Government and Science:

How Scientific Progression is Slowed Down by Intervention

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Abstract

Throughout history, misinformation and ignorant theories have continued to form, in recent times this problem seems to be worse than ever. To explain why these theories built on poor science persist in our current society I use a model of scientific progression to analyze the effects of government intervention in the field of science. Influential literature is drawn upon to support theoretical assertions about government intervention's effect on scientific progression. I find convincing support for open inquiry and against government intervention through the analysis of economic consequences and comparison of open versus restricted inquiry. In the end, open inquiry is concluded to be the most efficient route.

Keywords: Government Intervention; Science; Progression; Inquiry

I. Introduction

Most people can probably relate to having a family member or friend who has some sort of outlandish belief that seems just too odd to be true. Uncle Eddy won't stop bringing it up at the family get-together. Something about the government trying to control our minds by messing with our water. Everyone knows Eddy is full of it but for some reason, they can't seem to convincingly prove him wrong. This is partially because most of them know that deep down there is something wrong with the water. They've heard about the declining health of residents who receive water from public systems. The question is why? After all, the government has set up strict regulations and checks to ensure this water is safe for consumption. The other reason why they can't disprove Eddy is that he hasn't made this up himself. Eddy discovered this explanation through sources and studies that seem to make sense. Somehow the family doesn't have any explanations more plausible than the Illuminati brainwashing conspiracy theory. Admittedly, the situation that has just been described is largely hypothetical, yet most people can sympathize with it.

The point of this paper is to attempt to explain this phenomenon. So why, given knowledge of a truth that goes against the status quo established by our government, are theories built upon bad science perpetuated? Government intervention harms the progression of science by hampering open inquiry through various methods, thus mistakenly labeling any scientist researching outside of their proposed standard as a sort of "quack" and subsequently Ceteris Parabis generating more false information while limiting true information.

The issue of government intervention halting scientific progression has not received a significant amount of attention in the literature. However, many acclaimed authors have written on the individual aspects of this topic. When it comes to explaining scientific progression solemnly are any names thought of more than Thomas Khun. In his book: *The Structure of Scientific Revolutions* Khun provides an in-depth explanation of scientific progression and how it occurs. Khun's work was fully devoted to the domain of science and therefore had little to no mention of government. However, Murray Rothbard infamously has had much to say about government and its effects on society. His books: *Power and Market: Government and the Economy* and *Man, Economy, and State* give a fantastic explanation of Austrian economics and the influences (or lack thereof) government intervention has on society. Bryan Caplan's book: *The Myth of the Rational Voter* proposes that average members of society have little understanding of important economic information that dictates important policy and therefore they vote irrationally. Hayek has written the essay *The Intellectuals and Socialism* that points out how influential intellectual trends are in their countries and the societal directions that followed them.

By pulling on these towering intellectuals and authors this paper will combine their works into a cohesive argument against government intervention in scientific research. This paper will attempt to shed light on a blind spot in the literature surrounding this field. Most works regarding the topic of misinformation try to assert what governments should do to cease the spread of it. In contrast, an applicable framework consistent with Khun's paradigm shift that also accounts for the role the government currently plays is provided here. The possibility of the government not acting is explored. Thus, offering a promising and unique explanation for murky scientific consensus.

This paper is split into four different parts dedicated to unboxing this societal issue. The first part will explain the framework and context that the paper will build on. Part two will provide support for the framework established in the first section and for the problem itself. Much of this section is also dedicated to showing how influential this problem could be. After laying out the framework and then affirming that this would be a real issue the third section goes into the economic consequences one would expect to see as a result of this issue. Lastly, I will compare society with government intervention to a theoretical society that lacks intervention.

