interactions of a number of different individuals" (Hayek 1937: 35).

How and why people act the way they do, and what kind of social arrangements are possible, depend largely on how and what orders erupt spontaneously through time. Orders erupt on several levels, which we call *micro*, *meso*, and *macro.* The micro level consists of ontologically separable components like individuals, groups, and organizations. The macro level consists of trends on outcomes involving the separable components. The meso level is the intermediary layer whereby components entangle through time to produce macro trends such that the process and structure of entanglement are non-decomposable to some simple relationship between the micro components (Dopfer and Potts 2004).

It is notable that neoclassical economic theory has difficulty addressing the meso level, even though analysis at the meso level is as important to explaining and understanding the evolution of individual and social outcomes as the other levels (Dopfer 2007).

We can see the difference between models that traditionally ignore the meso layer and those that incorporate it by looking at the functional mappings between components at the micro level and trends at the macro level described by neoclassical economics. Consider a two-tier representative agent model:

$$\begin{array}{ccc} \mathrm{M(t)} & \rightarrow^{h} & \mathrm{M(t+1)} \\ \uparrow^{a} & & \uparrow^{c} \\ \mathrm{A_i(t)} & \rightarrow^{f} & \mathrm{A_i(t+1)} \end{array}$$

At the lower level, representative agent i is at some state $\mathrm{A_i}(t)$ at time t. $\mathrm{M}(t)$ is the aggregate of the states of all agents i using some kind of metric or statistical measure to represent the states of the agents so that they can be added together. $\mathrm{M}(t + 1)$ is the aggregate at time $t + 1$. a, c, f, h are functions that map from either one state to the next, or from level to level.

It is tempting for economists to suppose some model $f(\mathrm{A_i}(t)) = \mathrm{A_i}(t + 1)$, and some model $c(\mathrm{A_i}(t + 1)) = \mathrm{M}(t + 1)$ such that changes at the micro level will realize desired changes at the macro level. If the economist believes they can apprehend the effects of both f and c—perhaps using statistical models on data to infer relationships, or by attempting to get at at the functional model forms directly using machine learning techniques—then their route to attaining desired effects at the macro level is $c(f(\mathrm{A_i}(t))) = \mathrm{M}(t + 1)$, where f is some behavioral intervention at the micro level and c is the change in agent behavior from which the new macroeconomic trend $\mathrm{M}(t + 1)$ arises (traditionally, some sort of aggregation). Similarly, we see how $c(f(\mathrm{A_i}(t))) = h(a(\mathrm{A_i}(t))) = \mathrm{M}(t + 1)$.

Note that the above model doesn't explicitly take into account an intermediate structure to economic interactions. There are no other variables, no other functional interactions between individual agents, or between agents and institutions like associations, firms, or political groups.

Let's see how explicitly including a meso level of socioeconomic structure complicates the coherence of neoclassical microfounded macro theory:

$$\begin{array}{ccc} \mathrm{M(t)} & \rightarrow^{h} & \mathrm{M(t+1)} \\ \uparrow^{j} & & \uparrow^{k} \\ \mathrm{B_i(t)} & \rightarrow^{g} & \mathrm{B_i(t+1)} \\ \uparrow^{b} & & \uparrow^{d} \\ \mathrm{A_i(t)} & \rightarrow^{f} & \mathrm{A_i(t+1)} \end{array}$$

Remember that the meso level is where interaction and entanglement occurs, and interest groups, creative organizations, and (endogenous) rules and norms emerge. We can no longer in general say that $c(f(\mathrm{A_i}(t))) = h(a(\mathrm{A_i}(t))) = \mathrm{M}(t + 1)$, for we must first define agent-institution interactions b and d, institution evolution g, and institution-macrostate interactions j and k. We can only do away with the intermediate meso layer if we can reasonably argue that macrostates are reducible to their agent-components. This reducibility would then compress away the intermediate layer, in a sense encoding the intermediate layer in the functional relationships between agent behaviors and macrostates. Is it reasonable, however, to say that macrostates are generally reducible to agent behaviors? Let's recast the argument in terms of levels of complexity, and what we're really doing when we reduce away the meso layer.

Understanding the meso layer isn't just about how to round off statistical errors in linear relationships between micro components and macro trends. The meso layer is where virtually all the work of how people come together to form and reform social systems is done. Acknowledging that social systems are complex adaptive systems is about refocusing economic theory on the complicated, tangled, messy meso. It's about not zooming too far up from the micro level, but just far enough that we can start to see the emergence of structures. It's about an economic theory of clustering, context, cascades, and cycles. Not just in cost and choice.

The complex adaptive nature of social systems becomes even more clear when we think about two recent examples in which traditional prediction in the social sciences failed, and complexity-aware models were more successful at predicting or explaining observed behavior. The first is the cascade of events leading to the Arab Spring, which were unpredicted, and wrongly attributed to democratization except by complexity-aware models (Gard-Murray & Bar-Yam 2015; Parens & Bar-Yam 2017). The second is the herding and patterns of diffusion through banking networks that led to the bank failures that sparked the Great Recession, which were not predicted by widely used dynamic stochastic general equilibrium (DSGE) models, and were better explained by nonlinear, context-aware models (Haldane and May 2011; Helbing and Kirman 2013).

In complex adaptive systems, spontaneously ordered processes are generally *irreducible* to designed mechanisms. This is similar to Hayek's (1964) proposition that the classification of any phenomenon must be conducted by a theoretical apparatus of a higher degree of complexity than the phenomenon[4], and Stephen Wolfram's Principle of Computational Equivalence (2002). Beckage et al (2013) provide a compelling argument that social systems exist at the highest possible level of complexity, moreso than physical and even biological systems.

Generally, spontaneous ordering processes do not reduce to some set of instructions issued to individuals by an expert, policymaker, or some other agent. Instead, macrobehavior consists of overlapping sets of locally informed behavior which do not aggregate but rather interact in complicated ways to produce apparent patterns. Economists therefore need a concept of *systems*.

Systems thinking means looking at a system not just as the sum of its component parts, but as something more. Any social system with more than a few members is an example of a complex adaptive system that is irreducible to its component parts (Miller and Page: 2009). An economic theory based on a direct relationship between individual agents and macroeconomic trends suffers from a fundamental lack of ability to explain and predict the systemic properties of the macroeconomy as a whole; to explain and predict Great Recessions or Arab Springs.

Economists need a language of systemic behavior that is not simply reduced to a composition of individual behaviors. Given that economic decisions in any modern economy involve a combinatorically huge space of possibilities and opportunity costs, it is safe to say that however people make choices, it's likely to be more ecologically than individually rational (Gigerenzer et al 2000; Smith 2003). Economic agents do not choose "as if" they are utility maximizers, either, contra Friedman (1953). For if they did, the macroeconomy as a system would be reducible to its component parts. Even more concerning would be what is left unexplained by such a statement, namely, *what it is people are actually doing to make choices*. Business cycles, technological cycles, the economic effects of climate change, financial cascades, the hockey-stick growth trend—these are the bread-and-butter of economists, and these are the very kind of phenomena general equilibrium theory and "as if" equivalencies have difficulty with.

Design-by-expert also overlooks a concept so compelling that it drastically alters how we believe experts can change our world: undecidability. Economists choose how the transformation $f \circ c : A_t \rightarrow M_{t+1}$ realizes "better" outcomes for the agents that make up the system, which requires a measure of what it means for a macrostate to be "better." Call that measure W for "welfare." But there may be instances in which we can't decide if $W(M_{t+1}) \geq W(M_t)$, particularly in the presence of multiple equilibria or cycles[5]. In this case, there is no path $f \circ c : A_t \rightarrow M_{t+1}$ such that $W(M_{t+1}) \geq W(M_t)$ defined by this particular measure of welfare.

So, if economists want to build a model of some phenomenon, to reduce it from inscrutably complex reality to a simpler, scrutable form, we need reducibility. If we then wish to alter the state of the phenomenon in a way that positively affects the society within which the phenomenon is housed according to some measure, we need decidability. Computability is the next step: given such a model, can we in principle compute the algorithms $f \circ c$, W that satisfy the conditions laid out above? Furthermore, can we in *practice* compute these algorithms—are $f \circ c$, W constructive, in the sense that they can physically realize the outcomes we are able to prove they can in principle realize?

True physical realization is not a point to scoff at. Even when we in principle prove the existence of a Paretian welfare optimum, we have yet to prove they can exist in practice[6] (see in particular Lewis 1992; Velupillai 2007).

The federal government is one of the largest employers of economists. Whether or not policies created by the economists-as-experts can be practically realized is crucial to validity of policy results. The point of change through political institutions is not to simply muse if it is possible in principle to make the next generation of working-class urbanites better off, it is to create policies informed by experts meant to achieve actual results. Adding uncertainty in—changing unique precise equilibria to rational expectations

equilibria—doesn't give one any more juice if the expert assumes, quite realistically, that agents in the model don't have access to perfect information about the entire economic system constituted by the model (Spear 1989).

Koppl (2018: 171-2) is generous with his treatment of computability theory. He introduces the standard notion of Turing computability wherein a computable function is a function that can be emulated by a Turing machine on a (possibly incredibly powerful) computer. Turing machines are simple computational systems that can be envisioned as a rotatable printer head printing along a potentially endless strip of paper, each line determined by the angle of the head and what was printed on the previous line. Universal Turing machines exist that can, in theory, emulate any possible computer program (Turing 1937; Shannon 1956).

Since we wish to talk about computability in this constructive, realizable sense—computability in practice as opposed to computability in principle—we will adopt David Wolpert's (2001) definition of computability: a program is computable if it can be compiled on a computer to complete a task in practice[7]. This means that computability in the Turing sense is not enough, we also require constructivity—the ability to physically realize the computation in question. Furthermore, a phenomenon is computable if a computer can emulate it and make predictions about future states of the phenomenon, i.e., if it can run a program emulating the phenomenon faster than the actual dynamic progression of the phenomenon (Wolpert 2001: 7-8).

Some of the main contributions to the application of computability theory to economics have been in the form of negative results, which imply positive results regarding mathematical methods in economics. Namely, the economist "doesn't attempt to analyze the impossible, or construct the infeasible, and so on" (Velupillai 2017). To say we lack a foundational theory of computable economics isn't to say that we cannot or should not advance the theory. A negative theory of experts, as Koppl's Theorem is—titling his book *Expert Failure* gives that away—advances the idea that a theory of experts needs to firmly embed expert advice, behavior, and influence in a framework that acknowledges all such advice must be implemented in a constructively computable way.

As economists, we must care about computability, because the frontiers of economics and public policy are algorithmic. The paramount concern of an economist-as-expert in an algorithmized world is the computability of their model. This is going to create a burgeoning field of people—social scientists, engineers, programmers, even physicists and mathematicians—whose jobs are to develop computationally solvable social models (Sipser 1997). The need for practical realization will drive complexification, and force developers to abandon incomputable, nonconstructive blackboard models where experts hovered above reality, never touching it.

3. TIME AND THE DIVISION OF KNOWLEDGE BEHIND THE VEIL OF INCOMPUTABILITY

"[T]o acting man the future is hidden. If man knew the future, he would not have to choose" (Mises 1998: 105). Choice is only choice under uncertainty. But what kind of uncertainty, and what do we mean by knowing the future?

Economics is mathematically founded, and as such we can readily answer this question: if our domain is the opportunity space S, and our range is the outcome space O, then choice is defined as a function $f : S \rightarrow O$. "Knowing" the future means there exists an inverse f^{1} such that if $f(s) = o$, then $f^{1}(o) = s$. So, choosing man can simply choose his desired outcome o and be able to intuit which s will attain that o. The same is true if we alter the outcome space slightly to be a distribution of expected outcomes. "Knowing" the expected future means there exists an inverse f^{1} such that $E[f(s)] = o$, then $f^{1}(o) = f^{1}E[f(s)] = s$. f needs to be 1-1 for the inverse to be defined.

Epistemological considerations are essentially everything in economic theory, the difference between calculable risk and incalculable uncertainty, the difference between sheer ignorance and error, the difference between knowledge utilized by individuals but stored outside of individual and explicit speculative models meant to guide us from the inception of any goal to its conclusion. The epistemological embeddedness of social theory is central to Koppl's thesis on expert failure.

To help discuss the ways in which epistemological considerations cannot be compressed to given known distributions at the microeconomic level and exogenous randomness at the macroeconomic level, Koppl categorizes types of knowledge to illustrate what experts and individuals claim to know, and can know. Koppl defines SELECT knowledge as "Synecological, EvoLutionary, Exosomatic, Constitutive and Tacit" (Koppl 2018: 120). Synecological refers to knowledge held outside the individual, in groups of other people, or in some other kind of social institution; evolutionary refers to knowledge gained through time; exosomatic refers to knowledge held in objects like smartwatches; constitu-

tive refers to to do something is conveyed in the doing; and tacit refers to knowledge that is inexpressible, yet relevant.

Contrast SELECT knowledge to speculative knowledge, the models scientists and experts form meant to explain the world. Speculative knowledge may be informed by elements of SELECT knowledge, and it may inform how individuals develop their knowledge in certain subjects, but it is the attempted abstraction of knowledge, not knowledge itself.

Synecological and evolutionary knowledge inextricably depend on the movement though time. Synecological knowledge is a kind of knowledge division, and thus enables the division of labor and specialization. Similarly, the cost of obtaining useful knowledge decreases when knowledge is stored in an easily accessible, distributed fashion, thus *adding something extra* to what we get from utilizing distributed knowledge.

People divide knowledge not just because they can't apprehend everything there is to apprehend at any given point of time, but because the sheer movement through time will tend to shrink their knowledge of the world relative to everything there is to apprehend at any given time. This holds even more true for people whose plans are more time-sensitive. When thinking about the work social knowledge division does, it's not enough to simply think of a collection of people taken together, we must also think about how those people are related to each other. By explicitly considering relationships between economic agents, say, by explicitly modeling economic behavior on a social network as in Devereaux and Yuan (2019), we are able to produce quite naturally the "extra stuff" of knowledge division.

This "extra stuff" of knowledge and labor division deserves its own section, as it hints at a concept of the production of novelty from two existing things, or at a creative economics as in Koppl et al (2015). As a way of conceptualizing this "extra stuff" and its importance to an economic theory that has a chance at explaining economic change and growth, let's consider the useful concept of *togetherness*.

Togetherness, as defined by Bob Coecke (2017), is the sense for which two abstract objects produce something novel when put together. $\otimes$ is a familiar symbol from its common use as a tensor product such that if V and W are two different vector spaces, $V \otimes W$ is a new vector space. $\otimes$ in Coecke's definition is more general, such that the symbol represents the "new stuff" we get from bringing two objects A and B together. Notably, in both definitions, the $\otimes$ product between two objects is not equal to the linear decomposition of those objects. In tensor products, we don't just, say, add two three-dimensional spaces and get a six-dimensional space. Instead, we consider all combinations of each dimension, and end up with $3 * 3 = 9$ dimensions.

But that new dimensionality is given by a particular mathematical definition of how $V \otimes W$ combine to create new things. There are other ways that two objects can combine to create new things. we can even abstractly define one object as "stuff now" and the other as "movement through time," and express togetherness as a process by which new things are added to some phase space of all things. Koppl et al (2019) produce a "hockey stick" graph whose shape closely reproduces the global economic growth trend from AD 1 by simply explicating how the space of product combinations grows through the addition of new things, then substituting combinatorial growth for technological growth in traditional macroeconomic grow models.

One of the most fundamental ways of producing togetherness, most damning to the man of system, is sheer movement through time. To move through time means to move into the unknown, to gain something unexpected, to lose something ineffable. t progresses to $t + 1$ and, in the process, hatches something new, something that confounds the discovery of the hard-and-fast rules f that correspond with the complicated reality we experience. This is the essence of what we mean by creation, and by a creative universe. Only complex-enough systems—biological systems, ecological systems, man's imagination, man's imagination plus the imaginations of other men (Beckage et al 2013) —have symmetry-breaking properties.

The creative movement through time, such that creation is the addition and subtraction of the as-yet unknown of and outside man's imagination, is what the philosopher Henri Bergson referred to as *durée*.

Henri Bergson was a subjectivist French philosopher, whose philosophy Frank Knight labeled "irrationalistic" (Knight 1964 (1921): 209). As Knight understood it, Bergson's philosophy centered on "real change" in Knight's words, or what Bergson himself called durée. We can understand durée using a simple mathematical example. Consider a typical path function f that takes inputs and produces outputs. In economic theory, paths like f are constructed through a space of economic possibilities, with constraints like an assumed form of the utility function and budget constraints. This space of economic possibilities is known in complexity science as a "phase space," which is "the space of pertinent observables and parameters, within which the system unfolds" (Koppl et al 2015: 2). Path functions that transform continuously through time, often used by econo-

mists in growth theory texts to indicate policy functions, operate like so: $\pi(t) / E \rightarrow \pi(t+1) / E$. π is entirely defined over some economic phase space *E* (like the space of all possible consumption bundles and agents) for all possible values of *t*. Functions of this sort change through time, but they cannot be said to have *durée*. Durée is better described as the following transformation: $\pi_t (t) / E_t \rightarrow \pi_{t+1}(t+1) / E_{t+1}$ where $|E_{t+1}| > |E_t|$. The functional form π, the value of the form at *t*, and the phase space *E* are altered by time's arrow.

Not so "irrationalistic," just not expressible in static neoclassical economics where $\pi(t) / E \rightarrow \pi(t+1) / E$. The open-ended, creative framework can give us insight into theoretical formulations that don't have good representations in neoclassical economics. If we take Hayek at his word, that indeed the division of knowledge is the most central problem of economics (Hayek 1937, 1994), then we must wonder at how we economically experience the gains from the division of knowledge through time. For example, we can use Israel Kirzner's (1997) concepts of ex ante and ex post corrections as a kind of model of knowledge division in our framework. Represent π_t as the knowledge utilized by an economic agent to carry out some plan, and the mapping from ex ante knowledge to ex post corrections to knowledge as $\pi_t(t) \rightarrow \pi_{t+1}(t+1)$. The model an individual uses to make decisions recursively alters through time by means of learning—it "alters when it alteration finds." It is not just reactive to others, who form the field over which the function is defined, but to its own output. We can abstractly represent the generation of Kirznerian "surprise" by some transformation $E_t \rightarrow E_{t+1}$, where $|E_{t+1}| > |E_t|$. When we extend the Kirznerian metaphor for knowledge division from the individual to the system level, we get back our transformation from above: $\pi_t(t) / E_t \rightarrow \pi_{t+1}(t+1) / E_{t+1}$.

4. ALGORITHMIC GOVERNANCE BEHIND THE VEIL OF INCOMPUTABILITY

Algorithms may seem by definition practically computable and therefore suitable tools for conducting social theory. But algorithms are implemented with goals in mind, in particular, as proper means to attain some set of goals. Algorithmic governance is, simply, the increasing reliance by public officials on classifier-type algorithms in public-sector functions like the determination of taxes and benefits, regulatory oversight, and predictive policing (Perry et al 2013). Machine learning like deep learning algorithms and genetic algorithms are examples the kinds of classifier algorithms popular among social scientists.

As of February 2019, searching for "algorithmic governance" on Google Scholar turns up 661 results, 81% of which were published since 2015. The main issue in many critiques of algorithmic governance is reality creation, whereby a bias towards the status quo in algorithmic decision-making results in the realization of that status quo, even if, absent algorithmic decision-making, the status quo may not have persisted (Devins et al 2017; Boracas & Selbst 2016). Machine-learning algorithms used in many algorithmic decision-making procedures are only as accurate as their data, and data collected relevant to social systems tends to be heavily biased towards the status quo (Boracas & Selbst 2016). This results in strange results like the "Jared effect," where an algorithm built to rank CVs concluded that the strongest, most significant indicators of job performance were being named Jared and having played lacrosse in high school (Gershgorn 2018). A famous experiment by Amazon to algorithmically rank hires was scrapped when the algorithm scored an application lower based on the applicant being female (Dastin 2018).

Another issue with algorithmic pattern matching is the plethora of spurious correlations—ghostly patterns that appear to have correlative meaning in any data set, but are not, in fact, linked by some non-random underlying generating process. Calude and Longo (2017) warn against the substitution of correlative methods like classifier algorithms on Big Data for the scientific method. The authors use ergodic theory, Ramsey theory and algorithmic information theory to prove that prediction is generally contraindicated in large-enough data sets (ibid: 601-2), that large-enough data sets will always exhibit at least one highly regular pattern even if they are randomly generated (603-4), and that for an arbitrary correlation function and a large enough data set, we can always find a correlation between some subset of *n* elements (ibid: 606). Thus, Big Data comes with big challenges; the bigness of data is not a panacea to the problem of developing models of social systems complex enough to be reasonable representations of social phenomena.

Artificial intelligence is not just about pattern matching. The very problem with correlative frameworks, where $Y = a X + e$, is that they lack the asymmetric and often irreversible framework of causality (Pearl & Mackenzie 2018). Causal systems, where $X \rightarrow Y$, have a sense of time baked into them. Could causal inference be a way around the limitations on pattern-matching algorithms? But causal inference suffers from some of the same problems as correlative models when applied to complex adaptive social sciences, particularly the form suggested by Pearl & Mackenzie,

that depend on the use of Bayesian belief networks. Cooper (1990) showed that this sort of probabilistic inference is NP-hard, a categorical membership that indicates practical incomputability in general.

From the meta-perspective of how science develops reasonable algebras of questions and answers to those questions, we find ourselves, as social scientists, in a kind of bind. As observed by Ioannidis (2012), "science is not necessarily self-correcting," by which he refers to traditional methods of science like hypothesis-testing. But algorithmic methods on Big Data suffer from their own kind of myopia. Certainly, for economic as a science, we can derive three lessons from our analysis so far: 1) our methods and models should be practically computable, 2) understanding knowledge division requires models where reasoning is asymmetric both within a phasal cross-section of time and evolutionarily, 3) algorithmic methods will not replace failing neoclassical methods and should not be used *on their own* as a magic wand to generate policy in the absence of reasonable backing theories.

However, we are certainly embarking upon an age of algorithms, in public governance and in private service provision. We have demonstrated that algorithmic decision-making is no public policy-making panacea. But we haven't yet discussed the nature of an *ecology* of algorithmic solutions to all kinds of problems, both public and private. The efficacy of a solution is, to paraphrase the physicist Richard Feynman, in whether it tests true or not. Which means that more efficacious solutions are possible in a system which regularly tests the outcomes of algorithms, and especially in one with some kind of endogenous mechanism to alter algorithmic solutions when they are in error.

We can categorize algorithmic solutions as kinds of intangible goods. There are many valuable intangible goods whose cost of production has been traditionally high, like standards of trustworthiness and currency dependability. So high that many justify public production of these intangible goods based on the assumption that whatever private solution might emerge will not service those who want them very well. There are also tangible goods like public transportation that interact strongly with intangible goods like connecting prospective riders with transportation systems that can accommodate them. It's the production of these sorts of intangible social goods in which we are especially interested, and where we derive the Corollary to Koppl's Theorem.

The approach to the technological singularity is characterized by an emergent ecology of algorithmic solutions. These solutions, as we've described above, are constrained by practical computability. They are also enabled by how epistemological togetherness is produced by time and creativity *when they are allowed to take advantage of epistemological togetherness*. The best solutions shall be the solutions that can best exploit the new opportunities that will rush forward in the ensuing combinatorial expansion of the economic phase space. This is when comparative institutional potentialities and drawbacks will come into their sharpest focus.

The institutional realities of public provision tend to exacerbate principal agent problems in innovation, to incentivize budget maximization rather than efficient and competitive use of funds, and to shift funds from research towards rent-seeking. As elaborated upon by Buchanan & Wagner (1999 (1977)), Buchanan & Tullock (1962), and as surveyed in Tollison (1982), there is a tendency in democracies towards redistribution from less to more politically powerful people and groups. Combining these insights with Koppl's Theorem and with the arguments of this paper, we should expect the political realm to be a much less agile innovator of intangible solutions to public goods problems. In addition, the state doesn't have any natural advantage in algorithmic solutions due to its relatively large scope and reach. We've already gone over how increasing the size of data sets comes with complications that do not necessarily improve the accuracy and predictive power of algorithms. So, when intangible solutions to public goods problems start to become feasible, it is reasonable to expect that social entrepreneurs who do not restrict themselves to purely public methods of provision will have an epistemologically competitive edge over purely public channels *given* the burgeoning abundance of new possibilities unlocked by the approach to the technological singularity.

As such, we expect there to be an inevitable piecemeal circumnavigation of traditionally public channels of social goods provision for social goods that are themselves intangible or are greatly enabled by intangible solutions. We are already seeing evidence of this piecemeal circumnavigation. There is the well-known example of how intangible solutions in computation enabled the emergence of the sharing economy by circumnavigating the regulatory burden placed on traditional forms of competition, often as a result of decades of rent-seeking. Despite efforts often initiated by traditional competitors to shut down sharing apps in various places, it's estimated that the sharing economy will unlock 335 billion dollars worth of value by 2025 (Yaraghi & Ravi 2017). Another major example is the development of

cryptocurrencies, which could help people protect their investments and circumnavigate bad monetary policies like runaway inflation (Dunn 2018). The risks of engaging in extralegal market activity are being symmetrized through developments in smart contracts, which rely on alterations to a blockchain ledger to track and sometimes manage exchanges (Hardy & Norgaard 2016). Some are proposing smart contracts for legal businesses, too (Comm 2018). The omnipresence of smartphones is unlocking the ability for individuals to better surveil their own homes, protect against unwanted intruders using smart doorbells that automatically upload footage to an app shared by people in the neighborhood (Rubin 2018), monitor babysitters and pet sitters, and record traffic and police incidents using widespread and inexpensive dash cams. And we've only just begun to experience the innovative power of the "third wave" of internet-based technological innovation, characterized by omnipresent ambient technology, perpetual connectedness, and useful artificial intelligence (Ma 2011).

5. WHAT SHOULD ECONOMISTS AT THE EDGE OF THE SINGULARITY DO?

If the approach to the Singularity has the effect of further tipping the balance from fixity towards change, then economists will find ourselves taking Bergsonian durée and Kopplanian creative synecology more seriously out of sheer professional survival. Economic theory will either continue to make half-hearted attempts at dynamism through endogenous random walks or exogenous random shocks, succumb to the logical end-state of statistical inference and turn the whole business of theorizing over to AI, or it will begin to take seriously the idea of founding its theories in practically computable processes.

Economists as practitioners are often asked to advise or create policy, and as such, the economist-as-expert is embedded in the mechanics of the administrative state. If the economist-as-expert believes that pluralistic democracy has better outcomes than authoritarian democracy due to the pressures of competition, she should consider the advantages to pluralistic democracy when social entrepreneurs are untethered from the incentives to rent-seek, and administrators, from capture. Not only is the value that would have been tied up in rent-seeking and capture unlocked, but competitive pressure can stay higher when anti-competitive rules can't be purchased with the right amount of rent and clout.

It is my suspicion that ever-increasing change will continue to erode the efficacy of traditional political channels of pluralistic democracy relative to non-traditional, extra-political channels of pluralistic democracy, if we broaden the definition of democracy to mean something more like the ability of large-enough groups of people (in this case, consumers) to realize social outcomes. A sketch of a potential situation is as follows: What we may see replace traditional channels of pluralistic democracy is an increasing reliance on using artificial intelligence to incorporate change into policy, as political cycles and the reaction time of legislation become too long compared to the public's desired rate of change (which shall increase in concord with the socio-technological rate of change). Policy will become more algorithmic and will continue to detach itself from public comment and political consequences. Choosing good political representatives will matter less, and the opportunity cost of voting based on impulse and emotion rather than based on reasoned reflection will go down.

During a combinatorial explosion of goods that have the potential to solve traditionally public problems, pluralistic democracy under algorithmic governance by an administrative state becomes less effective *at an increasing rate*. The costs of circumnavigating administrative constraints, on the other hand, *goes down*. The costs of deconstructing or changing administrative constraints via the political process will, however, *go up* as the administrative state continues to insulate itself from political consequences by virtue of an increasing reliance on automated decision-making processes.

What does all this mean for the design of political institutions? The time component of the veil of incomputability creates an irreducible togetherness relation with the ontological objects of individual and social existence. In a sense, this veil of incomputability veils Rawls's veil of justice, defining his Original Position, the objective core of rights unilaterally agreed-upon by equal, contextless, timeless beings. If there is no ideal Person devoid from time, if we are created as we go through time, then we are, in a sense, made new as we encounter and interact with formerly unknowable things. This suggests a kind of irreducibility to the togetherness relation between the individual and time, one that confounds Rawls's thought experiment. The knowledge we gain through time informs our sense of justice, the rules we would agree upon with others in the Original Position. But we become different people as we add to our knowledge. Which knowledge time-slice is the "true" us, the person

who can equitably vote on rights for herself and everyone else?

Perhaps cutting individuals from their social and historical fabric obscures more than it illuminates. If we follow the implications of Koppl's Theorem, we realize the expert exists at the same epistemological level as those who utilize her advice, and therefore the economist-as-expert is best utilized when she faces the constraints and pressures of a normal market. Furthermore, if we accept that as we approach the technological singularity the desire for structured expertise will not dissipate while the cost of accessing good quality expertise will go down, we must conclude that the seeker of expertise will tend to avoid expertise with normative frames and relevancies incompatible with her interests when seeking to solve both personal and social problems, which supports the Corollary. This does not mean that there will be consensus. On complex social issues that depend on relevancies, we would expect a complicated, interacting ecology of solutions to arise.

Historically, it has been difficult to sustain a stable interacting ecology of different solutions to social problems. My analysis suggests that economists might just get the chance to watch such a reality arise if we can curb our impulse to design and learn to love mucking about in the combinatorial chaos with everyone else.

NOTES

1. "I do not see how one can look at figures like these without seeing them representing possibilities. Is there some action a government of India could take that would lead the Indian economy to grow like Indonesia's or Egypt's? If so, what exactly? If not, what is it about the "nature of India" that makes it so? The consequences for human welfare involved in questions like these are simply staggering: once one starts to think about them, it is hard to think about anything else." (Lucas 1988)
2. Though there is some controversy over whether or not Moore's Law still applies or has begun to slow.
3. "The curious task of economics is to demonstrate to men how little they really know about what they imagine they can design. To the naive mind that can conceive of order only as the product of deliberate arrangement, it may seem absurd that in complex conditions order, and adaptation to the unknown, can be achieved more effectively by decentralizing decisions and that a division of authority will actually extend the possibility of overall order. Yet that decentralization actually leads to more information being taken into account." (Hayek 1988: 76)
4. Hayek proposed this in his Sensory Order, in particular reference to the human mind being fundamentally unable to comprehend its own innerworkings.
5. Famous examples of such cases exist in the form of Sonneschein-Mantel-Debreu, and in Arrow's Impossibility Theorem.
6. This is due mainly to the employment of the Law of the Brouwer Fixed Point theorem (Brainerd and Scarf 2005). in the proof of existence of unique welfare equilibria in the standard corpus of economic theory. While a subset of economists have attempted to prove that indeed one can have a Computable General Equilibrium theory, their proofs generally include a nonconstructive theorem, often the Bolzano-Weierstrauss theorem.
7. As noted in Bridges (2001), definitions of computability based on the system of classical logic, the normal system of logic that the vast majority of working mathematicians employ based on ZFC, the Zermelo-Fraenkl axioms plus the Axiom of Choice, do not discern between computable algorithms in principle (possibly nonconstructive) or in practice (provably constructive).

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Expertise, the Administrative State, and Corporate Governance: a Comment on Koppl

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This essay draws on an ongoing book project called *The Corporation and the Twentieth Century*.

I am grateful to have this opportunity to comment on—or maybe I should say riff on—*Expert Failure*, the wonderful new book by my old friend Roger Koppl. The book argues "that there is a market for expert opinion whose structure determines the reliability of experts and the power of non-experts" (Koppl 2018, p. 37). Because Koppl takes a Hayekian view of what a market is, he sees a market as inherently about learning. Competition—in the true sense of entry unrestricted by legal rights of exclusion—is not only about levels of price and quantity but also about what we know. This is salient and crucial when the product itself is—what we know. Economics and epistemology are interpenetrated.

Expert Failure is thus a critique of the view, common among intellectuals as well as people on the street, that expertise, and indeed science, consist in privileged access to the truth. (Economic corollary: if truth is a pre-existing resource that certain people are technologically best equipped to dispense, then maybe truth is a natural monopoly like water or sewer, and maybe truth should be centralized and regulated.) The privileged-access view is at least as old as Plato (or maybe even Socrates, Koppl tells us), and it was especially prominent in the United States among the Progressive intellectuals of the late nineteenth and early twentieth century, a group to whom I will return. As Koppl understands, however, science and expertise are not about dispensing truth; they are about groping toward truth, through a social process of competition among conjectures (Popper 1963).

Because he came at the theory of expertise from the study of forensic evidence and testimony, Koppl tends, quite appropriately and usefully, to frame expertise in terms of an individual presenting a judgment or opinion. Of course, promulgating an opinion almost always takes place in some bureaucratic context—children are taken away from a parent because an expert decrees it. Koppl is worried about the validity of the expert's opinion, but at the same time he is also concerned about the discretion the expert enjoys within the bureaucratic system. An expert exercising discretion is an instance of the rule of men (and nowadays women) rather than the rule of law. A system with wide discretion for experts is a lawless system. Yet, as we know from Max Weber, a bureaucracy is a system of rules and depersonalized roles. The flunky who came to the door to take the kids away had no discretion; she was just following the rules.

Because I approach expertise from the perspective of organizations—hierarchies as well as markets—I am interested in the nexus between expertise and administrative organization. Koppl considers this to some extent in his chapter on the entangled deep state. Central planning, he says, is "an extreme form of expert failure" (Koppl 2018, p. 221). Not only do central planners enjoy a monopoly on "planning advice," they are also big players with discretion, and they actually tell people what to do rather than merely advise them. I want to think a little more about the organization of, and about and the origin of, "expert" bureaucracies of the sort implied by central planning, using examples from the Progressive era. This will allow me to think a bit about the administrative state (if not necessarily the entangled deep state), including the issues that Koppl (and Hayek) raise about corporate governance.[1]

ORIGINS OF THE ADMINISTRATIVE STATE.

It is certainly true that Progressives favored the rule of experts over what Koppl calls a polyarchy. Koppl points to the views of Woodrow Wilson as typical of the Progressive desire to turn government functions over to a hierarchical administrative structure controlled by experts. One should note that along one dimension, however, the Progressives were actually trying to substitute the rule of law

(or at least the rule of rules) for the rule of men. When Wilson says that "[a]lthough politics sets the tasks for administration, it should not be suffered to manipulate its offices" (1887, p. 210), his target is actually the system of political patronage—a polyarchy?—that had dominated American government throughout the nineteenth century. That was the nineteenth-century "deep state" (Balogh 2009). In the abstract, a system of politically neutral bureaucrats sounds better than a decentralized federalism of rent-distributing ward healers. But as Randall Holcombe (2002, p. 156) and others have argued, the rise of the federal civil service actually created a new political constituency with its own interests, notably in increasing the size of government.

The ultimate polyarchy is the sphere of private action—"the market."[2] The American founders, like Madison in *Federalist* 10, very much wanted to preserve the sphere of private action against what they considered the problem of "faction," and they looked for the solution to faction in negative restraints: separation of powers; checks and balances; individual rights.[3] It was these restraints that Progressive thought wished to sweep aside, thus moving resource allocation increasingly from the private sphere to the political sphere. "This is what Progressives everywhere meant when they claimed that the mere negation of power was not enough. The focus of politics turned from constitutions to administration" (Rodgers 1998, p. 54). In this respect, Progressive thought encouraged and provided intellectual backing for what, as we will see, was already happening in the federal political economy of the era.

The sweeping away of individual rights was a central theme of Herbert Croly's *The Promise of American Life* (1909), one of the foundational documents of Progressive thought (Nichols 1987). In a world in which negative restraints like individual rights were to be cast aside, how would the problem of faction be resolved? How would competing interests be adjudicated, not only in the political arena but in day-to-day activities? Progressive thought had an answer to this question: modern science. As Richard Adelstein (2012, p. 11) has pointed out, if one rejects the strategy of caring for and cultivating an unplanned order, the only alternative is deliberate planning of some sort. Planning requires a common goal; it requires an information system to construct the plan; and it requires a system of control to see to it that the plan is executed. Science could supply all of these—even, perhaps surprisingly, the common goal. The proof of this, the Progressives believed, is that the large industrial firms of the era were successfully applying science to engineering and management.

American industrial firms were indeed attempting to systematize management in the late nineteenth and early twentieth centuries. And we might well think about these efforts as "scientific," even if not in the sense in which the Progressives understood the term. In Europe, production could draw on reservoirs of long-established craft skills, but American manufacturing faced a different problem, both because the extent of the market was expanding rapidly and because American firms needed to rely on relatively unskilled (increasingly immigrant) labor. In effect, American firms had to substitute organization for skilled labor; management had to specialize in devising and maintaining systems of mass production that could be staffed by the unskilled. Systematic—ultimately "scientific"—management emerged out of these efforts to design production and organizational systems. Simplifying the tasks of workers with time-and-motion studies, what Frederick Winslow Taylor and his cohorts are popularly known for, was in fact but a small part of this effort (Chandler 1977, pp. 172-181; Litterer 1963).

This work was scientific in a very real sense: it was an example of trial-and-error learning. Standardization and the formalization of principles were not inputs to this process; they were the results. Flushed with their success, however, the proponents of scientific management, and the Progressive intellectuals who looked to them for inspiration, saw matters otherwise. For them, scientific management was "scientific" in that it applied formal methods in order to discover hidden truth. As captured in the catchphrase of Taylor's colleagues and competitors Frank and Lillian Gilbreth (1920), the goal of scientific management was to discover the One Best Way to solve any organizational problem. It followed that, by applying scientific methods broadly to social organization, politics could insulate itself from the demands of faction without resort to pesky negative restraints. If there is one best way to solve every problem, then we can simply entrust social decision making to experts armed with scientific knowledge. If there is one best way to solve every problem, even the issue of conflicting goals disappears, since who could disagree with the scientifically correct course of action?

Scientific management was widely influential in Progressive thought, most often walking hand in hand with a belief in the virtues of bigness and centralization. Croly believed that free competition led to waste and that efficiency required centralization. It also required science. "The necessary increase in efficiency can ultimately be derived from only one source—from the more comprehensive and more

successful application to industry of scientific methods and of the results of essentially scientific research" (Croly 1914, p. 397). Surprisingly, even Louis D. Brandeis agreed. Along with Woodrow Wilson, whose principal economic advisor he became, the future Supreme Court Justice was among the few Progressive intellectuals enthusiastic about a world of small economic units, a world he wished to promote at the expense of efficiency if necessary (McCraw 1984). Yet Brandeis had begun reading the work of Taylor; and when he was retained by a group of shippers to fight a rate increase the railroads had requested from the Interstate Commerce Commission, he brought forth a parade of top efficiency experts to testify that the roads needed scientific management not higher rates (Brandeis 1912). (According to one expert, the roads could save $1 million a day.) This was not merely lawyerly strategy; Brandeis was a true believer (Adelstein 2012). Like Croly and others, he saw scientific management as the silver bullet for aligning conflicting interests. And like Croly, he was surprised and hurt that labor unions didn't agree.

The reasons for wanting to move economic activity out of the private sphere and into the political sphere were not merely an ideological matter, of course: there were tangible interest at play as well. At the heart of the Progressive movement was the desire to overrule the allocations of the private order so as to redistribute rents to favored groups like agriculture, organized labor, and White Anglo Saxon Protestants generally. Thus, in effect, the Progressives wanted the same kind of rent management as the political bosses of the nineteenth century—they just wanted the allocations to be "scientific" and to benefit a different set of constituents. The fear that open competition, including free immigration, would harm favored groups was at the bottom of the fervor for eugenics among the Progressives (Leonard 2016). In large measure, this desire for redistribution tracked the Public Choice landscape of the era. We can see this in an example Koppl mentions: railroad regulation. Citing Posner, Koppl tells us that the Interstate Commerce Commission was "captured" by the railroads—a clear instance of expert failure. Expert failure it was, but the story is a bit more complicated.[4] So is the meaning of "capture."

At the state level, the U. S. in the early nineteenth century was highly regulated in ways that protected incumbent interests (Hughes 1977). Because of high transportation and transaction costs, and to some extent because of the U. S. Constitution, the federal space was far less regulated. With the coming of canals, the railroads, and the telegraph, an altered economic geography began knitting the country together economically, drastically changing the federal political economy. Railroads were the first flashpoint. Because they are high-fixed-cost industries, railroads cannot cover their total costs if they price at marginal cost. There were two solutions to the problem: collusion to raise rates above marginal cost and price discrimination. As it always does without government support, collusion failed.[5] But although there was intense competition on trunk lines whenever there were alternative routes to ship long distances, many localities were served by only one road, and the railroads could thus raise short-haul rates on routes with few alternatives.[6]

Since the railroads had become essential to the livelihoods of vast numbers of farmers and producers of raw materials, however, the pricing policies of the roads carried significant distributional implications. Both sides wanted the federal government to intervene: the roads wanted help in policing cartels, and the shippers wanted to prevent both cartels and rate discrimination. The legislative collision of a railroad-oriented Senate bill with a shipper-oriented House bill resulted in the Interstate Commerce Commission in 1887, a train wreck that pleased no one. Gabriel Kolko (1965) famously argued that the legislation was the work of and redounded exclusively to the benefit of the railroads. More recent scholars think otherwise; indeed, if anything it was the short-haul shippers who benefited most from the legislation (Gilligan et al. 1989).

However weak the commission was, it nonetheless represented in embryonic form a solution to political conflict over rents that would be repeated many times in American history and that would lead in aggregate to the administrative state: if legislation cannot satisfy multiple clients, keep the legislation vague and let experts—a commission—sort things out. Overt and more-or-less transparent distributional conflict is thus relocated to a more-specialized administrative arena. Wide discretion for bureaucratic experts is one possible result. Gridlock is another.

The railroad problems of the nineteenth century had revolved around overbuilding, fragmentation, and rate wars, which the Interstate Commerce Act had done little to ameliorate. By the early twentieth century, the problems were quite different, even if political opinion had not yet caught up with the change. During the prosperous years in the recovery from the depression of 1893, private-equity syndicates backed by Wall Street investment houses like J. P. Morgan and Kuhn, Loeb—"communities of interest," in the lingo of the day—had emerged to reorganize and rationalize the railroads, creating a rail system that was begin-

ning to impress foreign visitors for its scope and efficiency. It was a time of growth, in which the roads invested heavily in improvements such as double-tracking, rail yards, and stations rather than new routes (Neal 1969). As the roads now had enough market power to cover fixed costs, rebates were no longer important to them, and they increasingly saw themselves as the victims of powerful shippers wanting concessions. With the support of railroad interests, Congress passed the Elkins Act in 1903 to outlaw rebates, a law that unsurprisingly proved difficult to enforce.

This was also a period of inflation, driven by increases in the world stock of gold. Shippers, who saw their rates increase as a result, continued to agitate for rate regulation by the ICC. Penned by the ICC itself, the Hepburn Act of 1906 expanded the commission and granted it the power to set "just and reasonable" maximum rail rates whenever a shipper or competing railroad complained. The meaning of "just and reasonable" the legislation declined to elucidate. As shippers instantly complained the minute their rates were raised, the short-term effect of the legislation was to freeze rail rates at their 1906 levels, which were not much higher than 1899 levels. The longer-term effect was to stint the flow of capital into the railroad industry (Martin 1971, pp. 128-136).

During World War I the roads were nationalized as the United States Railroad Administration, with William Gibbs McAdoo (Woodrow Wilson's son-in-law) as its first director general. After the war, the railway workers union, which had benefited greatly from nationalization, wanted to keep the railroads under federal control with a buyout of private owners; McAdoo asked Congress to keep his Administration in business for at least another five years. The new Republican Congress had other ideas. The roads would be returned to private ownership, but the ICC would be conferred unprecedented regulatory authority over them.

Like its predecessors, the Transportation Act of 1920 was a compromise (Boies 1968, pp. 608-613; Hoogenboom and Hoogenboom 1976, pp. 84-118). Shippers wanted a return to the pre-war system of maximum-rate regulation, plus additional controls and interventions; the railroads, as always, wanted pooling—minimum rates not maximum rates—to solve the fixed-cost problem; and unions wanted a labor board to mediate disputes. The House and Senate produced conflicting bills, which the conference committee reconciled by deferring all the hard choices to a greatly amplified ICC. The commission gained the power to fix not only maximum rates but also minimum rates—indeed, any rates it liked. The relatively simple price-ceiling scheme was transformed into a complex system of administered prices. In addition, the ICC was instructed to consolidate weak lines into the stronger ones, something the railroads had long before discovered was a bad idea. The commission was told that it must approve not only all extensions of service but all abandonments as well. A new Bureau of Finance within the ICC would approve all securities offerings.

This worked every bit as badly as one would expect. Local knowledge lay with the railroads, who had little incentive to cooperate with the commission. Yet the commission had to approve virtually every significant business decision the roads were making. As a result, the commission became a bottleneck: in fiscal 1928, for example, the rate-making division had to decide 469 rate cases and 548 finance cases (Hoogenboom and Hoogenboom 1976, p. 99). Even though almost all of these decisions were actually made by staff bureaucrats, the commissioners were nonetheless so absorbed in this process that they had no time for thinking broadly about railroad policy. The commission was unable to formulate a coherent approach to measuring costs let alone standardize accounting practices (Miranti 1989). When the ICC attempted to execute its mandate to consolidate the railroads, based on ideas from William Z. Ripley of Harvard, it was quickly overwhelmed by a mountain of information and contradictory counterproposals (Hoogenboom and Hoogenboom 1976, pp. 106-107). It did nothing. In general, indeed, the commission simply muddled through and capitulated to the superior local knowledge of the railroads. At this point we might say that the commission had been "captured" by the railroads. In fact, important commissioners like the Progressive reformer Joseph Eastman, a protégé of Brandeis, never saw eye to eye with the roads. The ICC was simply victim of the phenomenon Oliver Williamson (1975, p. 14) calls information impactedness. That is what capture really means. It is the form that expert failure assumes when the job of allocating resources, not just the job of handing out opinion, is moved into the political sphere.

THE CORPORATE GOVERNANCE OF EXPERTISE.

In writing about the entangled deep state, Koppl naturally thinks about the role of business, and cites Hayek's views on corporate governance—views that may surprise many readers. In an essay first published in 1960, most of which is devoted to an argument against "corporate social responsibility" that is very much in the spirit of the better-known article by Milton Friedman (1970), Hayek decries "the com-

plete separation of management from ownership, the lack of real power of the stockholders, and the tendency of corporations to develop into self-willed and possibly irresponsible empires, aggregates of enormous and largely uncontrollable power" (Hayek 1967, p. 311). Hayek also warns of the dangers of allowing corporations to hold stock in other corporations, which permits a pyramiding of holding companies: an apex company can hold controlling stock in daughter companies, which can in turn hold stock in other companies, and so on down the line, providing the owner of the apex company with control of vast resources that are mostly owned by minority shareholders.

Economists reading this will immediately associate these concerns with the work of Berle and Means (1932), which, as everyone knows, was the first important articulation of the agency problem between managers and stockholders. Berle and Means noticed for the first time that American corporations were increasingly being run by professional managers and no longer by their owners. Stockholding had become diffuse, reducing the incentive for stockholders to exercise control and giving managers free rein to pursue their own interests at the expense of those stockholders. As is true of a good many things everyone knows, however, all of this is wrong. Berle and Means were far from the first notice or worry about the separation of ownership from control. Their famous book was in fact arguably the culmination of a longstanding Progressive discussion of corporate governance that prominently included Woodrow Wilson, Louis Brandeis, and the sometime railroad expert William Z. Ripley[7] (Wells 2010). More significantly, Berle and Means were not in fact concerned with agency problem between managers and stockholders (Lipartito and Morii 2010).

In the nineteenth century, large enterprises—mostly railroads—were financed almost entirely with debt, giving investors no say at all in running those enterprises. As capital markets developed in the early twentieth century, equity became a more common investment vehicle, and many corporations gained significant numbers of small minority shareholders. But as was well understood, most corporations were nonetheless controlled by powerful blockholders. In some cases these were the founders or their families; in other cases, investment houses like J. P. Morgan named directors and kept a watchful eye. Brandeis's most famous work, *Other People's Money* (1914), was aimed precisely at control by investment banks. For all these writers, the problem wasn't that managers failed to act in the interest of owners: they all believed that managers were dispassionate experts not out for their own gain.[8] The problem was the separation of (minority) ownership from the control of (majority) ownership. Progressives were not always united on whether minority shareholders even mattered. The real problem was that strong blockholders would act in their own interests (maximizing shareholder value) rather than in the "public interest." In a sense, the problem was *too much* owner control.

Like Hayek, the Progressives opposed pyramiding, which they saw as another mechanism for exploiting minority shareholders, through what is now called *tunneling*: moving resources from one subsidiary to another. Present-day finance theorists understand that exploiting minority shareholders in this way is not free. Investors can always vote with their feet; and to the extent that corporations are opaque or otherwise give investors reasons to fear adverse tunneling, that fear will be priced in and will raise the corporation's cost of capital. This is not to say that so-called investor protection rules might not be a valuable public good. An equilibrium in which investors do not fear exploitation and demand a lower premium may be a better equilibrium than one in which they do anticipate exploitation and insist on a higher premium. Private organizations like the New York Stock Exchange typically adopted various kinds of investor protections, though it was easy enough to trade on the curb or through investment banks. As De Long (1991) has argued, investment houses like Morgan were substitutes for investor protection in a world of relatively unsophisticated capital markets.

Contrary to what Koppl suggests (pp. 227-228), the jury in the finance literature is still out on whether there is a lot of negative tunneling in the world (Khanna and Yafeh 2007). There can also be positive tunneling. Especially in regions with underdeveloped market institutions, tunneling within pyramidal business groups can be a mechanism for entrepreneurial investment and technology transfer. In effect, business groups can provide the institutional structure that weak states lack (Langlois 2013). At the same time, of course, it is in precisely these kinds of economies that pyramidal groups can become crucial partners in the rent-distributing political coalition that North, Wallis, and Weingast (2009) call the natural state. Indeed, most of the world's pyramidal business groups are in emerging economies (Colpan et al. 2010). Large pyramidal groups do also thrive in some rich liberal democracies like Canada and Sweden. Here too, however, rent distribution may be part of the issue. In Sweden, for example, concentrated business-group control over the economy arises from a bargain with the dominant Social Democratic Party, which needed to

keep capital in the country in order to generate the resources necessary for its social programs (Högfeldt 2005).

Pyramids began to rise in the U. S. in the early century, especially in the 1920s. In railroads, holding companies, notably the elaborate pyramids of the Van Sweringen brothers in Cleveland, emerged as a way to circumvent regulation by the 1920 Railroad Act (Bonbright and Means 1932, p. 226). Most pyramids were in the utility sector, where state laws required all utility companies to be chartered in the state of operation, leading to complex ownership structures with a bizarre geographical dispersion (Neufeld 2016). All of these pyramids collapsed in the Great Depression; and, inspired by the work of Brandeis and of Berle and Means, the New Deal made their demise permanent (Kandel et al. 2013). The U. S. became one of very few countries in the world to tax intercorporate dividends, and rules promulgated by the Securities and Exchange Commission made it almost impossible to acquire a subsidiary without buying out all the minority shareholders. By the time Hayek called for outlawing pyramids, the U. S. had already eliminated them for all intents and purposes. The closest thing we have to a pyramidal business group today is Berkshire Hathaway.

Already by the 1920s, businesses had become alert to the agency problem between all workers—not just management workers—and the goal of maximizing equity value. Many sought to channel into widespread equity ownership the ferment for investment that Liberty Bonds had generated during the war. If workers owned a piece of the company, they would take a more proprietary interest in their jobs; and if they had a share of the profits, they would be less likely to unionize. AT&T was the leader in attracting wide minority ownership. In 1931 it was the mostly widely held stock in the world, with more than 600,000 shareholders.[9] In addition, AT&T created a well-publicized Employee Stock Ownership Plan. Others quickly followed suit, and by 1928 more than 300 firms had set up an ESOP, with 800,000 participants and $1 billion invested (Ott 2011, pp. 156-157).