Method/Framework:

To convey this issue properly it is necessary to create a model that depicts how society progresses in the field of science. It can be thought of as a sort of spectrum. One end of the spectrum is labeled “Truth”, and the other is labeled “Falsehood”. This spectrum is also connected to another axis labeled time. At any point in history, society is at a certain point on this spectrum/graph regarding any scientific field. Naturally, one could work out that as time progresses society would ideally move towards the true end of the spectrum. This is done through scientific research, experimentation, and discovery typically done by outstanding scientific actors. Being closer to the true end of the spectrum represents movement toward a more commonly desired mode of operation or understanding regarding a particular scientific field or practice. Being closer to the false end represents operating under a less ideal understanding or using false practices. It is important to note that we are not concerned with determining what the truth is or where we are on this graph. It is simply meant to depict an abstract picture of scientific progression at any given time.

As mentioned earlier society is at any point in time located somewhere on this graph. This means that there is generally accepted knowledge among most scientists and society that

they have come to through research, experimentation, and discovery. Then comes the government. A common practice of government is standardizing knowledge and practice into enforceable and acceptable parameters. Such action seems natural to most people. We must have laws and regulations to govern us and protect our various rights. Science is no different. The government sets up standards or a "status quo" that it enforces using several methods. Alas, as is customary of government intervention, it often has unintended consequences. This status quo becomes a barrier or wall on the spectrum meant to stop actors from performing practices and coming to conclusions that would regress backward toward falsehood. The unintended aspect of the status quo is that it also forms a barrier on its other end making it harder for scientists to progress toward truth. Therefore, effectively locking society in place as if it were caught in quicksand. Admittedly this may not seem like much of a problem…until it is. Whether the government likes it or not society is still in the middle of progressing, often under duress. There are times when events occur, problems arise, or "inconvenient truths" come about that cannot be explained by our current understanding of reality. In other words, the status quo cannot explain the issue. In cases like this, there are certain "actors" who would attempt to explain or solve the phenomenon.

The actors I am referring to are of course scientists. They are the next piece of this framework that works on and along the spectrum. Any kind of scientist one can imagine is eligible if they are participating in the progression of their craft. All may be eligible but that doesn't mean that they are all the same. In this framework, the scientists are separated into three classifications. For now, I am going to explain two of them. The first group of scientists are the ones with the potential to take society further towards the true end of the spectrum. Their goal is to progress humanity forward in whatever field they study. For our purposes, they will be

appropriately referred to as “revolutionaries”. The second group of scientists relevant to the framework isn’t as bright as the former. These scientists are not capable of progressing science toward truth. They are simply not proficient enough at their job to contribute much to the fields that they study. Both groups desire to make contributions for various reasons. One can easily imagine what these reasons could be. Monetary gain, fame, notoriety, etc.... all of these are valid motives. However, when performing their work, the second group of scientists often end up coming to conclusions or obtaining results that fall closer to the falsehood end of the spectrum. This is why I have affectionately labeled them as “quacks”. Both groups of scientists would aim to solve/explain the phenomenon. The question is: Do they?

The chances are slim due in large part to the barriers put in place by the government. As mentioned earlier, the government uses various “methods” to form a sort of barrier preventing “quacks” from using unideal practices closer to falsehood. However, these barriers have the unintended consequence of disincentivizing revolutionaries from moving outside of the status quo toward truth. See, to the government there is little to no difference between revolutionaries and quacks (at least at first). Both groups’ research would be residing outside of the government’s barriers. Presenting themselves as a red flag that is undermining the status quo. Thus, preventing them from solving the issue. What could these “methods” be to disincentivize these revolutionaries from seeking monetary gain, fame, and notoriety when they have what it takes to obtain them? These barriers are built upon multiple forms of government intervention which include subsidization, regulation, licensing, and blatant coercion through government agencies.