Characteristically, Brandeis and Wilson saw the issue in moralistic terms. "Most men are individuals no longer so far as their business, its activities or its moralities, is concerned," Wilson told the American Bar Association in 1910. "They are not units but fractions; with their individuality and independence of choice in matters of business they have lost also their individual choice within the field of morals."[10] Wilson's individualism extended to the arena of corporate social responsibility. "Corporations do not do wrong," Wilson told the ABA. "Individuals do wrong, the individuals who direct and use them for selfish and illegitimate purposes, to the injury of society and the serious curtailment of private rights. Guilt, as has been very truly said, is always personal. You cannot punish corporations" (Ripley 1927, p. 4). That is to say, Woodrow Wilson held exactly the same theory of corporate social responsibility as Hayek and Friedman.[11]

After World War II, the individualism of the minority investor was still under threat, albeit now from professional managers controlling retained earnings rather than from powerful blockholders and investment banks. Although there probably remained greater blockholder control in large firms than has been popularly believed (Holderness 2009), it is nonetheless the case that many blockholders became bankrupt during the Depression, and tight financial regulation, high personal income-tax rates, and eventually the capital controls of Bretton Woods made it costly to operate through financial markets and relatively cheaper on the margin to allocate resources within firms. Retained earnings skyrocketed, and American corporations held three times as much cash relative to assets in the middle years of the century as they did in the 1920s or the 1980s (Graham and Leary 2017). Postwar Progressives considered the cash to be in good hands: control by expert managers was both inevitable and desirable (Galbraith 1967). Nor should managers employ the retained earnings to maximize shareholder value. That would only lead to short-sighted investment decisions instead of the kind of farsighted planning at which managers excel.

It was in this context that Hayek was writing in 1960. He was explicitly influenced by the ideas of the financial consultant Louis Kelso, perhaps the leading post-war advocate of the ESOP. Writing with the philosopher Mortimer Adler in 1958—under the unprepossessing title *The Capitalist Manifesto*—Kelso argued for what we now think of as the shareholder-value principle, though with a midcentury twist that would amuse and astound present-day holders of Apple and Amazon. Living in a world of regulated and repressed financial markets, Kelso and Adler couldn't imagine why stockholders would want capital gains. "Corporations are not merely permitted indefinitely to plough back the wealth produced by their capital. They are constrained to do so by the effect of the steeply graduated personal income tax on the dividends received by their larger stockholders. Though the benefits of this involuntary investment by stockholders are to some degree vaguely reflected in the increased market value of the stockholder's shares, this is a fragmentary and frequently elusive substitute for receipt by the stockholder of the full return on his capital" (Kelso and

Adler 1958, p. 218). The solution: make the dividend decision a choice for every individual stockholder. Corporations would have to disgorge all their retained earnings unless the stockholder explicitly permitted reinvestment.

Within a couple of decades, of course, the Bretton Woods system would collapse under the weight of the Vietnam War inflation, bringing in train the collapse of much of the system of financial regulation and repression. As they had in the early century, strong blockholders, in the form of private equity, could operate once again, and they began to unmake the managerial structures of the middle part of the 1900s (Langlois 2003). Mainstream finance theory quickly ensconced the principle of shareholder value, which, like Kelso and Adler (and Hayek), it saw as threatened by the power of professional managers wielding retained earnings (Jensen 1986). In contrast to the Progressives, modern finance theory saw large blockholders as working in the interests of minority shareholders to increase share value. And instead of a hokey investment gimmick, modern theory argued for removing anti-takeover defenses (and other pro-management legal arrangements) in order to allow true competition to discipline (expert) managers. This, it seems to me, is the real Hakeyian (and Kopplian) solution to the problem of corporate governance. Let expert would-be managers compete in the market for corporate control.

NOTES

1. This essay draws on an ongoing book project called *The Corporation and the Twentieth Century.*
2. There is too often a tendency to "refer to 'the market' as if it were an institution parallel with, and alternative to, the government as an institution. The government is indeed an institution, but 'the market' is nothing more than an option for each individual to choose among numerous existing institutions, or to fashion new arrangements suited to his own situation and taste" (Sowell 1980, p. 41).
3. In Federalist 10, Madison says this. "By a faction, I understand a number of citizens, whether amounting to a majority or minority of the whole, who are united and actuated by some common impulse of passion, or of interest, adverse to the rights of other citizens, or to the permanent and aggregate interests of the community." Madison argues that faction cannot be eliminated—there is no such thing as a common public interest. Faction can only be curbed by constitutional restraints.
4. "The railroads supported the enactment of the first Interstate Commerce Act, which was designed to prevent railroads from practicing price discrimination because discrimination was undermining the railroads' cartels" (Posner 1974, p. 337). As we will see, the roads supported one version of the bill, but for different reasons, and they didn't get their way. In 1877, the railroads very much wanted price discrimination; it would not be until the twentieth century that they opposed rate discrimination. I should add that Posner is actually arguing against the "capture" theory in favor of the kind of Public Choice account I offer here.
5. "In no other industry," writes Herbert Hovencamp (1991, p. 1039), "have attempts at both legal and illegal cartelization been so persistent, widespread, systematic, or ultimately doomed to failure."
6. This is an example of what is now called Ramsey pricing: charging higher prices for products inelastically demanded and lower prices for products elastically demanded. It is an efficient solution to pricing in a multi-product context in the face of high fixed costs (Baumol and Bradford 1970).
7. Ripley was in fact a man of many interests. His widely influential first major work used cranial measurements to argue that there was not just one Aryan race in Europe but three: Teutonic, Alpine, and Mediterranean. Of the Jewish "race" he warned that this "swamp of miserable human beings ... threatens to drain itself off into our country" (Ripley 1899, p. 372).
8. "No better principle in carrying out business has yet been worked out than to find able men and give them the completest latitude possible in handling the enterprise" (Berle and Means 1930, p. 60).
9. Of course, AT&T had an additional reason to acquire minority ownership: to fend off state ownership, which had happened in virtually every other developed country. By becoming the classic "widows and orphans" stock while paying dependable higher-than-market dividends, AT&T could bribe a constituency that had significant overlap with its rate payers (Lipartito and Morii 2010, pp. 1056-1057).
10. Reprinted as "Before the War: How Things Looked Then," chapter 1 (essentially a preface) in Ripley (1927, p. 3).
11. Needless to say, Wilson believed it should be illegal for one corporation to hold stock in another. In this respect, Wilson's views on corporate governance generally are essentially the same as those of Hayek.

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Ignorance and the Incentive Structure confronting Policymakers

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Abstract: The paper examines one of the considerations that determines the extent to which policymakers pursue the objectives demanded by constituents. The nature and extent of their ignorance serve to determine the incentives confronted by policymakers to pursue their constituents' demands. The paper also considers several other consequences of policymaker ignorance and its relationship to expert failure.

I have received valuable feedback on previous drafts from Helen Baxendale, Peter Boettke, Bill Butos, Gene Callahan, Bruce Caldwell, Young Back Choi, Nick Cowen, Parker Crutchfield, Erwin Dekker, Tyler DesRoches, Malte Dold, Ross Emmett, Andrew Farrant, Jeffrey Friedman, Michael Gifford, Nicola Giocoli, David Harper, Sandy Ikeda, Andy Khoury, Stefan Kolev, Roger Koppl, David Levy, Leslie Marsh, Erik Matson, Thomas McQuade, Gary Mongiovi, Sandra Peart, Mario Rizzo, Eric Schliesser, and Gerardo Serra, as well as from two anonymous referees. The standard caveat applies.

Keywords: political epistemology; policymaker ignorance; government failure; public choice; David Hume; expert failure

IGNORANCE AND THE INCENTIVE STRUCTURE CONFRONTING POLICYMAKERS

> *Chairman Senator J. William Fulbright (D-Arkansas):* "Among the other comments you made that arouse my interest…[is] that you are not looking at this purely from a moral standpoint, but from a practical one, of what can be achieved. You call attention to the great differences in the culture and race and language and so on between this area and other areas where we have become involved.
>
> I take it by this you mean that this is simply not a practicable objective in this country. We can't achieve it even with the best of will."
>
> *Former Ambassador George F. Kennan:* "This is correct. I have a fear that our thinking about this whole problem is still affected by some sort of illusions about invincibility on our part, a feeling that there is no problem in the world which we, if we wanted to devote enough of our resources to it, could not solve. I disbelieve in this most profoundly."
>
> Testimony regarding the Vietnam War before the *United States Senate Committee on Foreign Relations*, February 10, 1966

PRELIMINARY CLARIFICATIONS

My goal in this paper is merely to expose an important point that has heretofore been largely obscured and to draw out some of its implications. The paper considers several of the consequences of *the problem of policymaker ignorance*, i.e., the simple and, once it is first recognized, obvious fact that what can be deliberately achieved through political action is necessarily constrained by the nature and extent of policymakers' ignorance, and their capabilities for learning.

My approach to the problem might look rather strange to some readers. My method is that old (some might think anachronistic) philosophical workhorse, conceptual analysis. I set out my research question, explicate my assumptions, state the relevant thesis, and draw out several of its more apparent and important implications. I do not, however, provide a wealth of independent empirical verification of these implications. (Of course, if the thesis is right and the logic from which these implications are drawn is valid, such independent empirical verification is wholly unnecessary.)

I do not aim to provide a comprehensive analysis of the problem or to deduce all of its consequences. Neither am I concerned in the present context with any possible methods of solving or mitigating the problem. There are many ways that policymakers might seek to improve their knowledge. Most relevant in the present context, of course, are all those so-called "experts" whose judgments frequently in-

form the policymaking process.[1] However, given that policymakers are neither omniscient nor omnipotent, unless we think such expert-policymakers infallible and the other learning devices available to policymakers perfect, we must accept that policymakers are sometimes ignorant. The consequences discussed in the present paper manifest insofar as policymakers are indeed ever ignorant.[2]

The paper is meant to be the opening salvo of a new political-epistemological research program focused on the implications of policymaker ignorance for the possibilities of effective deliberate political action and, consequently, for the necessity of the intervention of spontaneous forces to effect certain political objectives. If we can gain greater clarity about what can and cannot be deliberately achieved through political action, we also (*ipso facto*) achieve greater clarity as to which political objectives can and cannot be realized without the aid of spontaneous forces. It is here that empirical concerns will enter the future research program. Considerations such as the epistemic requirements of a potential policy objective and the epistemic capabilities of a set of policymakers are theoretically and, at least to some degree, empirically tractable. That is, we can ask, e.g., what do policymakers need to know in order to realize policy objective *O*? What do they actually know? What are the possibilities in the relevant context for learning any missing knowledge required to realize *O*? What are the consequences of pursuing *O*, given the nature and extent of policymakers' ignorance? What spontaneous forces must intervene if *O* is to be realized, despite the nature and extent of policymakers' ignorance? What are the prospects in the relevant context for the intervention of these necessary spontaneous forces? The fact that I do not answer these questions in the present context should not be interpreted as ignorance of or insensitivity to them. However, in order to set about solving a problem, it must first be recognized and its significance appreciated. My goal in the present paper is merely to expose the problem and encourage further research about it.

INTRODUCTION

It may occasionally happen that the policy objectives that constituents demand are exactly the same goals at which policymakers would otherwise aim were constituents' demands immaterial, but it is naïve to think that policymaker and constituent are always *simpatico*.[3] My hope here is to clarify one of the (surely many and complex) considerations that determines the extent to which policymakers pursue the objectives demanded by constituents rather than other goals that constituents demand less, or not at all. The present note considers the relationship between the policy objectives that constituents want policymakers to pursue, the *knowledge* that policymakers either possess or can – or, more significantly, *cannot* – acquire, the various incentives policymakers confront to pursue particular objectives, and the actual objectives that policymakers ultimately pursue.[4]

ASSUMPTIONS

It is probably a typical fact of politics that there are ways for a policymaker to get what he wants – whatever this might be, public approval, popularity, praise, power, whatever – that do not require the earnest pursuit of the policy objectives demanded by his constituents. That is, in many political contexts, there are multiple ways for a policymaker to realize his preferred outcomes; one of these *could* be pursuing the policy objectives that constituents demand, but a shrewd politician might accrue the same benefits by instead, say, engaging in a public relations campaign to convince constituents either that he earnestly pursues their preferred policy objectives (while in fact pursuing others) or that they should prefer the objectives he is otherwise inclined to pursue.

I start from the assumption that policymakers know the objectives demanded by their constituents just as well as they know anything at all. By assumption, there is no unique epistemic burden involved in discovering the populace's preference ranking over policy objectives.[5] The policymaker's sole epistemic burden is confronted in discovering and effectively implementing the specific policy actions that will manifest particular objectives. Policymakers know what their constituents want as well as they know anything, but may not know how to realize related outcomes.

Of course, that policymakers know what constituents want is something of an idealized assumption. First, there is hardly any such single univocal thing as "what constituents want." The policymaker typically confronts an array of constituent demands that are in some degree of tension and cannot all be pursued at the same time for reasons metaphysical, physical, political, or economic. There is no such thing as "the populace's preference ranking over policy objectives."[6] Second, the assumption is unrealistic because extant mechanisms of political communication perform their epistemic function quite poorly. What is needed is some sort of epistemic device that conveys the demands of constituents to policymakers in an efficient fashion.

Actually though, this would solve the problem of political communication only with respect to one half of the constituent-policymaker dialogue. Efficient communication between constituents and policymakers requires epistemic mechanisms that convey both the demands of constituents to policymakers and correct information about the actual objectives that policymakers in fact pursue to constituents. Only with such mechanisms in place could policymakers acquire knowledge of the objectives that constituents want them to pursue; and only with such devices could constituents come to know that policymakers earnestly pursue these objectives, rather than merely making to appear that they do.[7] Unfortunately, as it is, both sides of this dialogue are rather weakly voiced and only ever heard through considerable noise.[8] As compared to, say, the epistemic processes of the price system (see Hayek [1945] 2014), standard voting mechanisms and other devices for expressing constituents' policy preferences (e.g., [competing] public protests, [competing] political parties, [competing] interest groups, social media) at best convey relevant knowledge to the policymaker in a limited, vague, and confounded form. Unlike price signals, such signals as are received by the policymaker from constituents concerning their policy demands express relatively little about *what to do*. On the other hand, policymakers are often sophisticated manipulators of public opinion with sizable media budgets who, with journalistic handmaidens in tow, can too easily stoke a public misimpression of their constituent-mindedness. Normal democratic mechanisms – much less whatever mechanisms might operate in non-democratic contexts – are meager epistemic devices.[9]

Suffice it to say that this idealized assumption is made for the sake of simplifying the analysis and does nothing to undermine the relevant conclusions. Indeed, as should become apparent, relaxing the assumption would strengthen my argument (at the expense of making it more complex), as the more realistic premise that policymakers in fact do confront an epistemic burden in discovering the policy preferences of their constituents makes the pursuit of constituents' preferred objectives yet less appealing than other possible pursuits, keeping other factors constant. If policymakers have to perform epistemically burdensome searches to discover the policy objectives that constituents demand, then, *ceteris paribus*, it is (epistemically) easier to pursue other objectives which do not require that such burdens be confronted.[10]

THESIS

The relevant question is, assuming that policymakers know the objectives that their constituents want them to pursue, how might their ignorance with respect to the means of realizing various potential policy objectives affect the incentives they confront to pursue particular policies and, thus, to the extent such incentives determine their actions, the policy objectives they ultimately pursue? Plainly put, assuming policymakers know what constituents want, how might ignorance of the means to realize what constituents want influence the policymaker's incentive to pursue what constituents want, other factors held constant?

Scheall, Butos, and McQuade (2018) point out that, other factors held constant, the epistemic burden of narrowly self-interested policymaking, pursuing policy goals that the policymaker takes to be in his own selfish interests, is often though not always, lower than that of broadly altruistic policymaking, i.e., pursuing objectives that the policymaker believes to be in the interests of his constituents. The epistemic burden of selfish policymaking tends to be lower than that of constituent-minded policymaking. If you like, the means to selfishness are often (not always) more easily known than the means to altruism. As they put the point, "Other things equal, the relative epistemic complications of satisfying the wishes of the public should incent more [narrowly] self-interested policymaking. We should expect to find more self-interested political behavior where (*ceteris paribus*) the epistemic burden of making effective public-minded policy is comparatively heavy" (Scheall, Butos, and McQuade 2018, p. 9, fn. 7)

This point can be generalized. *Other factors held constant, the relative weights of the epistemic burdens of competing policy objectives serve to determine the objectives that policymakers pursue*. If this is right, then, *ceteris paribus*, the policymaker is incented to pursue policy objectives that bear the lowest epistemic burden, i.e., those goals he knows or has the best prospects of learning how to realize. Other factors held constant, the policy objectives that constituents demand will be pursued only if they impose a lighter epistemic burden on policymakers than alternative policy objectives. Otherwise, the policy objectives that constituents demand will be ignored in favor of other policy pursuits (perhaps accompanied by a public pretense of the pursuit of constituents' demands). In short, the nature and extent of his ignorance of the means required to realize his constituents' demands serve to determine the extent to which the

policymaker pursues constituent-minded rather than other policy objectives. The relative epistemic burden of constituent-minded policymaking is a factor that contributes to determining how much of it we get.

This thesis bears several implications.

SOME IMPORTANT IMPLICATIONS

If the relative epistemic burden of the pursuit of the policy objectives that constituents demand is heavy relative to other potential pursuits, even where policymakers are entirely predisposed to pursue their constituents' demands, we are likely to find the pursuit of objectives other than those demanded by constituents. Where the epistemic burden of satisfying their constituents' policy demands weighs comparatively heavy, even the most constituent-minded politician by predisposition can be incented into pursuing objectives that constituents demand less or not at all. The notion that there are principled, publicly-minded policymakers who will pursue their constituents' interests come what may is terribly quaint.

However, it is also an error to assume *a priori* that policymakers are no less selfish, no more altruistic, than non-political actors. In this regard, public choice economics misplaces the cart of incentives in front of the horse of epistemics.[11] Whether and to what extent a policymaker pursues selfish or constituent-minded objectives is not some brute inexplicable fact but is partially determined by the relative epistemic burdens involved in being one rather than the other. The policymaker's incentives to selfishness rather than constituent-mindedness are partially determined by the burden involved in acquiring the knowledge necessary to realize through political action the demands of his constituents. The nature and extent of his ignorance serves to determine the incentive structure confronted by the policymaker.

The first problem of constitutional economics would seem to be less (*per se*) how to write constitutional rules that limit the negative effects of venal political behavior than how to write a constitution that limits the negative effects of policymaker ignorance, one of which is non-constituent-minded political behavior, which encompasses selfish political behavior.[12]

When seeking explanations of government's failure to satisfy constituents, one place to look is the gap separating the knowledge required to realize outcomes that constituents want and the knowledge that the policymaker possesses or can acquire. If this gap is too large, if the burden of acquiring the knowledge necessary to realize his constituents' demands is too high relative to the burden of acquiring the knowledge necessary to realize other potential objectives, then, *ceteris paribus*, the policymaker is incented to pursue the latter and neglect the former.[13]

Political epistemology is in some sense prior to political economy. The policymaker's knowledge and ignorance serve to determine what policy objectives he is incented to pursue or to not pursue, but the opposite is not true: that a policymaker is incented to some objective is irrelevant to whether he possesses or can acquire the knowledge required of its realization. Whatever incentives policymakers confront to realize world peace are grossly insufficient to its epistemic requirements. Epistemic burdens are factors in the determination of incentives, but incentives are irrelevant to epistemic burdens. In particular, that a policymaker faces an incentive to pursue some policy objective cannot lighten his epistemic load.

Indeed, political epistemology is prior to all normative political considerations, i.e., to all questions of what policies policymakers "ought" to pursue. To see this, consider the significance for both policymaking and the methodology of political inquiry of the principle that *ought implies can*.

It is generally accepted that there can be no normative obligation to pursue the impossible. Insofar as we accept this principle in everyday life, our judgments concerning what we can possibly achieve bracket the choices to which we then apply normative criteria. That is, we normally include among our options only things that we think we can do. Of course, such judgments are often made only sub-consciously. When considering various potential modes of travel, for example, no (sane) person explicitly considers attempting to fly like a bird without mechanical assistance. On some less-than-fully conscious level, we all recognize that flying like a bird without mechanical assistance is impossible and therefore irrelevant to the travel options to which normative considerations apply. If we do not think we can do something, we typically exclude it from our incentive structure. What we can do – at least, what we can do *deliberately* – depends on what we know or can learn. The array of options from which we choose is partially determined by whether we believe that we possess or can acquire adequate knowledge to realize some potential outcome. Men may do what they are incented to do, but what they are incented to do is partially determined by what they know.

Of course, there is always the possibility that some outcome might be realized, as it were, spontaneously or non-deliberately, despite the actor's ignorance. I might just run

off a cliff and find myself flying like a bird without mechanical assistance for the first time in human history—but, I do not consider this sufficient ground to include this possibility when considering the best (according to some normative criteria) mode of getting from point A to point B. We occasionally get lucky despite our ignorance, but we do not include among our options possibilities that, given the nature and extent of our ignorance, require considerable luck for their realization.

Thus, insofar as we bracket possibilities that require such luck, *ought to X implies can X, which implies knows (or can learn) enough to X*.

If the principle that ought implies can is as applicable within as outside political contexts – and one would need an independent argument to think it less pertinent in politics – then, by parity of reasoning, the same priority of epistemic over normative considerations exists in the political realm. Thus, whatever the context, political or otherwise, before we decide what we ought to do, we need to determine what we can do deliberately, which means determining what we know or can learn to do.[14, 15]

Epistemic considerations are crucial to determining what is and what is not included, and, if so, where, in a person's – in this case, a policymaker's – incentive structure. Policy objectives the realization of which require the policymaker to accept a heavy epistemic burden are likely to be either excluded altogether or deeply discounted in his incentive structure *prior* to the application of normative considerations.

In his essay "Of the Independency of Parliament" (1742), David Hume famously argued that "Political writers have established it as a maxim, that, in contriving any system of government, and fixing the several checks and controuls of the constitution, every man ought to be supposed a knave, and to have no other end, in all his actions, than private interest." If my argument here is sound, then Hume and the political writers to whom he referred misplaced the normative cart before the epistemic horse no less than their intellectual descendants in the public choice tradition. We should assume not that all men are knaves, but that all men are ignoramuses and that the extent of their knavery is in part a function of the extent of their ignorance.[16] Perhaps unfortunately, "All men are ignoramuses and, because of this, sometimes knaves too" falls from neither tongue nor pen as mellifluously as Hume's famous phrase.[17]

If we assume that all men are knaves in political affairs and should be analyzed as such, then we will be hard pressed to explain why policymakers ever earnestly pursue the objectives demanded by their constituents (to the extent that they ever do), except to say that, in the case in question, the political demands of constituents happened to align with the interests of a bunch of knaves. This is not a very satisfying explanation. Indeed, it may not be an explanation at all as it comes dangerously close to implying that bad things happen when people do bad things and good things happen when people do good things. As social scientists and political philosophers, we want an explanation of *unintended* consequences. We want to know why bad things can happen even when people do good things and *vice versa*. The public choice economist need not start from the perhaps, at least in some cases, dubious assumption that policymakers are narrowly self-interested; he can instead start from the manifest fact that policymakers are ignorant and get the same results. The analytical accomplishments of public choice economics notwithstanding, the assumption that all men are ignoramuses and, because of this, sometimes knaves too, promises to yield a richer understanding of the interrelationships between knowledge, incentives, policy pursuits, and social outcomes.

If there is anything to the present analysis, then much of what falls under the heading of political epistemology in the existing literature in fact misses the fundamental political-epistemological point. Indeed, much of this literature concerns issues that I have explicitly set aside here, namely, either the epistemic characteristics of constituents, i.e., whether voters are "wise" or "rational," or the effectiveness of the means by which knowledge of constituents' demands is conveyed to policymakers.[18]

Even were constituents maximally rational and some means for perfectly conveying their demands to policymakers discovered, the problem raised in the present paper would appear insofar as policymakers remain ignorant of the means to realize these demands. The *problem of policymaker ignorance* – the fact that what can be deliberately realized through political means is, in the final analysis, constrained by the nature and extent of policymakers' ignorance, and their capabilities for learning – is the fundamental problem of politics and of political inquiry. It is the problem that remains when all of the other problems of politics and political inquiry have been solved.

Where we observe a relatively high degree of disappointment with government, we will often find constituents demanding the pursuit of comparatively epistemically burdensome policy objectives. Under such circumstances, constituents are disappointed because they demand out-

comes from policymakers that require more knowledge than the latter either possess or can acquire.

The motivations of those who enter politics vary from one person to the next. At one extreme, there are people who enter the political arena in pursuit of personal recognition and power over their fellows. At the other extreme, there are those who enter politics with the best intentions in mind, the desire to serve the public and improve the lives of others. However, there is in any case no reason to think that these attitudes remain static over the course of political careers. Empirical observation, as well as common sense, seem to suggest a gradual tendency, frequent but by no means universal, toward a deterioration of motivations for political action over time. That which once motivated, say, the first-term congressperson often no longer moves the sixth-term congressperson. The thesis that the incentive to pursue constituent-minded rather than other policy objectives is determined by the relative epistemic burdens involved implies an explanation of this phenomenon: the wide-eyed constituent-minded idealist new to politics is eventually ground down over time by (*inter alia*) the dawning recognition of the comparatively heavy epistemic burden involved in pursuing his constituents' demands.

In general, potential policy objectives range from the unambitious and epistemically simple to the grandiose and epistemically difficult, if not impossible. Other factors held constant, we should expect to find more simplistic than more ambitious policymaking.[19] Anyone expecting policymakers to forthrightly address the world's most complex problems – especially when there are epistemically simpler options on the table, including that of merely pretending to address the world's most complex problems – is neglecting the effects of ignorance on the incentive structure confronting policymakers.[20]

There is a direct relationship between the height of political expectations and the extent of political disappointment. Put another way, there is a tension between effective government and ambitious government. A state in which policymakers are constitutionally constrained to the pursuit of goals the epistemic burden of which is relatively light is likely to be quite effective as compared to a more ambitious government in which few potential policy goals are constitutionally debarred. We can have a government that is effective in the sense that it regularly meets policy objectives or we can have a government that is ambitious in the sense that it permits the pursuit of comparatively epistemically burdensome policy objectives, but we cannot have both. Until policymakers approach omniscience and omnipotence, governments of the latter kind will always be less effective – they will tend to achieve their objectives less regularly – than will governments of the former kind.[21]

I have silently and purposely conflated these issues to this point, but we can further distinguish the consequences of *first-order* and *second-order* policymaker ignorance. A policymaker is first-order ignorant with respect to some policy objective when he lacks some of the knowledge required to deliberately realize it. Spontaneous forces are required to realize an objective with respect to which policymakers are first-order ignorant. A policymaker is second-order ignorant with respect to some policy objective when he is ignorant of his first-order epistemic condition regarding the objective.

A policymaker who is both second-order and first-order ignorant – i.e., who is ignorant of his ignorance – with respect to some policy objective is a potentially dangerous character, for he can easily fall into the trap of believing he can accomplish things through political action that he manifestly cannot. It would seem to be such characters that F.A. Hayek ([1975] 2014) had in mind when he spoke of policymakers' "Pretence of Knowledge" in his 1974 Nobel Prize Lecture.

In keeping with the analysis above, the incentive structure of a policymaker who is second-order knowledgeable about his first-order ignorance – i.e., who knows that he is ignorant – with respect to some policy objective will be partially determined by his epistemic circumstances, other factors held constant. The objective will occupy a lower place, if it appears at all, in his incentive structure than it would, *ceteris paribus*, were its epistemic burden lighter.

A policymaker who is second-order ignorant of his first-order knowledge – i.e., who mistakenly thinks he is ignorant – with respect to some policy objective will be less inclined, other factors held constant, to pursue this objective that he, in fact, knows enough to deliberately realize. The excessively epistemically humble policymaker would seem to be a rare bird, seldom observed in the wild.

Finally, a policymaker who is second-order knowledgeable about his first-order knowledge – i.e., who knows that he knows – with respect to some policy objective would seem to be something like the wise captain of the ship of state. The incentive structure of such a policymaker is unaffected by epistemic considerations. Because he is knowledgeable of the means of realizing his constituents' policy demands and knows *this*, (second-order) ignorance cannot dissuade him from their pursuit. Of course, other factors might subsequently dissuade him, but ignorance will not

be among them. However, where constituent-mindedness bears an epistemic burden over and above other potential policy pursuits, as I have suggested it often does, this counterpart of the wise captain of the ship of state would seem to be a mythical creature.

The problem of policymaker ignorance is not unique to any particular political system or party. It will appear to some extent or other wherever political representatives, whether democratically elected or not, are expected to act in the interests, and as the agents, of other people. Insofar as this condition obtains, the problem that Mises and Hayek raised for socialists (see footnote 16 above) appears even in the most liberal systems.

The central issue exposed in the present paper, namely, that the epistemic burden of some policy objective serves to determine whether and where it appears in the policymaker's incentive structure, is not unique to political contexts. It can arise elsewhere. Indeed, it is a problem that arises whenever a *proxy* acts on behalf, and presumably in the interests, of some other person. If there is a disconnect between the knowledge possessed by the proxy and the knowledge required to do the thing that the proxied demands, the problem appears, i.e., *ceteris paribus*, when considering his options, the proxy discounts or neglects altogether those options that he takes the person proxied to prefer.

The problem is common in policymaker-constituent relationships, but can arise elsewhere, e.g., in the context of corporate shareholder-voting, or doctor-patient, lawyer-client, teacher-student or, indeed, parent-child relationships.[22] In this respect, the present paper exposes some of the epistemic aspects of a very general principal-agent problem.

PARTING REFLECTIONS ON *EXPERT FAILURE* AND THE PROBLEM OF POLICYMAKER IGNORANCE

Koppl's book offers a plethora of examples of expert failure that also double as case studies of the problem of policymaker ignorance and its consequences. One need read no further than the book's introduction to learn that expert-policymaker ignorance is behind the Flint water crisis (p. 1), many of the failings of child-protective social work (pp. 2-4), the manifest deficiencies of Obamacare relative to constituents' original demands for health-care reform (p. 5), and perhaps even the Iraq War (p. 5). Donald Rumsfeld's infamous "unknown unknowns" are instances of second-order ignorance of first-order ignorance. In keeping with the analysis offered here of policymakers who are ignorant of their ignorance – mere pretenders to knowledge, as Hayek might have called them – the Iraq War (not to mention the Vietnam War that is the subject of the paper's epigraph) seems to be a paradigmatic case of the policymaker falling "into the trap of believing he can accomplish things through political action that he manifestly cannot." Similarly instructive, as Koppl (pp. 5-6) notes, is the sad and cruel history of attempts to make social policy on the basis of eugenicist theories. Though he might have, Koppl apparently did not wish to stack the deck against potential critics by invoking the name Trofim Lysenko, the infamous Soviet biologist and agronomist, whose "expertise" contributed materially to famines in both Russia and China.

Thus, the significance of *Expert Failure* for the present paper lies primarily in the empirical support the book provides to what is otherwise a conceptual argument. Wherever there is a case of expert-policymaker failure, there is an illustration of the consequences of the problem of policymaker ignorance. Closely related to this, it is also well to remember that, as noted in the second footnote above, in a world of expert failure, paying experts to contribute their opinions to the policymaking process is not necessarily a tool for the mitigation of the problem of policymaker ignorance.

The significance of the argument of my paper for *Expert Failure* is, I think, rather more complex. This topic deserves more time and space than I can dedicate to it here. Unfortunately, the following, merely suggestive and admittedly rather sketchy, comments will have to suffice for present purposes.

As noted in the last section of the present paper, the problem that ignorance affects incentives appears in all proxy relationships. What Koppl (2018, p. 189) calls the "rule of experts" – contexts in which a monopoly expert decides on behalf of a nonexpert – is essentially rule-by-proxy. Thus, if the argument of the present paper is sound, insofar as the policy objectives preferred by those proxied are epistemically burdensome, these objectives will be discounted relative to less burdensome goals in the incentive structure of the responsible monopoly expert-proxy; especially burdensome objectives are likely to not appear at all among the array of options from which the monopoly expert-proxy selects on behalf of the proxied nonexpert. Thus, under the rule of experts, the interests of constituents are prone to systematic discounting and chronic neglect.

The quasi-rule of experts (Koppl 2018, p. 194) is also rule-by-proxy. However, unlike pure expert rule, in contexts of quasi-rule, experts compete among themselves to decide on

behalf of nonexperts. Under conditions of the quasi-rule of experts, the extent to which expert-proxies pursue objectives that proxied constituents demand depends crucially on the effectiveness of those features of the competitive landscape that differentiate quasi-rule from the rule of monopoly experts. In particular, under quasi-rule, constituents can exit from policymaker relationships that they find unacceptable. Thus, given the possibility that his constituents might replace him with some other, the expert-proxy seems to have a greater incentive to act to realize constituents' demands under quasi-rule than under the rule of experts.

However, as we have seen, in the first instance, epistemic burdens serve to determine incentives. We can easily imagine epistemic circumstances in which the crucial exit option that distinguishes quasi-rule from rule of experts might fail to motivate competitive expert-proxies to pursue the policies most demanded by proxied constituents. In order to exit from a policymaker relationship, a constituent must be privy to such knowledge as might motivate him to exit. This is another way of saying that exit will not appear among a constituent's options if its epistemic burden is too high relative to that of non-exit.

The effectiveness of the exit mechanism afforded by competition requires that policymakers know what constituents want and that constituents, in turn, know what policymakers in fact pursue, as well as how far, and at what cost, policymakers realize what they pursue (see footnote 7 above). Where these conditions do not obtain – where policymakers confront a relative epistemic burden in discovering their constituents' demands, or constituents cannot tell how far their demands are pursued or determine the cost at which their demands are realized to the extent that they are, the greater incentive that policymakers feel to pursue their constituents' policy demands under quasi-rule in virtue of the exit option may well vanish. An expert-proxy under quasi-rule who knows his own preferred objectives, but faces an epistemic burden in discovering the policy demands of his proxied constituents, and who, moreover, knows that his constituents can neither distinguish an earnest from a merely pretended pursuit of their demands nor easily check on the extent and cost of their realization, is not obviously more incented to pursue his constituents' policy demands than the monopoly expert-proxy under the rule of experts. Thus, whether quasi-rule is likely to improve upon the rule of monopoly expert-proxies with respect to the pursuit of policy objectives most demanded by proxied constituents will depend crucially on empirical considerations concerning the epistemic features of the policymaking environment.

Given that there are no relevant proxy relationships involved, I have little to say about those contexts that Koppl dubs expert-dependent choice and self-rule, where nonexperts decide for themselves, albeit perhaps on the basis of expert advice. Of course, it should perhaps be emphasized again that every objective, political or otherwise, can be deliberately realized without the intervention of spontaneous forces only if the knowledge upon which a plan of action for its realization is adequate to the task; and, thus, that the problem of policymaker ignorance cannot necessarily be avoided by making the policymaker and the constituent the same person.

Finally, I will close by noting that the argument of the present paper seems to suggest a limitation on the possibility for competition among experts. If I am correct that ignorance serves to determine incentives, then, other things equal, we should expect to find fewer experts with regard to relatively epistemically burdensome topics and more experts regarding topics with respect to which adequate knowledge is more easily acquired. This explains why there are many experts on flying an airplane, but few experts on flying like a bird, many experts on extending your golf swing, but few experts on extending your height. If this is right, then the potential for expert competition would seem to be greatest where competition is least required, i.e, with regard to the simplest topics, and *vice versa*, the potential for expert competition might be least where it is most needed, i.e., with regard to difficult topics. In effect, for many people, the epistemic burdens of especially difficult topics seem likely to act as barriers to entering the market for experts about these topics.

The research contained in the present paper was supported by a grant from the Charles Koch Foundation.

NOTES

1. In order to avoid confusion, it should be emphasized that nothing in the present paper hinges on the presence of experts in the policymaking process. The paper was not originally written with either expert-policymakers *per se* or Koppl's (2018) Expert Failure foremost in mind. The class of policymakers that is the subject of the present paper is both broader and narrower than the class of experts that is the subject of Expert Failure. For Koppl (2018, p. 8), an "expert" is anyone paid for their opinion, whether or not as a contribution to the policymaking process. My "policymaker" includes not only experts paid to contribute their opinions to the policymaking process, but also nonexpert-policymakers (see footnote 3 below for the relevant definition of policymaker) and excludes paid experts outside the policymaking process.

   The argument of the present paper is meant to be fully general with regard to political systems. It is meant to apply both to policymakers in so-called "administrative states" (Koppl 2018, p. 13) ruled by experts – the "knowledge class" that supposedly knows not only "what is best for the people" (Hamburger 2014, p. 495), but also how to achieve it – as well as to policymakers in other contexts, where the influence of paid experts might be more limited.
2. The presence of paid experts in a policymaking process would seem to be an implicit response to the problem of nonexpert-policymaker ignorance, meant to mitigate the fact that the knowledge of nonexpert-policymakers is often inadequate to the policy objectives they are tasked with realizing. That is, experts are paid to contribute their opinions to the policymaking process because the problem of nonexpert-policymaker ignorance is real. If this is right, then insofar as expert-policymakers fail, the problem of policymaker ignorance is not mitigated.
3. I mean to be neutral regarding the mechanism whereby policymakers attain their positions. In particular, there is no assumption that they are (or are not) democratically elected. Rather, the crucial premise concerning the political system assumed in the paper is merely that constituents widely (though not necessarily universally) believe that the policymaker's proper business is the pursuit of his constituents' interests, just as constituents in our modern world, where even monarchical governments are typically expected to respect republican principles, widely (though not universally) believe that policymakers should pursue their constituents' interests. This is not to say that constituents in the model are as naïve as to think that policymakers always (or even ever) pursue their constituents' interests, just that constituents broadly agree that policymakers ought to pursue their constituents' interests.

   For present purposes, a "policymaker" is anyone directly involved in the design, determination, implementation, and administration of government policy. The term encompasses any so-called experts involved in the design of policy, as well as the government officials who decide policy, and the bureaucrats who implement and administer policy. A "constituent" is a member of the class of persons whose interests, on this way of conceiving the proper business of political action, should figure foremost in the policymaker's political-decision calculus.
4. I use the word "knowledge" in a broad sense to encompass both propositional and non-propositional knowledge, or what epistemologists call both *knowledge-that* and *knowledge-how* (Ryle [1946] 1971). Moreover, knowledge need not be conscious, but might be merely *tacit* (Polanyi 1966), i.e., knowledge of which we are not "explicitly aware," but that we "merely manifest...in the discriminations which we perform" (Hayek [1952] 2017, p. 152).
5. The *epistemic burden* of some objective is simply everything that the actor must know (that and how), which the actor does not already know, in order to realize the objective deliberately as a result of related actions directed to its realization, i.e., not spontaneously, or otherwise in virtue of luck or fortune. Epistemic burdens are thus relative to both knowers and their potential objectives. Epistemic burdens are always relative to some actor with respect to some goal.

   The present argument assumes that actors can evaluate their epistemic burdens with regard to various objectives with some facility, but not necessarily infallibly. Thus, epistemic burdens encompass both "known unknowns," i.e., considerations that the actor knows he does not know, and "unknown unknowns" that the actor cannot evaluate in advance of action.

   Epistemic burdens should not be conflated with epistemic costs. Rather, epistemic costs are incurred in the process of attempting to overcome epistemic burdens. Indeed, epistemic costs need not track epistemic burdens very closely. Just as one might climb a mountain of a given height in a more or less circuitous fashion and incur greater or lesser physical costs in the process, there can be more or less epistemically costly ways in which a given epistemic burden might be met.

Many thanks to Bill Butos for helping me better understand the nature of epistemic burdens.

6. For a mathematical proof of a closely-related thesis, see Arrow (1950).
7. In a perfect world, we would probably also have an epistemic mechanism that conveyed accurate knowledge not merely about the extent to which policymakers pursued, but also realized and at what cost, constituents' preferred policy objectives. See Wolf (1979, p. 114): "To monitor output quality requires precise, representative, and regularized feedback which is hard to realize for nonmarket output. Congressional committees, the Congressional Budget Office, ombudsmen, consumer groups, voter and consumer surveys, and other 'watchdog' devices help, but their separate and collective effectiveness in monitoring output quality inspires only limited confidence."
8. Related to this, see Arnold (1990, pp. 44-51) on what is required for a policy action to be "traceable" to a policymaker and how the absence of these requirements in democratic contexts can undermine the retrospective voting rule, i.e., the "incumbent performance rule," according to which constituents evaluate incumbent policymakers and vote accordingly on the basis of the perceived effectiveness of a policymaker's past policy actions.
9. This meagerness is analyzed adroitly by DeCanio (2014).
10. DeCanio (2014, p. 639) makes a similar assumption for similar reasons and to the same effect.
11. On the standard assumptions of public choice analysis, see Dunleavy (1991, pp. 3-4).
12. Of course, the constitution-maker, no less than the constitution-bound policymaker, confronts an epistemic burden in discovering the means by which this end might be achieved that affects his incentive to pursue it. For an argument that the very project of designing an effective constitution is ill-founded (an argument with which I am sympathetic), see Devins, Koppl, et al., 2015.
13. In reviewing Schuck's (2014, p. 150) discussion of Charles Wolf's (1979) "Theory of Nonmarket Failure," Levy and Peart (2015, p. 669) write that "Perhaps a policy fails because it fails to align the private goals of acting individuals who administer the policy and those in the collective polity who establish the administrating agencies on the basis of an articulation of public goals. Economists typically take Wolf's 'public' goals as motivational forces, whereas they may neglect important private goals that counteract or confound the so-called 'public' goals." In effect, part of what I am arguing here is that in order to ensure that "public" and private goals align, the epistemic burden of realizing the first category of goals cannot greatly exceed that of the second. The extent to which "public" goals act as motivational forces is partially determined by the relevant knowledge that policymakers possess or can acquire.

    By "private" goals, it should be noted that Wolf (1979, p. 116; italics in the original) meant "'internalities': The goals that apply within nonmarket organizations to guide, regulate, and evaluate agency performance and the performance of agency personnel […] nonmarket agencies often develop internalities that do not bear a very clear or reliable connection with the ostensible public purpose which the agencies were intended to serve." The argument is not materially affected if the range of "private" goals is expanded to include, in addition to such "internalities," policy objectives that constituents demand relatively less than other potential policy objectives.
14. The main point does not ultimately hinge on acceptance of the principle that ought implies can, which, though widely accepted, is not without controversy. One might think that a logical connection weaker than implication obtains between normative and epistemic considerations, and still agree that the normative force of policy objectives about which policymakers are ignorant is relatively weak.
15. DeCanio (2014, p. 639) "examines specific problems associated with knowledge, democracy, and the market and presents a method for mitigating the effects of ignorance on human affairs." However, DeCanio misses the fundamental issue concerning knowledge and politics. Granting his explicit argument for his method for mitigating the effects of ignorance, do policymakers possess, or can they acquire, the knowledge required to effectively implement the method? Other factors held constant, if the epistemic burden of DeCanio's method is too high, or seems to require greater luck, as compared to some other method of mitigating the effects of ignorance – in short, if it is to ignorance-mitigation what flying like a bird is to human travel – DeCanio's method will not even figure among the options to which policymakers apply normative considerations. DeCanio (2014, p. 643) notes correctly that knowledge problems do not depend on incentive structures but fails to notice that the opposite is in fact true: the nature and extent of our ignorance serves to determine what we are incented to do and, more importantly, to not do.
16. This is a fact that authors in the Austrian economic tradition have always understood (see Leeson and Subrick 2006, p. 109, and Boettke 2018, p. 945). In their various attacks on the feasibility of socialism, neither Ludwig von Mises (1920) nor F.A. Hayek ([1935] 1997a, [1935] 1997b, [1940] 1997) assumed that socialist administrators were knaves. Rather, their respective socialist calculation arguments started from the

premise that such administrators were purely constituent-minded and knowledgeable about the central plan, i.e., the relevant set of policy objectives, that constituents demand. Both appreciated that there would be practical difficulties involved in coming to such agreement, but this was not the central point of either of their critiques. Similarly, Hayek's ([1975] 2014) "Pretence of Knowledge" argument against the effectiveness of countercyclical policymaking assumed that policymakers aim always and only at effective macroeconomic management. The problem, Mises and Hayek argued, is that an insurmountable knowledge problem remains even if such assumptions are granted. Good intentions and knowledge of the desired policy objective are insufficient to ensure the realization of a well-intentioned plan. The socialist administrator still requires knowledge of the *means* by which the plan can be realized, and this requires knowledge, i.e., of what Hayek ([1945] 2014) called "the particular circumstances of time and place," that extends beyond the policymaker's capabilities. Indeed, according to Hayek ([1968] 2014), such knowledge simply does not exist outside of market contexts.

For an argument from outside the Austrian economic tradition that similarly emphasizes the policymaker's epistemic difficulties *given* their moral probity, see Friedman (1947).

17. David Hume is my favorite writer of all time, so I am pained to present this critique. I prefer to think that Hume was not wrong on this point as much as he simply forgot to fully follow the principles of his epistemological skepticism, as applied to the realm of politics, through to their ultimate consequences.
18. See, e.g., Landemore (2012), the essays collected in Friedman (2014), and Brennan (2016).
19. One might be inclined to think that the *ceteris paribus* assumption is carrying too much of the weight of the argument of the paper. There are a number of things to say against this initially plausible objection. First, the present paper is meant to be the initial contribution to a research program focused on the implications of a seemingly important, but heretofore largely neglected, problem, namely, the problem of policymaker ignorance. The relevant assumptions should certainly be loosened at some point in the development of this research program, but there can be no obligation to complete the research program in its initial statement. Second, for reasons similar to those given above concerning the consequences of the more realistic assumption that policymakers do confront an additional epistemic burden in discovering the policy demands of their constituents, loosening the *ceteris paribus* assumption would seemingly complicate the analysis for both analyst and analysand. That is, the policymaker in a world in which all other relevant factors are not being artificially held constant does not necessarily because of this confront a less epistemically burdensome environment. *A priori* of the development of the relevant research program, there is little reason to think that loosening the *ceteris paribus* assumption would necessarily undermine, rather than bolster, the current argument.
20. A previous reviewer objected that the paper "provides no evidence that policymakers know which policies are epistemically demanding. Without this knowledge, epistemic demandingness could not affect incentives in the way you posit." If I understand this objection, it seems to assume a conception of knowledge as infallible, but this is no part of my understanding of knowledge (see footnote 5 above concerning the fallibility of evaluations of epistemic burdens). The relevant evidence that policymakers have some, albeit fallible, knowledge of what the reviewer calls "epistemic demandingness" is simply the knowledge that each of us possesses of our own capacity to evaluate with some, albeit fallible, facility the nature and extent of our ignorance concerning the means to realize various ends, coupled with the plausible assumption that policymakers are similarly capable.

    The same reviewer further objected that "if we look around at politics, do we find [policymakers] reluctant to take on monumentally difficult tasks like restructuring the entire health-care system or the entire banking system? No, I don't think that we do. On the contrary, we find policymakers eager to undertake such tasks. Presumably this is because they are confident that they know what they need to know about these matters. If they are *over*confident, they don't recognize it. That is, they are unknowingly ignorant. Your argument would apply to reality only if they were *knowingly* ignorant."

    This objection begs the question against me. In particular, the reviewer assumes without argument or evidence that the policy measures taken to restructure "the entire health-care system [and] the entire banking system"—presumably, the reviewer refers to the various policies along these lines made by American policymakers during the Obama administration—were instances of policymakers earnestly pursuing the demands of their constituents, rather than, as I would classify them, public relations efforts by policymakers to convince constituents that their demands were being pursued.

    I do not recall there being a consensus among constituents for either of the relevant policies referred to here. In-

deed, it seems that the policies that were ultimately enacted were significant comedowns from what constituents in fact demanded in each case. If memory serves, what constituents wanted in each case was a policy objective more epistemically burdensome than could ever have been realized by the policies that were ultimately made. What constituents really wanted was the realization of a policy objective that was epistemically gargantuan, if not plainly impossible. To the extent that there was a consensus among constituents regarding health-care reform, it was for the quite epistemically burdensome—indeed, perhaps epistemically impossible—objective of a health-care system both more expansive, in the sense of covering more of the population, and less costly to both individuals and the country as a whole. Similarly, insofar as there was a consensus among constituents regarding banking reform, it was for the epistemically heavy, if not impossible, goal of a system immune at least to financial crises and, ideally, to sudden economic fluctuations as well. Whatever else might be said for or against them, the relevant policies that were ultimately made, it seems to me, aimed at less ambitious objectives than those the realization of which constituents most demanded. That is, in keeping with my analysis, when confronted with demands for solutions to some of America's most complex problems, policymakers ultimately did *something else*. These cases are instances of, not counterexamples to, the argument of the present essay.

21. Note that my criterion of policy effectiveness is more modest than some alternatives that might be preferable on independent grounds. Schuck (2014, p. 41), e.g., argues that determining whether a policy is effective is a matter of deciding whether its "benefits exceed its costs and whether it is cost-effective."
22. Many thanks to Parker Crutchfield for helping me see some of the other contexts in which the problem appears.

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Massive Error

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Roger Koppl's book points to the big conundrum in dealing with expertise: what can we say about massive expert error? With individual errors, we can use the conventional, consensus, standards to judge something to be erroneous, knowing that the conventional standards may be wrong. We can poll experts. We can wait for claims to be refuted, and for the refutation to be generally accepted. Or we can wait for history to show that the consensus was wrong—perhaps a very long wait. Or we can make a personal judgment, against the consensus. There might be many grounds for doing so, involving something we know or think we know, either about the subject matter or about the mode in which it was produced, which we may regard as flawed. Massive error is more difficult to handle. Some of the same considerations apply, but in a more problematic way. In the case of massive error, we can't consult the consensus, or the conventional standards, because they are going to be part of the error. We can't say the mode of production was problematic unless we have some idea of what the right mode is.

Koppl provides a kind of model of the circumstances in which expert error is likely to be reduced, and, on the other side, an account of the dangers of certain kinds of institutional arrangements that elevate the possibility of error. The model of the best circumstances has some characteristics of an open market; the worst has characteristics of markets that are closed because there is only one seller or buyer, or which has insurmountable barriers to entry. This is a model with clear antecedents in Michael Polanyi ([1951] 1980, pp. 32-48, 49-67; Turner 2005), who stressed the importance of scientists having powers of autonomous decision-making about what topics, methods, and lines of inquiry to pursue. So it is instructive to think about some of the issues with this account, and some of the problems with assessing what actually happened. Polanyi's model was one in which all qualified investigators would receive support, but without direction, so that they are allowed to follow their best scientific instincts.

Polanyi ignored rewards, the problem of recognition of achievements—which Polanyi was nevertheless aware of—and the problem of deciding who was qualified. His policy was nevertheless grounded in experience, Polanyi's own experience in running a Kaiser Wilhelm Gesellschaft lab in Germany in the 1930s, and his later experience in Manchester, where the university itself provided support. It was precisely this model that was obliterated in the post-war period by the rise of big science and the predominance of the project grant system. This made "autonomy" into a fiction, a fiction that had to be maintained by beliefs along the lines that funding and other academic decisions were based solely on merit, omniscience about the future pay-offs of research, and so forth—that the omnipresent decision-making that goes on in every nook and cranny of science had no effect on the content of science or the path that scientific discovery took.

In Koppl's terms, the restriction to qualified investigators is a barrier to entry. The selective allocation of funds, similarly, is a barrier to entry for those who were not given funds. Polanyi struggled to find a way to explain the role of granting agencies—at which involved what he called the Influentials ([1951] 1980, p. 54). But unless the Influentials are doing what the market would do, which is to say serve as something like the omniscient planners of socialist theory, even if they limit their role to talent-spotting, their existence undermines the market analogy. Moreover, we know that the decision makers are not omniscient planners. Bernard Lovell, the radio-astronomer and Nobel Laureate, campaigned against funding for DNA research, because he thought it was oversold and not as important as his own work. Conflicts of interest and patches of simple ignorance abound in these decision-making processes. Even talent-spotting is subject to these issues. This is a good reason not to intervene, as Polanyi understood. But it is not clear that the problems of decision-making are better resolved by creating one big barrier to entry, the barrier of becoming a "qualified" scientist, rather than having every idea subject to peer-review and the deliberations of a grant-making committee.