The first and possibly most rampant form of intervention the government uses to create barriers is subsidization. By funding certain research, the government incentivizes people to

participate in said research. This is a major problem whenever the research they're incentivizing cannot explain an inconvenient truth. Research done outside of the government's established status quo is less likely to occur because there is less funding for it. How much funding is the government providing? It was calculated that government investment totaled "$179.5 billion in FY 2021" for research and development.[1] With a pool of funding as large as this, there isn't much reason for scientists seeking monetary gain to work outside of the status quo. As mentioned before, this has a disproportionate effect on revolutionaries as compared to its effects on quacks. Revolutionaries are good scientists who have the capability of aiding societal scientific progress. There is a high likelihood that they, as good scientists, are already receiving funding from the government. If they already have funding, then there is little incentive to move outside the barrier where there may not be funding. We also cannot rule out the possibility that a revolutionary could lose already possessed funding for performing research across the boundary. What about the quacks? The Quacks, or bad scientists, are not as disincentivized by subsidization as the revolutionaries. Quacks are still incentivized to stay within the boundaries because they are seeking funding just as the revolutionaries are. However, due to their incompetence, they may not be able to achieve this goal even when staying in the status quo. Due to this, subsidization has less hold over their actions. Quacks also lack the possibility of having previously possessed funding from being taken away.

The second boundary factor is regulation. This can serve as a very clear and concise example of government intervention. Capable of being freely administered by government bodies and used to restrict certain research. "Regulation consists of requirements the government

[1] "Federal Research and Development: Funding Has Grown since 2012 and Is Concentrated within a Few Agencies." GAO. U.S. Government Accountability Office, December 15, 2022. https://doi.org/105396.

imposes on private firms and individuals to achieve government's purposes."[1] Many believe that we need these regulations to protect the public's interests. In their minds, science should be no exception. The stance of this paper does not completely disagree with having checks in place to prevent immoral or illegal research from being conducted. If research or experimentation is carried out that undermines/violates another's rights, then it ought to be stopped or punished. However, the practices and research halted by the government's regulatory actions often don't have these legitimate consequences. A good example of this can come from research that the government may find dangerous, but this is not guaranteed:

> Last summer, two research teams funded by the National Institutes of Health genetically modified H5N1 avian influenza viruses, making them capable of efficient respiratory transmission between ferrets. Ferrets are thought to be a good animal model for influenza in humans. A small number of genetic changes might be able to convert the presently zoonotic H5N1 virus into a pathogen with dangerous pandemic potential—transmissible ology and results could become a blueprint for bioterrorism. The U.S. government's request not to publish key scientific findings sparked considerable controversy. To many researchers, knowledge about what mutations enable respiratory transmission is essential to surveillance of and early action against variants of H5N1. They worry that government intrusion into scientific innovation would discourage vital research.[2]

Admittedly this information may have consequences if people were to abuse it. However, that doesn't mean that public knowledge should be limited. Why should only the government have access to such influential information? It shouldn't, the government ought not have the capability to monopolize information. This is what our First Amendment is made to stop. However, this is a piece of economics literature. Normative claims like these possess little weight. Positive claims built upon theory are more useful. These regulations have a similar influence on scientists as subsidization does. Revolutionaries are more likely to follow such regulations out of concern for

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[1] Litan, Robert. "Regulation."1 The Concise Encyclopedia of Economics. Library of Economics and Liberty. http://www.econlib.org/library/Enc/Regulation.html.

[2] Kraemer, John D., and Lawrence O. Gostin. 2012. "The Limits of Government Regulation of Science." Science 335 (6072): 1047–49. doi:10.1126/science.1219215.

punishment. “Failure to meet regulations can result in fines, orders to cease doing certain things, or, in some cases, even criminal penalties.”[1] Those who have more to lose from such punishments are more likely to follow them. Once again, the quacks are another story. These scientists who have little to lose are more likely to be willing to take the risk of breaking a regulation and spreading their research. They are still disincentivized, just not relative to the revolutionaries. A fourth form of intervention is licensing. This method can be used by the government to force actors into meeting certain standards and paying costs before actively participating in a profession. Such a practice seems necessary to ensure the quality of those practicing, but it turns out that licensing is a prominent technique for establishing monopolistic rights. Revolutionaries with licenses would fear having them revoked by the government and would be disincentivized to break through the barriers. Quacks would have a lower chance of possessing a license in the first place so the fear of losing it does not disincentivize them relative to revolutionaries.