The idea of barriers to entry is a nicely general concept, which obviously applies far beyond examples like the Polanyian approach to the organization of science. And it has special relevance to expertise, because it is difficult to separate from the concept of expertise itself: if there are no barriers to calling oneself an expert, if anyone who can get someone to pay for an opinion is an expert, one wonders how the putative expert is selling his or her opinion? Koppl's example of forensics, it is true, does provide an extreme case of salesmanship. I recall passing the door of a lawyer's office in Miami years ago, and seeing a cascade of flyers and cards on the floor. Curious, I looked down to see what they were. They were advertisements for expert witness services. So this really looked like a market. But even here the sales pitch included qualifications. This may only have been relevant because qualifications made the expert a more persuasive witness. But they were part of the marketing process, and no accident.

Qualifications have a Janus faced character. The lack of a given qualification is a barrier to entry. But the possession of a qualification is a kind of certification that the market finds desirable. This is the phenomenon I tried to account for in "Scientists as Agents" (2002). It was inspired by another pile—of documents found outside a door, in this case a door of a hotel conference room. The room had evidently been occupied by a grant or hiring committee in the area of medical research. The documents were vitae of applicants. I glanced at them out of curiosity, and was astonished at one feature: most of them listed a full page or more of prizes. These began as early as third grade science fair prizes. My question: why were there so many prizes in medical science?

Prizes aren't like one-shot certifications. But they too serve to certify. And indeed, the articles listed in the rest of the vitae, along with the degrees and other qualifications, also represented certifications. They were each the product of some sort of evaluative process in which someone blessed the person or what the person produced. And they have value. Not as much value as a Nobel Prize, which Paula Stephan and Sharon Levin have quantified (1993), but enough value to put on a vita. Now things get interesting: if it has value, a market can't be far behind. And indeed, prize givers, degree givers, article accepters, letter of recommendation writers, and so on and so forth, are all competing in some sort of market in which their product has a value relative to the other products, to other certifications. They may not be paid for their opinion directly, but they are paid indirectly in various ways. So they are experts, by Koppl's definition. But they are second order experts, certifiers of the expertise of others.

Why is there so much demand for this kind of certification? For the same reason that we want our termite killing service to be certified: there is a principle-agent problem of trust, and we will pay, or make sacrifices, to diminish. And there are people who will come up with a certifying product—a seal of approval. Koppl cites but does not quote the Granny in the supposed exchange with Bertrand Russell, who says, "It's all rubbish! The world is flat and rests on the back of a turtle!" when Russell says, "If that is so, what does the turtle stand on?" the granny says, "You can't fool me, sonny, it's turtles all the way down!" With this we can go full Austrian and say that it is markets for opinions, including opinions about opinions, all the way down, or at least until the costs of going to the next turtle down exceeds the benefits—in our opinion.

But there is a problem with the market analogy, which Koppl is very sensitive to. Opinions are not, like commodities, more or less discrete and independent dry goods, made by independent and competing producers. They depend on a division of knowledge and "knowledge labor," or discoveries and ideas that are communicated. Things may be only partially understood outside the narrow limits of certain roles in the division of knowledge. But this knowledge, acquired second hand, is the basis of opinion. In a certain sense, scientific knowledge at least is "collective" or at least distributed and held by no one in the sense that there is someone who possesses all of it. There is a communal character to scientific knowledge that is antithetical to the market analogy.

In contrast to the image of the autonomous scientist, this dependence on others is pervasive, because massive ignorance is the basic condition of all scientific inquirers (Schwartz 2008). Only a small domain of specialized knowledge can ever be fully accessed by any individual. The beliefs on which they depend, and which are the basis of their opinions come from elsewhere in the division of knowledge, and are normally only very imperfectly assimilated, more or less on a need to use basis. What about raw "evidence"? Evidence is the basis for inferences that themselves, for any meaningful purpose, depend on opinions—about what the right methods are, about what should count as evidence, and so forth. And in most domains this depends on tacit knowledge acquired by personal contact, meaning that a division of labor is being mapped on to the division of knowledge.

All this is banal, and Koppl gives a much more elaborate account of these considerations, which I will not repeat here. He suggests some ways in which they become a problem, for example in the entangled state, where authority, expertise, politics, and mix. He also gives the example of the Flexner report (Brown 1979). This is a crucial example, for the simple reason that the pattern of institutional development that Flexner pioneered for medicine in the US was applied elsewhere (famously to China[1]) and more importantly to other fields (Buxton and Turner 1992), thus creating a template for the categories of expert and professional themselves. Why did this anti-market template get applied so widely?

A brief history of this template and its applications are useful here. One example is particularly relevant. Charles Merriam, the powerful advisor for social science to the Laura Spelman Rockefeller Memorial/Rockefeller Foundation, did the same thing Flexner did for Medicine, but for public administration.[2] The template was the same—certification, professional education, continuing education, connection to a university as well as an ongoing process of doing research (complete with an academic discipline and hierarchy) and training people in light of the findings, and creating a hierarchy from experts to practitioners. This was the opposite of spontaneous order: it was instead the self-conscious creation of an order, with experts buttressed and confirmed by an institutional structure, with incentives for following the experts, and with barriers to entry that provided advantages for those who were licensed or certified, and so forth.

So why did this happen, and why did the template succeed so well that "professionalization" became a major theme of the twentieth century, and sociologists began to talk about "the professionalization of everyone" (Wilensky 1964). We can get some "market" answers by looking at these two cases: real estate and public administration. In the real estate case, there were always market alternatives—"for sale by owner," having a lawyer handle the transaction, and so forth. As Koppl notes, market barriers lead to exclusions that are unrelated to value: this was especially evident with real estate. When real estate professionalized and created the category of Realtors, in a process led by none other than Richard T. Ely (Malpezzi 2009, pp. 2, 5-7, 10-12, 22), it involved race. And this produced a response: Black real estate agents created their own certification and professional body in 1947, which pursued different policy aims, and called themselves "Realtists."[3] In the public administration case it was a matter of public choice: cities chose democratically to be professionally administered rather than leave decisions to politics or hand out positions to political appointees. State agencies, for their own reasons, used certifications as job requirements. And there was entanglement with the state. In many places there was a state associated training and continuing education program, and therefore a de facto monopoly.

Flexner may have created the model, but clearly there was a big market for expertise organized according to the template. There were obviously many reasons for this, but trust was one of them: if you need a service and lack the knowledge to find the right person or method, or there are other complications, going for the standard certified model is a safe bet. One might think of it this way: people want experts who are certified, but they also want choice; experts in organized bodies, not surprisingly, want to exclude "fake" experts from competition, and create a monopoly, at least of certification, the effect of which, together with the forms of discipline that go along with certification, is intellectual uniformity. But of course this is a recipe for massive error. The exact same mechanisms for creating some sort of uniform expertise, which are incentives, sanctions, acts of authority, hierarchical forms of education, and so forth, are of course contrary to the mythic idea of autonomous agents making epistemic choices that Polanyi clung to.

So while these structures create intellectual authority, or expertise, they also create the conditions for massive expert error. Is this just a chimera? Is it so rare that it can be ignored, or that we can adopt the heuristic of deferring to "scientific consensus" as the best even if not correct opinion? Of course, we cannot escape the turtles problem: in every case of massive error we can only appeal to more opinion. We can find plenty of cases where opinions change, and the original opinion comes to be regarded universally as error. And we can see some patterns here.

One is this. There are no expert solutions to many of the problems which experts are called upon for expert opinions. The demand for expertise far outstrips the expertise available. So there is a big gap between what buyers want and what sellers can provide. Mental health issues provide numerous examples: people are desperate for answers and help. Autism has long had history of expert failure, from the notorious case of Bruno Bettleheim to the present overuse of the diagnosis. Similarly, Jerome Kagan has recently denounced the ADHD diagnosis (2012), saying it has largely been invented by drug companies. Yet an army of experts, clinicians, and educators are devoted to it, not to mention the parents who are eager for "solutions." The list of failure

could go on. Education reform has been on the public agenda for more than a century. Educational research, as Ellen Condliffe Lagemann has shown, has been a succession of fads (Lagemann 2000). This gap never closed.

Normal academic research, research not driven by a willing buyer with a policy agenda, is not exempt from these problems. As Richard Horton, editor-in-chief of *The Lancet*, writes,

> [M]uch of the scientific literature, perhaps half, may simply be untrue. Afflicted by studies with small sample sizes, tiny effects, invalid exploratory analyses, and flagrant conflicts of interest, together with an obsession for pursuing fashionable trends of dubious importance, science has taken a turn towards darkness. (2015, p. 1380)

Horton adds a comment about markets: "Can bad scientific practices be fixed?" Not without changing the market. "Part of the problem is that no one is incentivised to be right. Instead, scientists are incentivised to be productive and innovative" (2015, p. 1380).

One facilitator of this turn to darkness has been the abuse of statistics, acknowledged by the American Statistical Association (Wasserstein and Lazar 2016—and publicized in recent discussions of p-hacking and in connection with the reproducibility crisis. The issues are very basic. P values are conventionally used to certify a research finding as a fact. This convention, and its abuse, is a major source of the reproducibility crisis in psychology. A recent suggestion (Benjamin et al. 2018) to raise the level of significance from 0.05 to 0.005 would cause whole fields to come close to disappearing—and this would certainly include the fields of evidence-based policy. And the p-value issue just scratches the surface of the problems, which extend to virtually every area in which statistics are used, and in which the small manipulation of assumptions can produce radically different results.

One such problem is this: research subjects and goals are not randomly distributed. People are looking for and attempting to establish particular results. As John Iaonnidis has pointed out, the effect of this is to make the expert consensus little more than a measure of bias (2005). And obviously this bias is often politically motivated bias. The existence of this kind of bias, which often occurs when topics are intentionally under-researched, is admitted even by Brookings, whose reputation for impartiality is itself questionable.

> Psychologists, sociologists, and educational researchers have devoted far less attention to the black-white test score gap over the past quarter-century than they should have. Cowed by the hostile reaction to Daniel Patrick Moynihan's 1965 report on the status of the black family and to Arthur Jensen's 1969 article arguing that racial differences in test performance were likely to be partly innate, most social scientists have chosen safer topics and hoped the problem would go away. (Jencks and Phillips 1998)

There are many other topics that are no-go zones. And there is even a philosophical literature defending the practice of avoiding research on topics that lead in the wrong political direction (Kitcher, 2000, pp. 193-97). This kind of politically motivated sefl-censorship more or less assures that there will be massive error.

Koppl doesn't have a solution to the problem of massive error, and neither do I. "Error" is a problematic notion in this context, because judgments about error also rests, so to speak, on turtles that go all the way down. There is no perch outside of opinion on which we can rest our judgments. It is, as Michael Oakeshott would say, platforms, that go all the way down (1975, pp. 9, 27, 34). Our beliefs about the world rest on research that relies on experimental and statistical conventions. These in turn rest on other opinions, other consensuses. What we take to be true about the world depends on what someone decided to fund. The science, and the expertise we have, is the product of "the world," but it is the world as disclosed by past decisions to disclose it and disclose it in a particular way. The "ways" are necessarily limited in ways that are unknown to us. The path we took could have been different. And had we taken a different path, we might have been in a position to see what the limitations of the path we took were. If we did not invest in that path, we might not ever be in that position. It is pleasing to think that the truth will out, eventually. But turtles can live a long time. And science is as entangled in problematic decision processes as the state.

NOTES

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3 NAREB Realtist. http://www.nareb.com/faq/what-is-a-realtist/

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Arrogance and Humility in the Governance of Human Interaction: A Reflection on Roger Koppl's *Expert Failure*

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Prevailing ideology holds that democracy is a system of government where people govern themselves. This ideology clashes with the unavoidable recognition that in any but small towns and villages governance is an activity wherein a few govern and the many are governed. This situation is an unavoidable feature of contemporary life with its elaborate and complex division of labor and knowledge. All of us are in the position of knowing a lot about a few things and little about most things. The central question Roger Koppl raises in *Expert Failure* is whether experts employ their expertise to the advantage of the general public or to the expert's own advantage. Koppl advances strong reasons for being suspicious about the influence that experts exercise over the social organization of economic activity. In doing so, he brings us face-to-face with a perplexing conundrum: experts are indispensable, and yet operate within an environment that enables their biased use of that expertise.

Are ordinary people subordinate and subservient to experts, or are experts the servants of ordinary people? This is a significant and challenging question to pose because there is no simple recipe for making servants out of self-identified experts. Koppl closes *Expert Failure* by noting that his "fondest hope for this volume is that it may help induce the reader to value expertise, but fear expert power" (p. 237). In this essay I explore some insights that economic theory and political economy might offer into the social organization of what is unavoidably expert-dominated patterns of governance. I do so by taking recourse to three scholarly giants from the first half of the 20th century: Friedrich Hayek, Frank Knight, and Vilfredo Pareto. None of these figures would have thought it easy to accomplish this transformation, but they provided illuminating instruction about the difficult challenge of harnessing experts to the service of ordinary people. In short, experts might be harnessed within the confines of the theory of a free-market economy, only a free-market economy seems to lack robustness against the autonomy of the political within society (Schmitt 1932 [1996].

FRIEDRICH HAYEK AND THE USE OF KNOWLEDGE IN MARKET INTERACTION

In two well received but also widely misunderstood essays, Friedrich Hayek (1937, 1945) challenged economists to rethink their presumptions about markets and knowledge. At the time Hayek wrote, economic theory was dominated by general equilibrium theory. To be sure, that theory had changed dramatically between its initial 1874 formulation by Leon Walras and its reformulation in the 1930s in Vienna, as Roy Weintraub (1993) illuminates lucidly. The challenge the equilibrium theorists posed to themselves was to articulate a set of conditions under which it could be demonstrated that a competitive equilibrium existed. The theorists of the time regarded this as a significant demonstration because it meant that there would be no governmental action that would improve the well-being of some people without lowering the well-being of other people. All gains from trade among the relevant set of people would have been fully exploited, meaning that the equilibrium position entailed perfect efficiency.

To be sure, this claim of perfect efficiency did not imply that governmental intervention into the economy could not be justified. It meant only that such intervention could not be justified as being necessary to capture unexploited gains from trade. Intervention could still be justified by invoking normative presuppositions that looked elsewhere than to unexploited gains from trade. Gains from trade are always relative to some initial point of departure: given that point of departure, a resulting pattern of trade exploits fully the gains from trade that were inherent in that initial position. All the same, a different point of departure could have required a different pattern of trades to fully exploit the gains that were inherent in that alternative initial position. Hence,

the theorists of the time recognized that a competitive equilibrium would entail full exploitation of gains from trade, while recognizing that such full exploitation was relative to the point of departure, and that governmental power could potentially be deployed to change that point of departure by imposing some pattern of lump sum taxes and transfers.

Hayek (1937, 1945) recognized that this scheme of general equilibrium theorizing operated by assuming people knew things they were incapable of knowing. The standard theory of competitive equilibrium operated by making such assumptions as universal price taking and full knowledge. Universal price taking meant that each supplier of a product supplied an insignificant share of the total market, rendering it reasonable to assume that no seller could influence the equilibrium price by expanding or contracting production. Full knowledge meant that buyers know the prices and also product qualities that all sellers offer, meaning that sellers who charge higher prices will sell nothing. While the general equilibrium theorists demonstrated that it was possible to stipulate a set of conditions under which a full exploitation of postulated gains from trade could be achieved, it was also generally recognized that those conditions were a limiting case that enabled creation of a theoretical result without illuminating the world of practical action. The theory was an imaginative construction, as all theories must be, but it was a construction that was never thought to describe practice even remotely, but rather was thought to explain how the world of practice could not fit the necessary conditions for competitive equilibrium.

In contrast to the general equilibrium theorists with their mathematically-governed formulations, Hayek sought to articulate an alternative point of departure for economic theory. He did not stipulate conditions under which postulated gains from trade would be fully exploited. Hayek did not start from presumptions about systemic equilibrium and ask under what formal conditions such an equilibrium would be consistent with the presumptions of individual rationality. To the contrary, Hayek started with individuals who faced problems in their fields of action. Individuals who operated businesses would face problems of organizing their activities efficiently and would have to engage continually in discovering and assembling knowledge, and with some people being more successful than others. Within this market process, people would bear the value consequences of their actions. Relevant knowledge did not exist as part of the stipulation of equilibrium conditions. To the contrary, the knowledge relevant for economic activity emerged through the transactions in which people engaged. Within Hayek's vision of the economic process, gains from trade were invariably present, but these had to be discovered and exploited through economizing action. Hayek's world was one of divided and distributed knowledge, and the market process was a social process that tended to enlist those experts who knew things in the service of those who did not because doing that was the path to commercial success.

FRANK KNIGHT AND THE USE OF KNOWLEDGE IN DEMOCRATIC INTERACTION

Frank Knight was known among students during his time at the University of Chicago for declaring that to declare a situation hopeless is equivalent to calling it ideal, and with James Buchanan often repeating Knight's declaration. People are typically disturbed when they first hear Knight's declaration, but quickly come to see Knight's logic, which entails a lesson in the principle of opportunity cost, a lesson that is also encapsulated in Reinhold Niebuhr's oft-cited Serenity Prayer: "God, grant me the serenity to accept the things I cannot change, courage to change the things I can, and wisdom to know the difference." A hopeless situation cannot be changed, an ideal situation is one someone would want to maintain, so a hopeless situation is equivalent to an ideal situation in that it is senseless to try to change what can't be changed. In the contemporary world of an extensive division of labor and knowledge, there is no option to operating within an environment in which we know nothing or next to nothing about most matters that are important to us. We are dependent on experts, for better or for worse.

Frank Knight's (1960) set of lectures on *Intelligence and Democratic Action* provides a nice complement to Hayek (1937, 1945). Where Hayek probed an alternative analytical framework where knowledge was generated through market interaction and not stipulated in advance by a theorist, Knight similarly recognized that democratic processes were intimately engaged in creating knowledge and beliefs. In this respect, one of Knight's oft-advanced points, which he attributed to Josh Billings, a 19th century American humorist, is that "it's not what we don't know that will hurt us, but what we know that isn't true." Knight recognized, as did Hayek, that market processes operated in the general direction of discovering knowledge, and with that discovery mostly operating to promote the further exploitation of gains from trade.

Where Hayek focused on the market as a process for assembling knowledge, Knight posed the problem of the as-

sembly of knowledge within a political rather than a market context. Central to Knight's formulation was the distinction between discussion and debate. For Knight, democracy was idealized as a political system where people governed themselves. For this idea to be realized in practice requires that the democratic process operate through discussion as distinct from debate, and with discussion possibly leading to consensus. With respect to democracy and consensus, Knut Wicksell (1896, 1958) is especially interesting and informative, particularly with respect to the influence Wicksell had in shaping James Buchanan's approach to constitutional political economy, as Wagner (1998) examined.

Debate is often described as a means of establishing some truthful answer to a point in question. This description is surely mythical. Debate might establish a winner as judged by an audience. Debate establishes a "last man standing," so to speak, but that is all it can do, as Knight recognized so perceptively in contrasting debate with discussion. Debate is a clash of presuppositions, with the aim being to acquire more votes from some relevant audience than the opponent. Debate aims at victory over an opponent; discussion aims at consensus between or among the participants. With discussion, the possibility of a "meeting of the minds" comes into play. With debate, that possibility is replaced by a desire to vanquish the opponent.

Whether an exchange of verbiage between or among participants is discussion or debate, moreover, depends on whether those participants form their own audience or are performing before an audience. If the latter, conversation is surely eristic and not genuine. In this respect, Tyler Cowen (2005) identifies self-deception as the source of market failure. Self-deception was, of course, a central theme of the Ancients. Whether discourse is among people who deceive themselves or is eristic in the presence of an audience is probably a moot question because the two are observationally equivalent. Consider an example from Wagner's (2018) examination of Edward Stringham's (2015) *Private Governance*. Stringham shows that it is possible to construct models where private governance can overcome all the commonly postulated problems associated with externalities and public goods. This ability of market organization to do so resides in recognition that any such postulated problem entails the presence of unexploited gains from trade among the participants. Stringham uses several historical examples to show how people did this, while also noting instances where people were able to marshal political power to prevent such action.

Such use of political power points toward eristic discourse, self-deception, and Carl Schmitt's recognition of the autonomy of the political. Wagner's (2018) simple illustration of this point entailed a five-person model of entrepreneurs who comprised a democratically-organized community. Each of the five establishes a new business, three of which fail to become profitable. What happens then? According to the theory of free markets, those three will liquidate, after which they will either create a new business or offer to work for one of the two successful businesses. Yet the three failed entrepreneurs entail a political majority. They might use their voting power to create some agency to offer support to new businesses, financed by taxes on successful business. They might try to disguise the naked use of power the three versus two appearance suggests by propounding an ideology of equal opportunity. They might even buttress that ideology by lodging claims of unjust enrichment against the successful enterprises by claiming those enterprises operated with an unfair advantage because they didn't share relevant knowledge with the less fortunate remainder of society. Whether supporters of the new agency were deceiving themselves or engaging in eristic discourse is probably undecidable and irrelevant in any case. Political power will be deployed to the advantage of those who hold it.

VILFREDO PARETO AND THE DISJUNCTION BETWEEN LOGICAL AND NON-LOGICAL ACTION

At this point, Vilfredo Pareto's (1935 [1915]) distinction between logical and non-logical action becomes relevant, and with Backhaus (1978) and Patrick and Wagner (2015) exploring aspects of Pareto's contribution to public choice theorizing. The first thing to be said about Pareto's distinction is that it has nothing to do with the distinction between rational and irrational. Pareto viewed rationality as a feature of human action, only he recognized that rationality manifested differently depending on the different environments in which people found themselves. What Pareto recognized was later treated as ecological rationality by Gigerenzer (2008) and Smith (2008). With respect to those environments, Pareto distinguished between economic or market environments and political and religious environments. In all the environments people inhabited, people acted by choosing options they valued more highly over those they valued less highly, as James Buchanan (1969) explains luminously. In market environments, they start busi-

nesses and buy products; in political environments, they chose between candidates and the operate regulatory agencies. The form of rational action is identical across environments: choose the option you value most highly among the options you face. The substantive context for rational action, however, differs among environments.

Pareto's scheme of thought followed what he called the logico-experimental method, and with Pareto's scheme of thought opening into schemes of thought whose analytical potential has not yet been fully explored, as Michael McLure (2007) explains. With respect to the actions people undertake, two things can be observed: their actions and the explanations they advance for those actions when asked, which Pareto labeled derivations. What could not be observed was the genuine driving force that caused those actions, and which Pareto labeled residues. One significant facet of Pareto's analytical scheme is his claim that derivations have unlimited variety depending on the situation the person is encased, while residues are pretty much invariant.

Armed with this analytical schema and his logico-experimental method, Pareto distinguished between the logical action that emanates within market environments from the non-logical action that emanates within political and religious environments. Again, all those actions entail rationality, only rationality manifests differently as between market and political environments Market environments place actors in the position similar to conducting scientific experiments. In choosing among products, a customer forms a hypothesis or expectation about which option provides greater value. That hypothesis can be gauged against subsequent experience. The same form of situation faces a firm deciding whether to expand its operation, open a new branch, or any of the other myriad choices it faces. All such cases entail options that are costly to the owner, and with the owner bearing the value consequences of the choices made. The market environment places actors, whether consumers, producers, or investors, in the position of betting on their choices.

By contrast, political environments elicit non-logical action because the logical-experimental method does not pertain to actors who do not invest in their actions because those actions do not create outcomes. The actors still deploy their faculty of reason, only it is directed in a different direction. Citizens voting for candidates is probably the quintessential form of democratic action. Numerous theorists from Anthony Downs (1957) to Geoffrey Brennan and Loren Lomasky (1993) and Bryan Caplan (2007) have noted that voters have little incentive to become informed about political matters because their votes are indecisive in all but tiny electorates. Pareto recognized this feature of democratic voting and extended that recognition into a theory about the qualities of democratic processes. For Pareto and his contemporary Gaetano Mosca (1939), candidates competed among themselves to secure electoral support by offering ideological images they thought would resonate with the electorate. As for the electorate who chose among those images and candidates, this environment for political action bore a formal resemblance to the environment for political action, and yet the substantive content of action diverged between the two environments.

Formally, voters choose among candidates just as consumers choose among producers. Substantively, market actions have logical character while political actions have non-logical character. The differences between the two types of action depend first on the different environments the responding consumers-voters face, and second on the different environments in which the proposing producers-politicians act. In market environments, responders invest in the choices they make and receive the option they chose. Hence, consumers can test the accuracy of their expectations against their experience with the object they chose.

By contrast, responders don't invest in their political choices, nor do they receive what they chose. The taxes that voters pay is independent of the candidate for whom they vote. Voters might choose to make contributions to political campaigns, but they do not pay for a service they have received in doing so. In this non-logical environment, voters are selecting among images the candidates have projected (Boulding 1956). As Pareto and Mosca explained, political competition entails candidates competing for voter support by projecting images that resonate more strongly with voters than the images projected by other voters. As Backhaus (1978) explains , political competition in non-logical environments can often lead voters to choose options they would not have chosen if those options had been proffered within an environment of logical action.

KOPPL IN RELATION TO HAYEK, KNIGHT, AND PARETO

Roger Koppl's analysis of expert failure extends in complementary fashion the contributions that Hayek, Knight, and Pareto set forth. In the contemporary world of specialization and a division of knowledge, each of us knows a lot about our fields of expertise while knowing little or even nothing pertaining to all other fields of expertise that none-

theless are relevant for our well-being. Furthermore, the self-identified experts in any field of activity often differ in the recommended actions stemming from their use of their expertise. Koppl identifies numerous instances of such dueling expertise.

To hope that the expertise of experts can be harnessed to the service of ordinary citizens is a significant and challenging hope to harbor, for there is no simple recipe for bringing this about, as such scholarly giants as Hayek, Knight, and Pareto recognized. There are reasonable grounds for following Hayek in thinking that the division of knowledge within the market-hosted environment of logical action generally operates to harness the knowledge of experts to the service of the general population because the knowledge possessed by experts does them no good unless that knowledge receives validation through the choices of consumers, and with those consumers being free to choose among the creations of different experts.

In politics, however, as Knight recognized, discussion among people with differing initial bases of knowledge can produce some meeting among the minds. This outcome represents Knight's idealized vision of democracy as governance by consensus generated through discussion. Discussion, however, is not a spectator sport. There are no audiences for a discussion; there are only participants. Democracy in villages and towns might plausibly proceed through discussion and consensus. In cities and nations, however, discussion gives way to debate where a few put on a show for the rest of society. Where discussion can reflect genuine discourse, debate before an audience quickly becomes eristic as political candidates seek support from the voters who comprise the audience.

The relation between experts and ordinary people has the same form as the relation between proposers and responders in ultimatum games. In that form of game, the proposer offers to a responder a share of money of which the proposer will keep the remainder if the responder accepts the proposer's offer. The responder can accept or reject the proposer's offer. Rejection means that neither proposer nor responder receive anything. With respect to experts and ordinary people, the form of the ultimatum game would give ordinary people the option to reject the expert's proposal. This is how the relationship between experts and ordinary people plays out in market environments.

By contrast, in political environments the winner of an election selects an expert for everyone. Experts do not need to achieve consensus among ordinary people to affirm their expertise. To the contrary, their expertise is established by electoral success by sponsoring politicians, as must be the case in political environments. To be sure, it is possible to imagine political environments of a consensual character, as Wicksell (1896) illustrates. Much thinking about constitutional political economy explains that typical political environments give politically-selected experts a dominant position over ordinary people, while also explaining that it is possible to imagine constitutional environments where experts are the servants or ordinary people. While such environments have been created in the imaginations of some theorists, the presence of those environments has been limited both historically and geographically.

The problem of expert failure surrounds us. In democratic systems, that failure is generally neither vulgar nor nasty. It can be annoying and irritating without being agitating. Retail stores still carry useful items, we get through airports most of the time with only modest aggravation, and surgeries and medications seem reasonably to fulfill their promises even if we can imagine better states of existence. Expert failure within democracies recalls Alexis de Tocqueville's chapter on democratic despotism in volume Two of *Democracy in America*, and with Vincent Ostrom (1997) providing a luminous meditation on Tocqueville's significance for democracy. There Tocqueville described a despotism that wore mostly velvet gloves and not mailed fists. Koppl's portrait of expert failure maps readily onto Tocqueville's portrait of democratic despotism. If any remedy exists, it resides not in cajoling experts to replace some of their arrogance with humility. To the contrary, it requires changing the environment within which experts are selected and subsequently operate toward one whose principles of operation are consistent with logical action. One instance of such an alternative environment was central to Walter Eucken's (1952) theory of constitutional order, an English-language statement of which is Kaspar and Streit (1998). Doing this, however, would reduce the scope for political action inside society by transforming the non-logical character of political action into the logical character of market action. In other words, the failures of expertise that Koppl examines stem in large part from the political environment in which experts operate, and with reductions in the range of such failures requiring some restriction on the autonomy of the political within society.

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A Peircean Perspective on Koppl's *Expert Failure*

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> Upon this first, and in one sense this sole, rule of reason, that in order to learn, and in so desiring not to be satisfied with what you already incline to think, there follows one corollary which deserves to be inscribed upon every wall of the city of philosophy:
>
> Do not block the way of inquiry.
>
> C. S. Peirce as quoted by F. A. Hayek (1967, p.134).[1]

Expert Failure by Roger Koppl is an interesting and provocative book. Koppl has focused our attention on what could be a pervasive feature of modern knowledge-rich societies and economies. The extraordinary growth of all types of knowledge and knowing and the individuals who are central to those processes is a hallmark of epistemically creative societies. Typically we call such practitioners experts. We have experts among us when such knowledge and knowing rises to a certain level where it becomes professionalized, canonized in written form and procedure, and compensated often at a premium level. Experts know a lot more about certain things and processes than other people. Experts can be associated both with the learned professions, with the sciences, social sciences, humanities and arts, and also with highly specialized trades and crafts. They may be clustered in networks of like-minded individuals who also form consulting firms and/or in loosely organized professions such as scientific disciplines, medicine, law, and accounting or even trades involved with building, construction, engineering, and the commercial arts. Communities of expertise may even extend to professional sports which now incorporate sophisticated applications of data analytics and mathematical algorithms. We consult with experts privately as special circumstances may require and also publicly as they become part of government agencies and some serve as specialist advisors to elected officials.

A problem with experts in a knowledge rich economy is that they often make mistakes. An expert may erroneously apply some well-accepted conception of his/her specialized procedures to a circumstance or situation where it unexpectedly misperforms. This may often come as a surprise and especially to those experts who are otherwise thought to be honest. There are many examples of what Koppl (p. 5) regards as expert failure in the disciplines, professions, and trades already mentioned and also in religion (p. 192). Motivation is important as well. Experts need to be endogenized within a framework of economic forces which would then acknowledge that they are sensitive to incentives, opportunities, resources, and relative costs like others in society. Of course some experts may have perverse motivations and look to exploit their expertise opportunistically more for personal gain rather than helping those who face problems and dilemmas requiring their services. In general, experts and their clients should have an expectation of mutual gain in these exceptionally asymmetric circumstances where the experts know so much more than the client or the patient. Additionally legal and professional checks may be necessary to balance the asymmetric epistemic disparity between the expert and the client. Experts can be part of or an extension of the problems that they had evolved to help solve. With or without legal rules and professional norms it is possible that expert failure might occur. The extent of expert failure is an important question and it may be just as important for the private sector as for government. If expert failure is a significant problem, then its remedy, call it expert-failure correction, is a preeminent concern. If the processes of expert failure correction are weak, then expert failure may dominate markets, science, professions, universities, and government. Those who might have capacities and abilities to solve many important complex problems in a knowledge rich world might fail more often than they succeed if expert failure is pervasive. A society and economy dominated by expert failure could be a dismal place to live.

Does Koppl raise the issue of expert failure in such a way that it does not become the end story?

One aspect of Koppl's book may be that there is no clear sense of what expert-failure correction processes might look like in general and thus whether they would on net be successful. One of the problems is that Koppl keeps falling back on competitive markets as a paradigm for how self-corrective epistemic processes might work. He especially relies on Hayek's (1936) well-known position on markets as epistemic processes where relative prices and other qualitative dimensions of goods and services in competitive markets facilitate an extraordinary decentralized process of vast overlapping networks of production, consumption, and distribution directing the flow of goods, services, and resources in almost unimaginable detail. Clearly in such processes, mistakes are made and differing degrees and pockets of market failure may occur including recessions and perhaps depressions, but economists understand in large part to what extent markets may be self-corrective and whether those corrective processes may be sluggish or limited. Some economists believe this creates a role for government intervention while others do not. And of course there are those who believe that government failure may be worse than the worst episodes and aspects of market failure.[2] However if expert failure as an array of social processes shared exactly the same characteristics as market failure then expert failure would be another form of market failure. Just like for market failure some might argue that government intervention is needed to remedy expert failure. Since the causes and circumstances of government failure have been investigated as well, some of those lessons might be applicable to expert failure. But Koppl does not make a strong claim that government could know enough to curb expert failure. Government does regulate and license some professions with mixed results as Koppl acknowledges. But this does not answer the general question of whether government could be sufficiently corrective in supervising expert knowing and practice so that pervasive expert failure could be avoided. Licensing and regulating are significant but limited activities for government (p. 205). Even though government may have a public oversight role for some professions, mostly government does not take over the expert professions and make them government agencies. There may be good reasons for such a limited role for government. But it does mean that government may be too weak or ill-structured to have a significant impact on the problem of expert failure in a knowledge rich society.

Parallel to expert failure there is another form of failure that raises similar concerns in an epistemically accentuated economy-- that is science failure. Science has had many spectacular successes in its history which do not need to be recounted here. But there have been many failures and most of them are forgotten once some new discovery is found. Science makes many mistakes and there is a sense in which those scientific mistakes as they are encountered contribute to an innovation or discovery once it has been found, created, replicated, and accepted by the appropriate specialized community of scientists. Again there is an issue of motivation. Scientists need to be considered as human individuals acting in response to relative incentives, costs, and resource constraints as their scientific work unfolds. As with experts more generally considered, scientists may want personal gain in the form of path-breaking fame, position, and reputation more than the real discoveries that benefit other people, society, and science. Problems within science first tend to show up as replication failure. Some supposedly novel discovery is published in a prominent journal gaining the attention of those within and outside of the scientific community. Then others try to reproduce or rely on that research for special applications and extensions. If replication fails, then further problems may be encountered. It may be that the researcher has made an "honest error." Something might have been recorded incorrectly or what was thought to be a small inconsequential anomaly was ignored or discovered but tossed aside for what was thought to be a good reason. Even a small but hard to detect error might make a significant difference. Such errors can be corrected and the results reinterpreted if they are still of scientific importance.

Episodes of replication failure often lead to another outcome besides honest error and this sets off a new layer of problems. Often detailed scrutiny of what was thought to be a path breaking piece of scientific research leads to allegations of scientific misconduct (Wible 1998). There are so many complex decisions that get made in most research that there are opportunities to change things slightly or even intentionally fabricate key aspects of the evidence. Once misconduct is suspected, research institutes, universities, and government agencies now have procedures in place to investigate the professional work of those so accused. Scientific fraud—the fabrication and falsification of data and plagiarism—have become major issues in science over the past few decades (Wible 2016). Misuse of research funds, labs, supporting personnel, time, and the adverse reputation it creates for those organizations which have dishonest scientists in their employ often leads to concern that science

failure may be a significant problem. The number of retractions in scientific journals has risen dramatically first in the latter decades of the 20th century and then again in the first two decades of the 21st century. Science failure has become such a significant problem that all research-grant-funding federal agencies in the U.S. now require principal investigators, post-docs, other researchers, and support staff to have certified training in the responsible conduct of research. Whether such training is adequate and strong enough to retard if not decrease research misconduct as a major form of science failure remains to be seen.[3]

The problems of expert failure and science failure may benefit from both mainstream and mainline economics.[4] According to Koppl (p. 97), the "mainline" approach to economics running from Adam Smith and Scottish common sense philosophy to Austrian economics and especially F. A. Hayek and recent Nobel laureate Vernon Smith has a much broader perspective of competition as a rich, subjective process allowing for even more complex conceptions of firms, households, markets, and product and information creation. Knowledge is not nearly so standardizable and generalizable in the mainline approach since there is what Hayek has called "knowledge of particular places, times and circumstances." Essentially an individual with a great deal of creative intelligence needs to conceive of an array of localized abstractions relevant to a particular situation.[5] In a such a highly specialized and particularized niche, an individual immersed in that situation may respond with a creative solution which would have been nearly impossible to imagine by an outsider possessing only objective, descriptive empirical knowledge known from a distance. The abstract conceptions of the situationalized knower, while they may be difficult for an outsider to understand, are objective in a special sense. Given sufficient time, appropriate exposure to, and activity in the same particularized problem situation, another second or third party inquirer might come to understand why things were theorized, empirically tested, and recommended as they were with the terms and language used to construct the situationalized knowledge for that particular circumstance.

These highly complex and particularized situations also lend themselves to epistemic error. Expert knowledge as it is created and applied in a highly unique circumstance is the context for both the possibility of expert success and failure or some unanticipated combination of both. There are limits on knowledge and knowing in complex circumstances and they may lead either to expert success or failure. One must carry out or actually implement the activity prescribed by the expert specialist in order for the consequences of the outcome to be discovered. If a second expert is consulted, then we have small numbers rivalry as a form of active, almost sports-like competition with one expert or team of specialists "against" another rather than the large-numbers competition of mainstream economics.

Besides mainline economics, another partially complementary approach to markets and innovations is of course mainstream economics.[6] Mainstream economics also offers economic ideas relevant to expert failure. Mainstream economics perhaps more so than mainline economics sharply characterizes situations when markets may work well and alternatively when they may fail. Tangible goods and services with readily observable empirical qualities which are facilely reproduced in the private sector under well-known ideal conditions of competition are defined to be private goods. Under such stringent conditions of competition, markets work well, they would be efficient, and when firm or market failure is encountered—markets would be often self-correctable. Surpluses and shortages are eliminated, new products and firms readily enter the market, and those firms which are inefficient often fail and exit the market process. There would be no need for government or expert intervention.

In contrast to private goods, other non-standard goods and services such as public goods and "information" goods have characteristics which undermine the self-corrective processes of competitive markets as understood from a mainstream perspective. Markets may fail significantly either in producing public goods or fashioning economic and institutional processes for the information goods that also have become known as intellectual property. Because information goods and intellectual property are so different than standardized, tangible goods and services, the self-corrective competitive forces of mainstream market conception may never really come into play as such. Instead, intellectual property law takes us in the opposite economic direction towards monopoly rather than competition.[7] The creation of intellectual property is usually incentivized in society by creating economic structures that are as far from competitive markets as possible. Intellectual property rights in most societies come in the form of temporary monopoly rights such as patent, copyright, and trademark protections. This turn towards monopoly and high degrees of concentration rather than competition can also be seen in other domains. Science is a very specific type of information good which at its highest levels of formulation cannot be brought under patent, copyright, or trademark. Science may be more like

a pure public good like national defense. Science seems to exist more toward the monopolistic or highly concentrated end of economic organization rather than near the theoretical ideal of economic competition. Anytime economic processes move toward high levels of concentration if not monopoly, organizational process and episodic event failure is more likely. If experts are viewed as providing applications of highly specialized expert or even scientific-level knowledge, then expert failure is much more than a trivial possibility in small numbers or even monopolistic situations.

Probably one of the least precise aspects of Koppl's *Expert Failure* is his characterization of processes of competition within ordinary economic processes with a mix of conceptual contributions from mainline and mainstream economics. At one point Koppl (p. 114) even reflects on how confusing the various ideas of competition in his book might be. He mixes examples and metaphors of competitive markets from both mainline and mainstream economics often without noting how different the underlying characteristics of these various processes may be. I do agree that the mainstream conception of competitive markets is much more richly understood if it is amended with the richer conceptions of cognitive creativity that Hayek, Kirzner, Popper and even Peirce might bring to highly intelligent actors on both sides of conventional markets. Beyond markets of relatively uncomplicated tangible goods and services lie markets for complex goods and services which have many qualitative dimensions which require high levels of cognitive ability. In these manifoldly complex circumstances, specialization may give way to even higher levels of specialization and scientific experts may emerge or even reemerge at even more esoteric domains of specialization. Although one could continue describing many variations of economic processes across many differing domains of expert and scientific knowledge creation, an alternative could be to take up Hayek's discussion of circumstances when "competition" is very different from the competitive market analysis of a hybrid version of mainline-mainstream economic competition. This hybrid in part is what Koppl (2006) has also identified as "heterodox mainstream economics."

In an essay titled, "Competition as a Discovery Procedure," Hayek (1978) sketches the outlines of a very different conception of competition.[8] He even mentions that this conception is closer to what happens in games and sports. Figuring out the conditions and circumstances of competition as the mainstream conception of markets does is not sufficient for an epistemically active society and economy. As in sports, the process or "game" must be played to completion just to discover which player or team in fact does win. Prediction of an outcome before the game is played can use all of the best information, experts, specialists, and scientists society has, yet the outcome can be different than what was forecasted. Science and expertise in my view are more like sports in this regard. The ideas of the expert and the scientist must be carried out in their domains, their unique investigations, and their highly tailored clinical applications just to see which knowledge options actually work or are effective. The situations for producing these venues of knowledge creation are very different. Often they involve just one or two competitors or perhaps a few more. The production of knowledge and expertise typically comes in the form of a few or a small number of rivals rather than the large numbers of economic competition. Sometimes it may only take one individual expert or scientist to make a discovery essentially playing a one-person game against nature. At the frontiers of science and expertise, monopoly may be a necessary organizational process of last resort.

Small numbers rivalry is a very different kind of "competition" than the competition of conventional or even a hybrid version of mainstream/mainline economics. Small numbers "competition" has inherent benefits and difficulties. The fewness of small numbers of competitors combined with greatly specialized and perhaps even highly esoteric knowledge creates niches where the practice and discourse of the epistemic specialist likely would be highly shrouded. Those without even an educated lay person's awareness of the nuances of a domain of professional activity may find the mind set and conduct of the scientist and/or an expert unintelligible if not baffling. Those outside of the expert's knowledge niche may need to create and have proxies for trust and competence in the expert. Even these epistemic proxies also may be fallible. Reputations of individual experts and scientists do evolve but they can still be inaccurate. Some professions do develop professional codes of ethics and others may evolve well-established norms of interpretation and practice (Koppl p. 75). Advanced educational credentials and certifications may also help to fill in the picture of how competent an expert or professional scientist may be in his/her domain of specialized inquiry and application. But expert failure, even if kept in check, would seem to be a persistent problem for advanced, epistemically rich societies and economies. Science and expertise take place in contexts of relatively high economic concentration and the small numbers rivalry of competition as a discovery procedure.

The idea of expert failure persistence becomes even more of a concern if the intellectual context for the preceding comments is made explicit. If mainstream economics is dominated by an empiricist theory of human knowledge and understanding, then it leads to a mechanistic and thin understanding of economic and knowledge creating processes. In such a thin epistemic process, informational variables providing a few key dimensions of relative information value and scarcity are taken as providing empirical indicators that optimizing transactors need to have in order to be successful with their epistemically-laden economic activities. An optimizing theoretical perspective typically emphasizes mentally neutral conceptions of widespread patterns of behavior rather than active subjective cognition of individuals within those patterns. What mainstream economic theory lacks is a theory of what economic actors do if they need to create or produce the knowledge they wish to use rather than merely responding to empirical indicators. The question then arises about what happens if obvious and thinly-dimensioned relative price information is not available or inadequate? What if the mainstream economic view does not give enough richness and depth to make sense of ill-structured circumstances? Quite clearly new knowledge and other indicators or knowledge need to be produced. Hayek's special circumstances of time and place and also competition as a discovery process are now relevant. The production of new knowledge regardless of its level of application typically occurs in an evolutionary process and not in some mechanistically thin conception of empirical indicator optimization.[9]

What is different for knowledge creation is the conceptualization of a new idea before it has been implemented. The new idea might come as a surprise or it might be a creative twist of something already known. But its success in some future application needs to be imagined before inquiry tests that notion. Typically such notions are called hypotheses. Here one can turn to the ideas of the pragmatist philosopher, scientist, and occasional economist Charles S. Peirce. In contrast to others, Peirce called this process of conjecturing a new idea—whether it is at the frontiers of science, mathematics, philosophy, the economy, or elsewhere in human activity—an abduction.[10] For a much more complete discussion of abduction see Wible (2018). Abduction is an evolutionary process of cognitive creativity and discovery. The term abduction was coined by Peirce in order to place it next to the similarly named and better known processes of deduction and induction. Deduction happens in mathematics and logic and more broadly in deducing implications from broader theoretical ideas. Induction is usually thought to be a process of generalizing from empirical details.[11]

For Peirce neither deduction nor induction is a source of new abstractions or knowledge about the novel phenomena, relations, and patterns encountered in human experience. Nothing really new can be learned from deduction and induction, thus the process of abduction. All three processes working together—deduction, induction, and abduction—fundamentally portray how humans reason in Peirce's view. An abduction is a guess or a conjecture about something that is different and/or how the future might be different than any implication coming from deduction or induction. Peirce conceived of abduction as the most creative aspect of his three-pronged view of human reason in order to circumvent the philosophical and psychological problems that are often raised about human mental activity. The human mind is notoriously difficult to model and has led to sharply different theories, psychologies, and philosophies of mental activity. In particular Peirce was very unhappy with the psychological theories and philosophies of his well-known friend, William James. James has offered some of the most famous and creative interpretations of human cognitive activity. James subjective cognitive psychology drew the attention of economists such as Frank Knight, Thorstein Veblen, and Wesley Mitchell. James' subjectivism has drawn some comment from Koppl (pp. 169-170) as well. One can imagine that James' masterful descriptions of humans in complex cognitive situations could be used to understand some of the complexities facing experts and scientists both when their work is going well and when it is failing.

Peirce sharply disagreed with James over a few things and one of them concerns accepting ideas when information and evidence is weak. James famously argued that when the evidence is weak regarding some important question, we have the right to believe what we want to believe. James (1896) called this the "will to believe." The will to believe was specifically about whether one can believe that God exists even if the evidence is weak. James argued for the affirmative position. Beyond religious belief one can extend the will to believe more broadly. Certainly Peirce thought that was what James had in mind. The comment at the top of the paper, quoted by Hayek, is Peirce's response to James' "will to believe." It's not just in the religious domain, but in many other areas of life and knowledge creation that evidence may be weak relative to what one would like to know. New knowledge, especially new expert and even scientific knowledge, or any newly formed principle of application formulated to make sense of an uncertain situation, requires a more criti-

cal attitude than a mindset of authoritative certainty. Here Peirce argued for a "will to learn" with its corollary: "Do not block the way of inquiry" as Hayek quoted it in 1967. This is clearly an antidote for expert failure. Be alert to the limits of what one knows and the need to produce new expertise, new science, and new practice when those limits have been encountered. A mechanistic mind set may pervade those who are less critical in their specialized domains of science and practice. Those who believe in mechanistic processes with something like errorless precision—whether in nature, physics, biology, medicine, economics, or the expert professions—simply do not realize how inaccurate the most accurate methods of observation, measurement, and practice may be in those domains of inquiry. Attempting to measure things like the speed of light and gravity in his own day and probably the nation's greatest expert on weights and measures in the late 19th century, Peirce (1892, p. 303) held that the best results of science may be no more accurate than the "upholsterer's measurements of carpets and curtains." Similarly he claimed "the idea of mathematical exactitude being demonstrated in the laboratory will appear simply ridiculous" (Peirce 1892, EP 1, p. 303).

As already noted, a few years later Peirce would formulate his "will to learn" in response to James' "will to believe." That statement of the "will to learn" was followed by a few general sentiments about how robust the nature of science can be in an uncertain world. Quoted together we have these words:

> The first thing that the Will to Learn supposes is a dissatisfaction with one's present state of opinion.... (Peirce 1898, pp. 170-171).
>
> The only end of science, as such, is to learn the lesson that the universe has to teach it.... But insofar as it does this, the solid ground of fact fails it. It feels from the moment that its position is only provisional. It must then find confirmations.... they are only partial. It still is not standing upon the bedrock of fact. It is walking upon a bog, and can only say this ground seems to hold for the present. Here I will stay till it begins to give way. Moreover, in all its progress, science vaguely feels that it is only learning a lesson (Peirce 1898, p. 176-177).

Then a few paragraphs later comes the quote at the beginning of this review, the passage quoted by Hayek and others "Do not block the way of inquiry," (Peirce 1898, pp. 178). Thereafter, Peirce mentions several ways he imagines inquiry can be blocked. The road to learning and inquiry could be blocked with an attitude of absolute assertion or by the opposite disposition that nothing can be known. Another barrier to inquiry may be the view that something is so basic that it cannot be explained or understood in a more fundamental way. A fourth barrier to inquiry could be the idea that one has found the last or even a perfect explanation of what is being observed or experienced. Anyone of these ways of blocking inquiry together or separately might account for many patterns of expert and science failure. Surely there are others.

Here it can be argued that experts and scientists need to have the more critical attitude of the "will to learn" rather than the "will to believe." One can understand how a long and complicated graduate level education or professional internship in some intricate niche of professional knowledge and practice might lend itself to hubris, misinterpretation, and a culture of authority as described by Peirce in attitudes that block the way of inquiry. So-called "authorities" may dislike those who might question their expertise. Koppl provides episodes from many domains of research, inquiry, and expertise where experts believe that because they are experts and have become authorities in their fields that consequently they should not be questioned by a rival professional, cross-examined by lawyers, or even criticized by interested lay parties. Just because one has acquired a vast body of knowledge and practice that is quite useful when appropriately and professionally practiced at a high standard does not insulate one from episodes of expert and/or science failure. If nature and human experience are open, evolving, and capable of novelty at many different levels then a unique event can occur for which there is no known solution, practice, or procedure. Such openness argues for the cultivation of an attitude of humility so that the expert and/or scientist can recognize when something fundamentally new is encountered. The next client, patient, social phenomena, or natural event may bring something never observed to this point in history. Past practice applied to novel phenomena is a prescription for failure if the novelty fails to go unrecognized.

If the attitude of the expert allows for the nearly contradictory simultaneous awareness that either success or failure may be imminent in the next circumstances emanating from the patient, experiment, or problem-situation, then one might have a general sense of optimism about experts and expertise in general. Optimism would be warranted if experts reflect the sentiments of Peirce's quote just above.

Paraphrasing for experts we could have this more specialized Peircean statement of how to proceed from the will to learn:

> The only end of expertise, as such, is to learn the lessons that science and practice have to teach ....But insofar as expertise does this, the solid ground of fact may fail. If feels that expert theory or practice from moment to moment is only provisional. It must then find confirmations that are only partial. It is still not standing upon the bedrock of fact. It is like walking upon a bog and one can only say this ground seems to hold for the present. Here I will stay till it gives way to newer results and facts. Moreover, in all its apparent progress, any area of expertise should feel that it is only learning the next lesson that phenomena encountered in this line of inquiry would teach.

Beyond this general Peircean perspective, there are a few issues that could be raised however briefly with this view in mind. One significant concern relates to the widely used phrase, marketplace of ideas. That metaphor is often asserted in order to extend the conception of a self-corrective free market from the realm of commerce, goods, and services to the domain of ideas and scientific research. However, the conception of a marketplace of ideas is mostly carried too far. If one is serious about these epistemic processes from an economic perspective, one needs to realize that the production of new ideas and scientific research share almost none of the economic characteristics of competitive market processes as most economists understand that term. Extending what was argued previously, the "market place of ideas" is permeated with economic organizational and process characteristics usually associated with economic concentration and market failure rather than self-correctiveness. How these processes could ever be successful in the knowledge domain when they raise legitimate concerns about market failure, government failure, science failure, and expert failure is a subject worth investigating. Koppl (pp. 217-220) and some of his co-authors have begun to study this problem and they should be commended for doing so. Koppl and others have done explorations of alternative institutional designs. These may help identify when and how otherwise highly concentrated economic processes such as those in expert professions and scientific investigation might succeed at least in a limited way. Some day the literature on how situations of small-numbers of rivalrous players succeed and are somehow corrective in the face of economic forces of concentration engendering error could be placed along side our understanding of why and how many market situations are self-corrective. These could be entirely new understandings of how the private sector is successful separate from government and markets as conventionally understood.

Another more specific area of expertise deserving some comment and raised by Koppl (190-191) with regard to expert failure is central banking. Probably the most prominent central bank on the world stage today is the U. S. Federal Reserve System. Similarly the European Central Bank, a relatively new creation with the advent of the European Monetary Union, has many of the same institutional features of the Fed and finds itself embedded in a political union of capitalist, market-oriented economies. Also, central banks around the world routinely communicate and act in concert especially when they perceive the need to do so. By definition central banking is a domain of high economic concentration internationally and usually something like near-monopoly domestically. Here as in other domains, there is expert failure. The literature on the Great Depression of the 1930s and the Great Inflation of the late 1960s and 1970s places significant blame on the Fed for making those otherwise recessionary or inflationary economic situations much worse than they needed to be. Similarly for the recent Great Recession of 2007-09, John Taylor has criticized the Fed for lowering short term interest rates too much and for not following his historically and empirically supported "Taylor Rule" of monetary policy.[12] While these critiques of the Fed are powerful, one might suspect that central banks are going to be a prominent feature of the institutional structure of advanced financial economies into the foreseeable future.

Probably a more relevant approach to the flaws and errors of central banking would be to bring lessons of expert failure, science failure, and market failure to central banking in a new way.[13] One of those lessons for central banking would be to let domains of market efficiency alone wherever they may flourish; or if some government role is helpful, to expect aspects of government failure and thus minimize the role of government to the greatest extent possible. Another lesson would be to learn from past mistakes of central banking history and a third might be to cultivate a skeptical attitude regarding the sharp assurances of forecasters especially when confronted with novel innovations and circumstances in the economy and financial markets. It does appear that the Fed as an institution has learned to some degree from its historical mistakes in past economic cri-

ses. At the time of the recent Great Recession around 2007, many of the Fed's top economists seemed to be very much aware of the past mistakes of that institution. As mentioned it had pursued contractionary monetary policy quite unwittingly in the 1930s and did not do enough to dampen inflation in the 1970s. The Fed also seemed to be aware in the early 2000s that macro theory had taken a turn towards general equilibrium theories of the economy that had very little to do with severe short term economic fluctuations. This sets up something of a duality of expertise between the "monetary historians" and the macro general equilibrium "theorists" who aim to create more consistent macro models. Some macro theorists outside the Fed had even expressed the view that the discipline knew enough to forestall any future economic crisis similar to the magnitude of the Great Depression. Actually short term economic forecasting of the sort that central banks might find helpful has almost entirely disappeared from the macroeconomics taught in doctoral programs. Also macro theory as such seems to play a less important role in monetary policy formulation but for a new class of models termed new Keynesian dynamic stochastic general equilibrium (DSGE) macro models. Every central bank now seems to have a DSGE model. The new Keynesian models do incorporate dynamic microfoundations, a conception of the general interrelatedness of all markets, and they embed self-corrective market processes in a new way. The mindless and very mechanistic Keynesian interventionist conception of monetary policy of the late 20th century seems to have receded into the past.

If central banks are prone to expert failure and can never come close to being a central planning agency, one might ask what other lessons or roles could be learned. An alternative perspective could be to view the central bank as being embedded within the knowledge creating economy of mainline/mainstream economics and as such having limited but important roles. As such keeping the payments and financial transaction structure of the economy intact through severe crises could be one of them. If one regards the financial system as a vital payments system essential for the success of the whole economy, then one would want that system to survive intact even through the worst of economic crises. One of the roles of central banks could be to serve as something like a limited public utility regulator with regard to the payments system with responsibility for keeping the transaction grid of the economy and financial markets functioning. For example, if local governments collapse financially as some like New York City, Cleveland, and Orange County have done, society would still need to use roads, streets, and expressways even if those entities fail. Allowing the collapse of the transportation system on top of a government bankruptcy would compound and prolong market failure and economic recovery. Similarly allowing the payments system to collapse as banking and financial institutions collapse would worsen any serious economic and financial crisis. A policy of keeping the payments structure intact provisionally through the worst times of a crisis would seem to be an important step in keeping the crisis from going to a deeper level. This public- utility-like payments system role is important to thinking about what central banks might do successfully.

Another important role for a limited central bank would be to recognize that the Fed has something like a supreme court role for certain aspects of governance and economic policy. Deep structural conflicts in government spending and debt management may emerge within advanced democratic economies. Repeatedly in human history, strong political leaders have demonstrated a willingness to spend more on their priorities while in office and leave it to later governments and generations to deal with sharp increases in sovereign debt. Clearly long-term deficit spending coupled with rising proportions of sovereign debt historically has led to inflation and inflation often has led to political instability. To check the inflationary tendencies of the executive and legislative branches of most modern financially sophisticated nations, many of those countries have structured it so that central banks are independent of other branches of government. While this level of separation has not been achieved officially by formally amending the constitution, it has become something like a constitutional level of institutional innovation. Central bank independence means that legislative and executive branches of government have a check and balance on their worst fiscal excesses and imbalances. Central bank independence needs to be conceived as part of the system of constitutional level checks and balances providing a supreme-court-like veto over government budgets and spending plans that are too extreme and could lead to the collapse of constitutional governance altogether. Thus the central bank needs to serve as a constitutional level check on the economic excesses of the executive and legislative branches of government.

Now it is time to end this review reiterating where it began. In *Expert Failure*_Koppl has favored us all by focusing on important side effects of a complex epistemic society and economy with many avenues of professional and scientific expertise which fail from time to time. In terms of Koppl's own four categories of expert failure, I probably fall in be-

tween some of them. His (p. 28) four categories come from having two types of experts (who succeed or fail) intersect with two categories of lay responders (who behave actively or passively with regard to the experts). His own view tends towards a focus on experts who fail coupled with non-experts who are active and empowered. My view would be to toggle at least initially between Koppl's position and an alternative. Initially I would keep both the prospect of expert success or failure alive and open as possibilities. An attitude of provisional expert optimism needs to be maintained continuously until confronted with an episode or evidence that warrants switching to Koppl's expert failure position. In spite of the myriad possibilities for expert and science failure, those engaged in epistemic processes seem to push them forward more often than they fail in my view. Expert success happens just enough to make these processes worth doing. Expert failure is a significant problem and the only way to keep it in check is to be aware of that problem. A reflexive attitude needs to be kept in mind in the background of thought and practice all of the time. This is the real contribution of Koppl's *Expert Failure*. By having a reflexive but subdued awareness of the possibilities of expert failure running in the back of one's mind and in tandem with an active focus on problems to be solved in order to move forward, success may be found. An awareness of the possibility of expert failure will contribute to the success of those processes. This paradoxical awareness should never go away no matter how much success one has had in whatever field of inquiry, experiment, or therapy. The next episode of science or professional expertise may encounter something truly new. A concern with expert failure may be the only way to keep its worst consequences in check and for expert success to outweigh failure. To answer the question raised previously, consideration of Koppl's *Expert Failure* does not lead necessarily to the pervasively dismal outlook where expert failure is controlling systemically. Overall expert failure seemingly fails to dominate expert success and this would seem to be a good thing. I believe that Koppl would agree with that optimistic assessment.

NOTES

1. Hayek would have had access to this quote in Peirce's *Collected Papers* (Vol. 1, p. 56) which first appeared in the 1930s. The quote was part of Peirce's (1898, p. 178) Cambridge Conference Lectures which have been published in as a complete set of lectures in the late 1990s. Karl Popper also seems to have read Peirce's *Collected Papers*. For a discussion of Peirce and Hayek on abstract ideas and sensation see Wible (2011).
2. For a more extensive discussion about government failure see Dolfsma (2013).
3. This writer has participated in creating an innovative RCR (responsible conduct of research) training program at the University of New Hampshire. UNH may be among the leaders of this type of training. Other universities and colleges across the nation have had to deal with a similar government mandate as part of eligibility requirements for federal research grants. One needs what amounts to a "goldilocks" attitude about such efforts. An RCR program needs neither to be too weak nor too strong. In the context of the extraordinary complexity of the many sciences, social sciences, and private and public research funding sources, RCR programs need more to inform and educate rather than offer some conception of professional and scientific correctness.
5. Koppl (2006) provides a similar distinction between what he calls a heterodox or pluralistic mainstream economics and neoclassical economics. Neoclassical economics would be the textbook orthodoxy found in most leading microeconomic texts of the past few decades. In this book, Koppl seems to use the term "mainline economics" very similarly to what he called heterodox mainstream economics in the 2006 article.
4. The following comments are interpretations based on Hayek (1952, 1967) and Wible (2011).
6. Here I use the term mainstream to refer to the dominant view of late 20th century economics, the neoclassical synthesis of micro and macroeconomics. Here the focus is more on the micro side.
7. Cooter and Ulen (2012, pp. 113-126) explore the monopolistic side of intellectual property rights and information goods.
8. On his conception of competition see also Hayek (1946).
9. McQuade and Butos (2003) provide a rich analysis of how a non-market process evolves corrective features when prices and property rights of science are very different than those of the standard markets, goods, and services of mainstream economics.

10. Peirce stated abduction in the form of a syllogism in parallel to similar statements for deduction and induction. For an abduction we have:

    The surprising fact, *C*, is observed;
    But if *A* were true, *C* would be a matter of course.
    Hence, there is reason to suspect that *A* is true.
    (Peirce 1903, EP 2, p. 231).

11. Such generalization could be simply that certain observations amount to a connected pattern of phenomena that are related in some way not yet fully understood. A more general and universal connection such as causality creates well-known logical problems. A problem of induction occurs if one tries to make a leap from a finite sample or pattern to a universal statement of causation. One might have had a run of good luck and not have encountered the contrary instances which would stand in the way of stating a principle of the highest level of abstraction.
12. Taylor's critique and the response of Fed Chairman Ben Bernanke is summarized in Mishkin (2015, pp. 403-404).
13. Clearly central banks do not see their mission as solving the socialist calculation problem as Hayek formulated that issue in the 1930s.

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Response Paper

ROGER KOPPL

I am honored and humbled by the kind attention my book has received in this Cosmos & Taxis symposium. I thank the journal, its editors, my friend Bill Butos, and the symposium contributors for their interest, efforts, and comments.

I suppose *Expert Failure* was a confession of sorts: This I believe. Or perhaps I should call it *cri de coeur*, for I believe that the problem of experts deserves our urgent attention. But it is not enough to cry out. One must act. And one's actions must not make things worse. First do no harm. To help guide our actions, we need a true and proper theory of experts, some way to put that theory to the test, and a way to translate tested theory into action. I am bold enough to think I have made progress on those fronts. I have built on the work of others, of course, including Berger and Luckmann (1966), F. A. Hayek, David M. Levy, Sandra Peart, Vernon Smith, and Stephen Turner. I think I have made enough progress, however, to claim some degree of novelty for my effort. And some of the novel elements in the book probably deserve attention before I comment on the symposium papers.

First, I have provided a novel definition of "expert," without which progress in the theory of experts may be stymied. In the past almost all definitions of "expert" hinge on the expert's supposed expertise, driving some writers into futile attempts to somehow distinguish "true" from "false" expertise. Such definitions of "expert" have another irresolvable problem. Because each person occupies a unique place in the division of labor, each person has special expertise. But if everyone is an expert, no one is an expert, and the word can do no intellectual work. Cutting the Gordian knot, I define an "expert" as "anyone paid for their opinion." Thus, an expert is defined by their contractual role rather than their supposed expertise. Armed with this definition, I can show that economic models of expert choice are not just credence goods models, asymmetric information models, or standard principal-agent models, obvious overlaps notwithstanding. It is a distinct subfield of economics, which deserves separate attention.

Second, I have provided a structural theory of expert failure. The theory is not exhausted by the simple table I give in Chapter 10 (p. 190), but that figure (reproduced below) identifies the most important institutional elements of the theory. There are two main institutional dimensions to expert failure. The first is whether experts are merely advisory or whether, instead, the expert chooses for the non-expert. The second is whether experts are in competition or, instead, enjoy monopoly power. The highest chance of expert failure comes from the "rule of experts," wherein monopoly experts choose for the non-expert. The lowest chance of expert failure comes from "self-rule or autonomy," wherein competing experts offer advice without being able to choose for the non-expert.

	Monopoly expert	Competitive experts
Expert decides for the non-expert	**Rule of experts** Examples include state-administered eugenics programs, central planning of economic activity, and central bank monetary policy. Highest chance of expert failure	**Quasi-rule of experts** Examples include school vouchers, Tiebout competition, and representative democracy.
Non-expert decides based, perhaps, on expert advice	**Expert-dependent choice** Examples include religion under a theocratic state and state-enforced religion.	**Self-rule** or **autonomy** Examples include periodicals such as *Consumer Reports,* the market for preferences, and venture capital. Lowest chance of expert failure

Finally, I might make a comment about "epistemic systems design," which is a variant of Vernon Smith's "economic systems design." In the latter we go to the human-

subjects laboratory to test the economic properties of different arrangements. We can compare, for example, Dutch auctions, in which the price is lowered until a taker is found to English auctions in which the price is raised until no more takers are found. It turns out that English auctions are more "efficient." They do a better job of getting the goods into the hands of those who value them most. Once you have a market design that works well in the laboratory, you can export it to the real world. Your design may well need some adjustment once it has made the move from the constructed social world of the laboratory to the natural social world, but the basic design features will probably work more or less as planned. This is the work that helped earn Smith a Nobel Prize. I have suggested that we go to the human-subjects laboratory to test the *epistemic* properties of different arrangements. My co-authors and I have shown, for example, that a properly designed system of redundancy in forensic science could reduce error rates (Koppl et al. 2008). I have said that it is not enough to cry out; we must act. Epistemic systems design is a technique that helps us to both test theory and translate tested theory into action. An old joke notes that everybody complains about the weather, but nobody does anything about it. The problem of experts is not like the weather. We can do something about it. And I believe I have found principles and techniques that may help us to mitigate the problem in at least some important contexts such as forensic science.

GARZARELLI AND INFANTINO

I am grateful to Garzarelli and Infantino for their stimulating precis of my book. They represent an Italian branch of the Austrian school, which deserves more attention. Magliulo says, "Nowadays, the Austrian School enjoys a high reputation in Italy" (2018, p. 66). Contributions to the Italo-Austrian school of social science include Garzarelli et al. (2019), Garzarelli and Keeton (2018), Infantino (2003), Cubeddu (1993), Antiseri (1990), and many others.

Garzarelli and Infantino adroitly describe my book as "a treatise in *socioeconomic epistemics*." Social scientists do not ignore epistemics. If my framing is not badly mistaken, however, they tend to have inappropriate models of the production and distribution of knowledge in society. In the book, I tried to provide evidence that Hayek's vision of dispersed knowledge is still not well appreciated, even though his knowledge papers (1937, 1945, 1946, 1974,1978) are frequently cited.

We should probably change our whole epistemic perspective and adopt a more broadly Hayekian perspective. My discussion of "SELECT" knowledge was meant to clarify what Hayek's very different epistemics are. It may be that I deviate in some way from Hayek's epistemic vision, in part, perhaps, under the influence of Mandeville. Or it may be that I have done nothing more than repackage Hayek's ideas for a new audience. It is, of course, a matter of indifference whether I have or have not somehow deviated from the master. In precisely the context of Hayek's legacy, Peter Boettke (2018, p. 29) has said, "Scholars should be judged not only by the answers they provided to the problems they tackled during their careers, but the questions they motivate others to ask and the new avenues of inquiry their work opens up." And it seems fair to say the Hayek's knowledge papers opened up new epistemic avenues of social science research. My epistemics are "Hayekian" because they emerge from an exploration of the new avenues of inquiry Hayek opened up. Garzarelli and Infantino seem to hint that my "synecological knowledge" is little different from Vernon Smith's "ecological rationality." Certainly, Smith (2009) helps me to work out the idea of SELECT knowledge. In any event, I think Garzarelli and Infantino are right to say, "SELECT's synecological element is arguably the most fundamental epistemic pillar upon which *Expert Failure* rests." And it is this element which seems underappreciated and underdeveloped in social science today, notwithstanding important exceptions such as Smith (2009), Hutchins (2009), and Boettke (2018).

Garzarelli and Infantino attempt to lift the gloom of my epistemic pessimism, particularly regarding the entangled deep state, by calling for improved training of individual minds. Parents teach their children simple heuristics such as "honesty is the best policy." We can, similarly, "invest in making individuals more *risk savvy*," by teaching appropriate heuristics à la Gigerenzer (2015). "Somewhat paradoxically," they say, "a possible solution to the tyranny experts" might be "to render more individuals experts along *more* than one decision making margin." This solution seems in the same spirit as Levy and Peart's call for "transparent non-transparency." In both cases, the call is for improving the individual's ability to competently question the expert's opinion. In my lingo, such moves would make individual non-experts less "powerless" and more "empowered." I of course favor a more empowered laity. I confess, however, that I remain gloomier about such things than Garzarelli and Infantino.

Though I may be more epistemically gloomy than Garzarelli and Infantino, I do not forget that we should all do what we can in our various individual situations. And many of us should be working along precisely the lines Garzarelli and Infantino identify. In particular, educators should educate, which entails empowering their students. It is a cliché that schoolteachers and college professors often prefer obedience and admiration to educating their students. We should reach higher. We should (among other things) help our students to acquire the knowledge and thinking skills they need to competently evaluate expert opinions. We should help them to learn when to heed the expert's advice, when – and how – to seek out more knowledge or information, and when to discretely flout the expert's advice. Teachers have a fundamental moral and professional duty to enable, encourage, cultivate, and preach such empowerment. This duty is on us in American higher education in spite of all its many flaws, sins, and perversities. College students, as Caplan (2018) explains clearly, are mostly there get credentialed, not educated in anything like the sense I have just sketchily indicated. College professors, as Brennan and Magness (2019) explain clearly, have the same humdrum motives as bus drivers and accountants. College administrators, as Lukianoff and Haidt (2018, pp. 200-201) explain clearly, prefer conformity and quiescence to free speech and open inquiry. We cannot, therefore, expect American higher education to provide much education. But each of us on the lonely side of the podium is a privileged actor with a moral duty to any of their students who might have at least some interest in education, rather than just certification. We have a moral duty to enable the sort of learning that happens only with a small minority of students. We have a moral duty to preach the meaning and value of education to students who may never before have had the opportunity to hear such talk and think such thoughts.

BOETTKE

If my book has merit, much of the credit goes to Peter Boettke, and not only for his kind encouragement. For many years now, Pete has been helping all of us in what he calls "mainline economics" to craft our research agendas and to position them appropriately within the larger context of the social sciences. I have been the happy beneficiary of his intellectual leadership. Regarding *Expert Failure*, it was Pete who saw the value of positioning my theory of experts in the context of Vincent Ostrom's *The Intellectual Crisis in American Public Administration*. Boettke notes the important link between institutions and epistemics. I appreciate his emphasis on knowledge generation. Hayek's notion of "dispersed knowledge" is not just about different people knowing different things. It is also about knowledge discovery, knowledge generation, and knowledge emergence. It is about learning. Boettke's recent book, *F. A. Hayek Economics, Political Economy and Social Philosophy* delves deeply into the Hayekian link between knowledge and institutions, which Boettke deftly dubs "Hayek's *epistemic institutionalism*" (2018, p. xviii). The book plumbs "Hayek's deepening exploration of the epistemic properties of alternative institutional arrangements." I believe Boettke first used the term in a *Liberty Matters* forum on "Hayek's Epistemic Liberalism" (https://oll.libertyfund.org/pages/lm-hayek). I included the following two paragraphs in my comments there, and they seem apposite here as well.

The issue in epistemic institutionalism is how different social arrangements (institutions) affect the way dispersed knowledge is used, what sorts of facts people are likely to discover, and so on. How do alternative institutions influence the epistemic performance of the social system? Boettke discussed the salient example of socialism. Without a stock market, the economy cannot allocate capital well and things will go badly. Socialism is perfectly possible, but rational economic calculation under socialism is quite impossible. So-called capitalism, on the other hand, has a stock market. It has, therefore, market prices for capital goods and capital combinations. Rational economic calculation is therefore possible under "capitalism." Under "capitalism" people can *learn* which capital combinations have greater value and which have less value. Capital therefore tends to move toward higher valued uses and away from lower valued uses.

Hayek seems to have only slowly arrived at a full understanding of the importance of epistemic institutionalism. Late in his career he said, "Together with some later related papers reprinted with it in *Individualism and Economic Order*, ['Economics and Knowledge'] seems to me in retrospect the most original contribution I have made to the theory of economics (Hayek 1994, p. 68)." But in his 1937 paper he says, curiously, "I do not mean to suggest that there opens here and now a wide field for empirical research. I very much doubt whether such investigation would teach us anything new." I think, instead, that his insights into dispersed knowledge open *many* wide fields for empirical research. Any of the standard sub-disciplines within economics can be studied from the perspective of epistemic institutionalism. The Mises-Hayek argument on socialist

calculation should be at the center of comparative systems theory (Boettke 2001). Easterly (2013) has brought Hayekian epistemics to development economics. Kirzner (1973) showed the centrality of epistemic institutionalism to the core of microeconomic theory. And so on. Coyne (2008) studies war from just this perspective. Horwitz (2015) has brought this perspective to the study of the family. My co-authors and I have looked at criminal justice (Koppl and Sacks 2013), forensic science (Koppl 2005, 2010) and experts (Koppl 2012, 2015, 2018) as problems in epistemic institutionalism. We should be bold and creative in applying Austrian epistemics to diverse topics such as art history, the administrative state, child protective services, medicine, and espionage.

BUTOS

The problem of experts would not exist if we all knew about the same things. But in an advanced division of labor, there is also an elaborate division of knowledge. Butos focuses on this central point. I am not surprised to see such a focus from Butos. He and his co-authors have returned again and again to Hayek's knowledge papers and his seminal work in theoretical psychology, *The Sensory Order*. (See, for example, Butos 2012, Butos and Koppl 2007, and McQuade and Butos 2005.) Early in my career I enjoyed disproportionate benefits from this focus of Butos' scholarship. My collaboration with Butos, which included the first published paper on Big Players, helped me to develop and refine my ideas on the production and distribution of knowledge in society.

Butos is right, I think, to emphasize "system-level knowledge." If my interpretation of dispersed knowledge is about right, then systems of interacting persons generate a kind of system-level knowledge not readily addressed by epistemologies that begin with a definition of "knowledge" as "justified true belief." Some bits of the knowledge co-evolving with the division of labor are bookish, explicit, and housed within human crania. In the main, however, it is Synecological, EvoLutionary, Exosomatic, Constitutive, and Tacit (SELECT). Butos explores such knowledge with the concept of "adaptive classifying systems," which he and Thomas McQuade have developed in earlier work (McQuade and Butos 2005). Doing so seems entirely apposite to me. We could almost view "society" as a "knowing system" except that it is "non-teleological" as Butos is careful to point out. It probably doesn't matter whether we call such classifications "knowledge" as long as we recognize what is and is not "non-reflexive, unconscious, and non-teleological." SELECT knowledge is knowledge because it shapes and informs the "teleological" choices of individuals and organizations. Butos emphasizes the parallelism between Hayek's theory of mind and the adaptive classifying systems that produce system-level knowledge. In both cases we have an emergent order that does epistemic work without which the emergent system would collapse into its separate components, no longer functioning as a synecological whole.

DEVEREAUX

As Butos notes, centralized decision making may easily impair the epistemic properties of the system being centralized, with this risk generally being higher the more complete the centralization. For this reason, I have called for the piecemeal dismantling of the administrative state. Devereaux suggests that this call may be unnecessary. She foresees "piecemeal circumnavigation of the administrative state." She illustrates this possibility with the sharing economy, crypto currency, and smart contracts.

Devereaux's argument bears some similarity to Ed Kane's "regulatory dialectic" (Kane 1977, 1981, 1988). Kane's argument builds from an insight that has recently been developed in detail by Richard Wagner and his co-authors under the felicitous label "entanglement" (Wagner 2010, Smith et al. 2011). Kane says, "Far from being a politically self-contained disturbance to financial markets, 'deregulation' is an endogenous response by regulators to changes in the economic constraints that financial markets impose upon them" (1988, p. 328). Kane goes on explain the "regulatory dialectic" of "regulation," "avoidance," and "reregulation." In this game private actors are generally lighter on their feet than hidebound regulators. In the long-run, however, the dialectic tends to culminate in efficient regulations. "Precisely because inefficient patterns of regulation impose excessively burdensome costs either on regulatees, their customers, or the general taxpayer, the burdened parties must be expected sooner or later to develop avoidance strategies by which to throw these burdens aside" (1988, p. 333). This argument for regulatory efficiency has some similarity to arguments for the efficiency of the common law made by Adam Smith (1776), Paul Rubin (1977) and others. I hope Devereaux is right. Her argument is, at a minimum, plausible. And we have at least some precedent. Newspapers in California in the 1860s would sometimes list persons who had defaulted on their gold-denominated debts by forcing depreciated legal tender on their creditors (Cross 1945, p. 273). Greenfield and Rockoff (1996, p. 905, n. 2), who draw

our attention to Cross's article, tell us such forcing was called "greenbacking." Outing greenbackers was a workaround that greatly reduced the importance of fiat money inflation in California. The digital workarounds Devereaux points to are happening right now. The process may well culminate in the withering away of the importance of the state, though it will likely not cause the withering away of the state itself.

Devereaux's argument seems to suggest that democratic politics will grow even crazier in the coming years. She notes an implication of her circumvention thesis: "Choosing good political representatives will matter less, and the opportunity cost of voting based on impulse and emotion rather than based on reasoned reflection will go down." Indeed, the opportunity cost of whimsical, impulsive, and performative political action will fall for all participants in the political process, including both voters and the elected representatives of the people. If the opportunity cost of something goes down, we generally get more of it. And technological advance seems to be reducing the opportunity cost of political melodrama. Politics is spectacle, and the spectacle does seem to be growing increasingly showy and shallow in at least some of the world's rich democracies. In the US today Team Blue and Team Red vilify one another in increasingly virulent terms. My opponent is no longer "worthy," but evil, stupid, and an immediate threat to all that is good and decent or even to life itself (Kalmore and Mason 2019).

I am reminded of the fanatic loyalty to blue and green teams in Byzantine Rome, which produced the infamous Nika riot of 532 in Constantinople. The political dimension to such fanaticism is debated, as is the uniqueness of the Nika riot. But we should view the madness of it all as a warning.

Competing teams in Roman chariot races were distinguished by their colors. Over time blue and green came to be the dominant two colors. Adherents to each color often came into violent conflict in the wake of the victory of one and defeat of the other in the arena. The Nika riots were a particularly infamous case of violence between the Greens and the Blues. Gibbon's (1776) description is vivid.

> [T]he women, from the roofs and windows, showered stones on the heads of the soliders, who darted firebrands against the houses; and the various flames, which had been kindled by the hands of citizens and strangers spread without control over the face of the city. The conflagration involved the cathedral of St. Sophia, the baths of Zeuxippus, a part of the palace, from the first entrance to the altar of Mars, and the long portico from the palace to the forum of Constantine; a large hospital, with the sick patients, was consumed; many churches and stately edifices were destroyed, and an immense treasure of gold and silver was either melted or lost. From such scenes of horror and distress, the wise and wealthy citizens escaped over the Bosphorus to the Asiatic side; and during five days Constantinople was abandoned to the factions (p. 25)

In the United States today we do not have the Blues and the Greens; we have Team Blue and Team Red. As the state grows increasingly irrelevant, one's adherence to Team Blue or Team Red will have less and less to do with considered policy preferences and more and more to do with personal identity. The more easily we circumvent the administrative state, the more purely symbolic will be one's political loyalty. Can we laugh off the show as silly spectacle? Or should we be afraid that mad politics will reverse the very technological advances that had been making the administrative state increasingly irrelevant? I think on long views of, say, 200 years and more we can be relaxed and happy. If Koppl et al. (2018) are right, technological progress will continue to enrich us. And rich people are better at defending their rights than poor people. But in the short run of 50 to 150 years, things can go very badly indeed as the Soviet Union illustrates. On the one hand it lasted "only" about 70 years. On the other hand, how much human suffering accumulated in those decades!

LANGLOIS

Richard Langlois has been a deep intellectual influence on me. To cite just one important example, he taught me the importance of the "system constraint" in generating predictable outcomes, which is an insight central to my theory of Big Players. His fealty to the truth has also been a valuable object lesson for me. This fealty to truth has led him to delicately criticize my discussion of corporate power. It is possible, of course, that Langlois's erudition and penetration, which well exceed my own modest skills, have led him to the better view. But I think he misses a distinction that may be relevant to our disagreement. I must take the blame, however, for flagging the distinction in question only by an oblique reference to "reasons not entirely unlike those Hayek articulated." I should have been clearer. I cited

favorably Hayek's (1960) essay "The Corporation in a Democratic Society: In Whose Interest Ought It To and Will It Be Run?" Langlois correctly characterizes the "pyramiding" Hayek there decries. "Hayek . . . warns of the dangers of allowing corporations to hold stock in other corporations, which permits a pyramiding of holding companies: an apex company can hold controlling stock in daughter companies, which can in turn hold stock in other companies, and so on down the line, providing the owner of the apex company with control of vast resources that are mostly owned by minority shareholders." Although I cited Hayek, pyramiding was not my concern. As far as I can tell, Langlois has the right fix for pyramiding: "Let expert would-be managers compete in the market for corporate control." This solution requires, as Langlois notes, "removing anti-takeover defenses (and other pro-management legal arrangements) in order to allow true competition to discipline (expert) managers."

My concern was not pyramiding, but something we might call "levitating." A group of firms is levitating if it collectively owns controlling shares in itself. I gave a simple (and merely illustrative) numerical example in my book. In that example 1) a majority of firm A's shares are owned by firms B and C, 2) a majority of firm B's shares are owned by firms A and C, and 3) a majority of firm C's shares are owned by firms A and B. As long as these three firms continue to levitate together, no group of human stockholders can influence the management of any of the three firms in the levitation set. The market for corporate control is suspended for levitating firms. It is levitating, not pyramiding, that produces the result Hayek feared: "the tendency of corporations to develop into self-willed and possibly irresponsible empires, aggregates of enormous and largely uncontrollable power" (Hayek 1960, p. 311). While my numerical example was illustrative, Vitali et al. (2011) have shown that levitating is a real phenomenon. They find a significant degree of levitating among large transnational corporations (TNCs). A "large portion of control flows to a small tightly-knit core of financial institutions." And "nearly 4/10 of the control over the economic value of TNCs in the world is held, via a complicated web of ownership relations, by a group of 147 TNCs in the core, which has almost full control over itself." Moreover, "3/4 of the core are financial intermediaries."

What will levitating firms do? We can start to answer that question by considering what they will not do. They will not act to maximize profits for any human shareholders. (Of course, when we speak of "profit maximization" we really mean – or should mean – maximizing the wealth of shareholders.) It may well be appropriate for a levitating firm to issue dividends or buy back shares of common equity. Doing so could make stock ownership attractive to entities outside the levitating set. And the consequent ability to raise capital from stock issues will help a levitating firm, no less than a grounded firm, to minimize its cost of capital. But in this scenario stocks might almost be compared to callable bonds with variable coupon payments and no maturity date. A levitating firm has no incentive, however, to return any more value to its shareholders than is required to minimize its cost of capital. Any remaining surplus can be plowed back into the enterprise or other firms in the levitation set. It is generally in the interest of management in a levitating firm to prioritize growth over profits. Presumably, growth is not the only goal of a levitating firm. Stability seems an obvious candidate. Management wants a predictable environment from which to extract its rents. And it wants it wants to protect those rents from competition. Thus, a large levitating firm is likely to be a strong voice in opposition to "greed" and "unbridled capitalism." It is more likely to be a cronyist creature than co-equal competitor.

It seems reasonable to fear the potential political power of levitating firms.

Before turning to Scott Scheall's contribution, I would like to express disagreement with Langlois on the role of discretion in government bureaus. Citing Weber's theory of bureaucracy, Langlois says, "The flunky who came to the door to take the kids away had no discretion; she was just following the rules." The bureau that snatches the child away hires an expert to make a judgment of the parents' supposed fitness. The judgment given is subjective; there is no parental-fitness algorithm. If there were, the bureau would have no need of a credentialed expert. The expert's opinion is then plugged into the machine as a kind of replaceable module. Indeed, citing Reid (2012), I provided an example in which the relevant bureau in the UK sought out an expert opinion three times over before getting one that suited its apparent bureaucratic interests. Something similar can happen in forensic science, where the forensic examiner's subjective opinion about potentially ambiguous data is plugged into the larger criminal-justice system. This modular role of expert opinion creates a great scope for discretion in the administrative state. This role of discretionary expert opinion in the administrative state abrogates the rule of law, which, Dicey tell us, "excludes . . . wide discretionary authority on the part of the government" (1982, p. 120). The administrative state is not a bulwark of the rule of

law. It is an interesting exercise to consider whether a purely algorithmic administrative state might be unpredictable and thus in violation of the rule of law. As far as I can tell, however, that would be an arid and purely speculative exercise. The substantive "real world" point seems to be the role of subjective judgement in ambiguous circumstances.

SCHEALL

Scott Scheall tells us that politicians are like drunks: they look for their keys under the lamppost. This point seems valid and worth pursuing. I wonder, however, whether Scheall and I have fully compatible views of the role of "epistemic burden" in human choices. Scheall says, "If I am correct that ignorance serves to determine incentives, then, other things equal, we should expect to find fewer experts with regard to relatively epistemically burdensome topics and more experts regarding topics with respect to which adequate knowledge is more easily acquired." As far as I can tell, Sheall's expectation is mistaken. We seem to have an abundance of experts in areas he would, I think, consider to be "epistemically burdensome." As I say in my book, "Under competitive conditions in the market for ideas, the demand for magical thinking meets a willing supply." In financial markets, "technical analysis" is demanded and supplied. Psychics and wizards persist notwithstanding the advance of science. In the Christian Bible Jesus says, "But of that day and hour no one knows, not even the angels of heaven, but My Father only" (Matthew 24:36). And yet many persons who believe the Bible to be divinely inspired demand the services of experts who will tell them when the end times are nigh. Science, too, has often enough given us spurious insights into the unknowable future. For example, Foerster et al. (1960) predicted "Doomsday: Friday, 13 November, A.D. 2026" in the prestigious pages of *Science* magazine. As Koppl et al. (2018) say, "Their humor and irony notwithstanding, they seem to have been sincere in estimating that a population singularity would occur around 2026. But population growth rates began to fall within about a decade and well before reaching the pitch predicted by their model." Scheall says there are "few experts on extending your height." While this is probably true, there are many experts on how men may achieve an equally improbable anatomical extension.

TURNER

Stephen Turner is the author of a classic article in the theory of experts, "What is the Problem with Experts?" When I first tried to learn the literature on experts I wrote to Turner for help, which he generously offered even though he did not know me. His generosity on that occasion reflects the highest standards of academic citizenship. Turner's contribution to this symposium notes the problem of massive error among experts. And it is a difficult problem. He says, "Koppl doesn't have a solution to the problem of massive error, and neither do I." He's right. I do not have a scheme to detect or root out massive expert error. An old joke has a science skeptic insisting that the earth rests on the back of a turtle. And what does the turtle rest on, asks the scientist triumphantly? It's turtles all the way down, replies the skeptic. Turner notes that science and, indeed, all knowledge has a turtles problem. "[I]t is markets for opinions, including opinions about opinions, all the way down." Turner is right once again.

Turner's turtle problem crops up even in logic and pure math, as is illustrated in Lewis Carroll's (1895) charming essay, "What the Tortoise said to Achilles." Tortoise asks Achilles whether he accepts a simple deduction in Euclid's elements. The two premises are A: "Things that are equal to the same are equal to each other" and B: "The two sides of this Triangle are things that are equal to the same." Tortoise then draws the conclusion Z: "The two sides of this Triangle are equal to each other." The unsuspecting Achilles agrees that it is a fine piece of reasoning. Tortoise points out a hidden premise, however. C: "If A and B are true, Z must be true." And now we are, as it were, off to the races. For there is yet another hidden premise, D, to the effect that if C, A and B are all true, then so is Z. The game cannot be brought to a close and poor desperate Achilles must endure the reading out of an infinite list of hidden premises. It's tortoises – I mean turtles – all the way down.

The turtle's problem and the problem of massive expert error are related. Massive expert failure is possible because it is opinion all the way down. I have noted in my book techniques that can mitigate – though never remove – the turtles problem and its unhappy progeny, massive expert failure.

One thing we can do is practice epistemic systems design, which I described above. Another thing we can do is eliminate professional licensing, which tends to augment the monopoly power of experts. Licensing restrictions strengthen

professional associations. Azocar and Ferree (2016) make the crucial point in a useful review article.

> The sociology of occupations and professions emerged with primary concern to explain what was distinctive about professions, which scholars defined as their capacity to monopolize esoteric knowledge (Parsons, 1939; Hughes, 1994; Wilensky, 1964; Millerson, 1964; Becker, 1970; Friedson, 1970). As a result, expertise became the core feature of professions. Expertise was understood as not only having both practical and theoretical dimensions (what knowledge was and how it was used) but also intrinsically evolving into ever more rational forms (Parsons, 1939; Friedson, 1970; Abbott, 1988).

Such measures can be helpful, I think, but they cannot eliminate massive expert failure. Nor can the get around the turtles problem.

WAGNER

It is probably fair to describe my book as combining Virginia political economy with Austrian epistemics, as Garzarelli and Infantino note in this symposium. And Richard Wagner has long represented the intersection of the Virginia and Austrian schools. Today, thanks in large measure to Peter Boettke, we think of that intersection as obvious and natural. And, indeed, the earliest founders of public choice theory were deeply influenced by Mises and Hayek. (See Koppl 2006.) But there was a time when Richard had little or no company in that space. His patient work there has been an important service to both traditions.

The context for my work is very broad indeed. The literature on experts stretches back to antiquity and ranges widely from mathematical complexity theory to the history of Anglo-American law to phenomenological sociology and beyond. Wagner draws attention to three important figures in this firmament: F. A. Hayek, Frank Knight, and Vilfredo Pareto. Of these three, Hayek has been the most important direct influence on me. If it can be shown that my book deviates from Hayek in some important way, then so much the worse for Hayek. And my reading of Mandeville may have drawn me to a more radically egalitarian epistemics than Hayek gave us. My inner subjective feeling, however, is that it's all in Hayek and I have, at best, reframed a few important Hayekian truths.

Wagner is right to chide me, if only implicitly, for neglecting Pareto's distinction between logical and non-logical actions. (The terms "logical" and "non-logical" are probably unfortunate, here, as they do not carry their ordinary meanings.) Citing Backhaus (1978) he notes that "political competition in non-logical environments can often lead voters to choose options they would not have chosen if those options had been proffered within an environment of logical action." I am reminded of the 1969 film "Putney Swope," which satirized white power and a corrupt corporate culture. The title character is the one black figure on the otherwise all-white board of an advertising firm. When the chairman of the board dies, they must elect a new chairman. But no one may vote for themself. Each of the (male) white board members decides to maximize his chance of winning by voting for the one person they all know cannot win, Putney Swope. In this way Swope is elected, much to the horror of his racist colleagues. In the fictional film, it is a good and delightful thing that the childish folly and corruption of others swept Swope swiftly into power. Unfortunately, an equally childish folly and corruption among legislators can destroy democracy, as illustrated by the rise of the fascist Dollfuss regime in inter-war Austria. In 1932 Dollfuss came to power in Austria as a result of a ballot mix-up and a childish dispute between two deputies. (See Greaves 2011 p. 31 and references cited therein.) The political circus of modern rich democracies may continue to be nothing but tragi-comic entertainment. Devereaux's circumvention thesis may give us reason to hope so. But the final collapse of democracy in Austria should give us pause and, perhaps, induce us to think how we might avoid a similar fate.

Wagner's discussion of the Knightian tradition is subtle. It is an important and honorable tradition. I appreciate, for example, a Knightian point flagged by Wagner: Our political preferences are not independent of political action, including political discussion. And I appreciate the Knightian insistence on equality between the theorist and the theorized, which I invoked when noting "the anthill problem." As social scientists, I said, "We see society as an anthill and people as ants. We gaze down upon the anthill as if we were higher beings," whereas each of us is, in reality, but another ant in the anthill. Alluding to Simon's comment on Cournot (1976, p. 140), I said, "The permanent and ineradicable crisis of social science is the theorist's dual role as godlike observer and equal participant" (p. 20). The anthill problem closely related to the "analytical egalitarianism" rightly touted by Peart and Levy (2005, p. 3). And yet I wonder if I

—or Wagner—fall fully within the Knightian "discussion" tradition.

If Levy and Peart (2017) are right, the "requirements" for Knightian "discussion," include "real listening and moral restraint." But, following Mandeville, I have to doubt how much "real listening" humans are capable of. Every discussion with another person, and every internal dialogue is an opportunity for both deception and self-deception. We are taught the "Habit of Hypocrisy, by the Help of which, we have learned from our Cradle to hide even from our selves the vast Extent of Self-Love, and all its different Branches" (Mandeville 1729, vol. I, p. 140). Modern evolutionary psychology seems to support the view that humans have a universally shared "capacity for self-deception" (Nesse and Lloyd 1992). Wagner seems to recognize the problem of self-deception. He cites favorably Cowen's (2005) analysis of self-deception in politics, which has pessimistic conclusions for democracy. "Democracy does not give us wealth-maximizing outcomes," Cowen concludes, "but perhaps it does the best job possible, relative to alternative institutions" (p. 448). Knight had distinguished discussion from debate. Wagner notes, however, "Whether discourse is among people who deceive themselves or is eristic in the presence of an audience is probably a moot question because the two are observationally equivalent." If Mandeville and, indeed, hosts of thinkers ancient and modern, are right about human self-deception, then Knightian discussion may be harder to achieve than its advocates seem to believe. As Cowen says, "[I]t is very difficult to improve the workings of politics" (2005, p. 448).

These thoughts on discussion, debate, and self-deception raise the problem of populism and technocracy, which is present in many countries today including most of the rich democracies. Citing Mudde (2004) and Bickerton and Accetti (2015) my book notes that in the US and elsewhere we are increasingly clustered about the two poles of populism and technocracy, which are alike in rejecting pluralistic democracy. I fear that voices at each pole may be growing more explicitly anti-democratic. To cite a minor, but quite recent, example, on 23 April 2019 Will Wilkinson of the Niskanen Center tweeted, "I'm Madisonian enough to think Trump's power is straight-up illegitimate, independent of questions about it [sic] election results" (https://twitter.com/willwilkinson/status/1120715489574105089). Mr. Wilkinson seems to have forgotten that a democratic electorate might freely choose candidates and policies he dislikes.

Wilkinson aside, many "progressive" thinkers seem to have adopted an attitude of superiority to the very populations they claim to be working for. They are like the communist Gillian in the Wyndham Lewis novel *The Revenge for Love*, who mused, "The proletariat were the weak-spot in the communist scheme of things, ultimately" (1937, p. 203). She despised the very proletariat she would save. "Those who were *not* of the class for whom all this was being done had to be a sort of saint, as far as she could see, to stomach all they had to stomach—in the way of ingratitude, recrimination, and general brutality." Gillian was "full of class-hatred of the class it was her hard lot to save" (1937, p. 219).

If technocrats often despise the democratic electorate that they pretend to serve and protect, we must not lurch to the populist political pole in attempted solidarity with ordinary persons. Surely, our sympathies should be with ordinary persons and most with the least among us. But populist leaders, like their progressive duals, seek to deny the democratic legitimacy of their political opponents. This alarming state of affairs is illustrated by Donald Trump's suggestion in 2016 that he might not accept defeat in the 2016 Presidential election and by recent hints that he might not accept defeat in the 2020 race (unattributed 2016, Bort 2019). The populist leader and the technocratic expert alike pretend to have possession of the truth. And they would forcibly impose that supposed truth on the people in the name of democracy. It is a relative detail that the technocrat invokes book learning and infallible science, while the populist invokes common sense and the wisdom of the people. In both cases the supposed knowledge being invoked is embodied in a person with power (the monopoly expert or populist leader) and is said to be unassailable. Someone imaging themself to have unassailable knowledge may easily think that dialogue is unnecessary. They may think that dialogue creates the danger of making the better argument seem the worse and the worse argument seem the better. This danger is equally present with technocrats and populists. It is an open question how to avoid these undemocratic political poles and cut a secure path to pluralistic democracy.

WIBLE

James Wible takes a rather more optimistic view of experts than I. He seems confident in the value of credentialing, for example, notwithstanding my attack thereon. "Advanced educational credentials and certifications may also help to fill in the picture of how competent an expert or professional scientist may be in his/her domain of specialized inquiry

and application." Wible does not seem to recognize a difficulty with such credentialing, which I tried to emphasis in my book. "Professions such as medicine, law, and pharmacy," I wrote, "may often serve to keep outsiders out and insiders in" (p. 205). In that case, credentialing makes the problem of experts worse and not better. Professions tend to give experts monopoly power.

Wible sees clearly that experts are paid. But it is not clear to me whether he recognizes such payments as essential to very meaning of "expert" in my system. It almost seems as if Wible equates experts to their expertise. "Experts know a lot more about certain things and processes than other people." Often they do! But such expertise, I have insisted, is neither necessary nor sufficient to make one an expert in my sense. In my definition, recall, an expert is anyone paid for their opinion. It is a contractual role and not something about who knows what.

Wible's principal line of attack on expert failure is to admonish experts to be humble. He "argues for the cultivation of an attitude of humility." Wible quotes Pierce's admonition "Do not block the way of inquiry." He (Wible) then says, "This is clearly an antidote for expert failure. Be alert to the limits of what one knows and the need to produce new expertise, new science, and new practice when those limits have been encountered." In this symposium, Wagner takes a position more agreeable to my own view: "If any remedy exists, it resides not in cajoling experts to replace some of their arrogance with humility. To the contrary, it requires changing the environment within which experts are selected and subsequently operate toward one whose principles of operation are consistent with [Paretian] logical action." Should we cajole experts to be more humble as Wible recommends? Or should we change the environment within which they work? The policy of cajoling is the policy of high hopes and good wishes. Only a policy of structural change can be consistent with economic logic.

Wible says, my "real contribution" is showing that "a reflexive attitude needs to be kept in mind in the background of the thought and practice all of the time." The passive voice is significant here. Precisely who should keep a reflexive attitude? The expert or the non-expert? If the former, Wible is taking up the position of Colander and Kupers (2014, pp. 173-174): Admonishing experts to be humble. If the later, he is taking up the position of Peart & Levy: Admonishing non-experts to be skeptical. I certainly agree that experts should be humble and non-experts should be skeptical. That normative stance, however, is not a theory of experts. Nor does it help me to learn when expert failure is more likely and when less. Nor does it present design features of institutional reform that might help people to reduce the incidence of expert failure. It is wisdom, not social science. I hope not to spurn wisdom. But I hope also to have produced a volume on the *science* of experts. Indeed, I am vain enough to imagine that my work, which builds on Berger, Luckmann, Peart, Levy, Turner, Hayek, and others, may be viewed as a founding text in what we might call "expert studies."

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Editorial Information

AIMS AND SCOPE

COSMOS + TAXIS takes its name and inspiration from the Greek terms that F. A. Hayek famously invoked to connote the distinction between *spontaneous orders* and *consciously planned orders*.

COSMOS + TAXIS offers a forum to those concerned that the central presuppositions of the liberal tradition have been severely corroded, neglected, or misappropriated by overly rationalistic and constructivist approaches. The hardest-won achievements of the liberal tradition has been the wrestling of epistemic independence from overwhelming concentrations of power, monopolies and capricious zealotries. The very precondition of knowledge is the exploitation of the *epistemic* virtues accorded by society's *situated* and *distributed* manifold of spontaneous orders, the DNA of the modern civil condition.

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COSMOS + TAXIS acknowledges the generous support of the Lotte & John Hecht Memorial Foundation.

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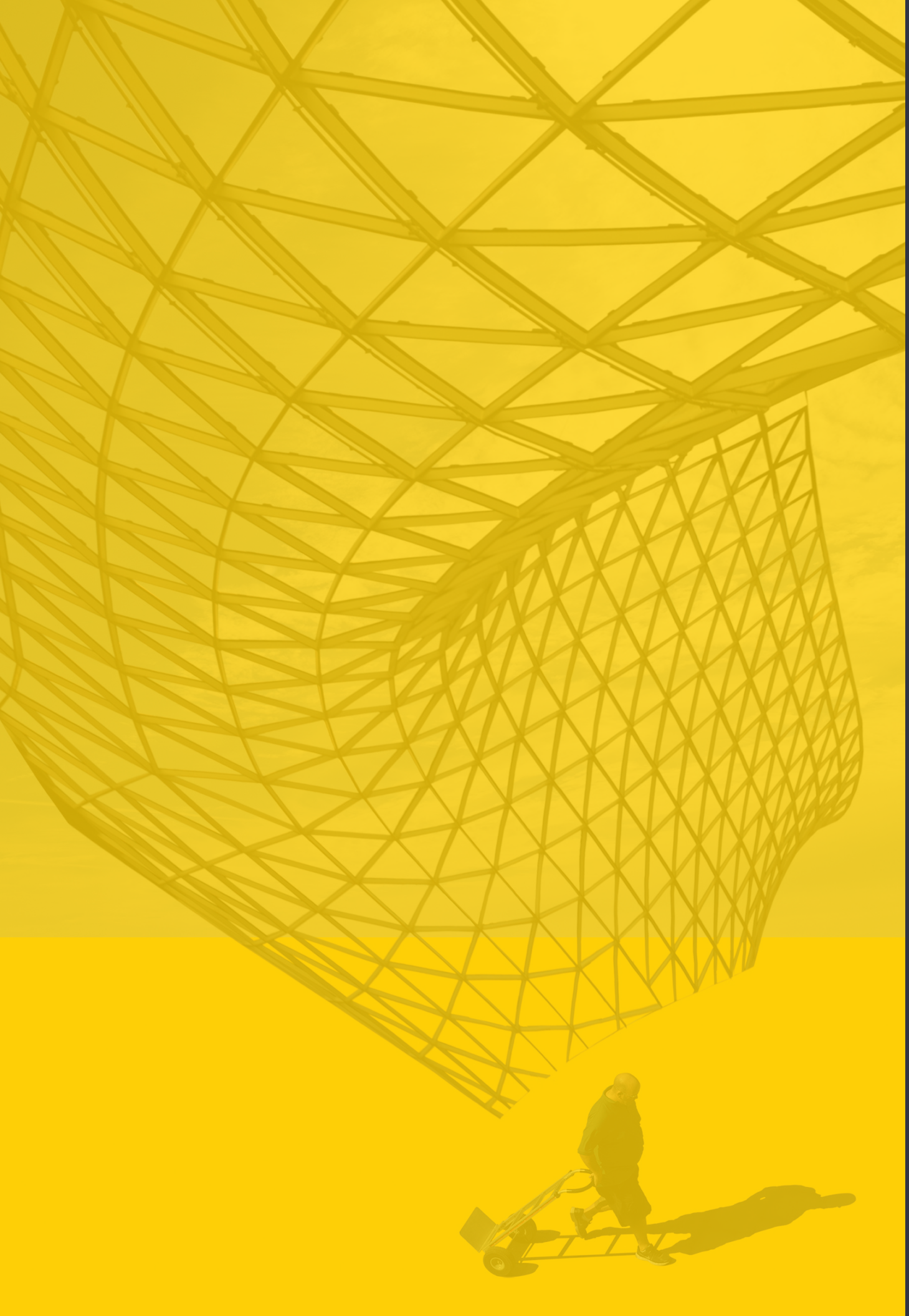

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