Lastly, perhaps the most diabolical form of government intervention. Coercion through government agencies has been particularly noteworthy as of late. During the 2020 election and COVID-19 epidemic, it was made known that:

> the White House press secretary admitted that federal officials were flagging for Facebook “problematic” posts that spread “disinformation.”9 Following White House threats, Twitter suspended the account of a former New York Times reporter, Alex Berenson, for criticizing the COVID-19 vaccines.10 And, beginning during the 2020 election, FBI officials encouraged social media companies to be cautious about misinformation and foreign interference.11 Before the election, the FBI held regular meetings about election misinformation with a broad range of tech companies, “including Twitter, Facebook, Reddit, Discord, Wikipedia, Microsoft, LinkedIn, and Verizon Media.[2]

[1] Litan, “Regulation.”

[2] Grossman, Andrew, and Kristen Shapiro. "Shining a Light on Censorship: How Transparency Can Curtail Government Social Media Censorship and More." BRIEFING PAPER 168 (2023).

These are blatant examples of censorship performed by the American state. The specific acts here are called "censorship by proxy" and make use of the monopoly the government has on legal coercion.[1] Censorship can occur by proxy or directly by government agencies that have their own employed scientists. It seems that this problem doesn't need much dialogue relating to the scientists acting in the established graph. The problem has already been explained. Scientists outside of the status quo are accused of spreading false information. They are then silenced by private organizations (proxies) such as Twitter being threatened by the government. If Twitter had decided to censor these scientists on their own, then there would be no issue. However, the government being involved in manipulating private organizations is an abuse of its power. This form of government regulation would seem to affect both sets of actors similarly. Both would end up being silenced for breaking out of the status quo. However, there are underlying consequences of censorship that may affect them differently. Reputation is exceptionally important for those working in scientific fields. Being silenced on social media can often be followed by "cancellation" for one's non-typical views. A revolutionary has much more to lose from being silenced than a quack. The quacks already have a less-than-ideal reputation in their field of study. So being silenced has far fewer ramifications for a quack. An example of how rampant this issue of Government overreach into freedom of speech by proxy comes from Matt Taibbi. Taibbi is one of three winners of the *Dao Prize for Excellence in Investigative Journalism* and gave a speech which he later documented in an article. In it, he explains the current state of Journalism. He exclaims that it "has become hopelessly politicized in recent years. Editors now care more about narrative than fact, and as many of the people in this room know, there are now

[1] Grossman, Andrew, and Shapiro, "Shining a Light on Censorship: How Transparency Can Curtail Government Social Media Censorship and More."

fairly extreme penalties for failing to toe party lines."[1] Taibbi's critique of what the profession has regressed into affirms the claims being made in this paper. His speech sheds light on just how rampant and relevant this issue is. Government agencies can also directly silence or cancel these researchers by making use of the third group of actors/scientists in our framework. This group is made up of "status quo scientists" who are employed by government agencies and actively practice the knowledge the government supports. They too attempt to explain inconvenient truths, but only by using knowledge within the status quo. There are two options for why these scientists have decided to support the state-made standard. First, they truly believe that the anomaly/inconvenient truth can be solved/explained by the current set of knowledge. Second, they are reliant on the methods the government makes use of to form the barriers of their standard. Which category they belong to is of little consequence to the government. They can be used all the same to cancel and oppose the other two groups.

To summarize, the framework that this paper is built upon has a plethora of components. Those in society are moving across time and have a certain understanding of scientific knowledge at any given point. The government standardizes this knowledge by forming barriers through intervention. Whenever a problem arises that cannot be explained by the government's standardized status quo there are three groups of scientists that seek to explain it for various reasons. The methods used disproportionately disincentivize revolutionaries from acting outside the established parameters rather than quacks. This effectively slows down scientific progression and makes the process inefficient. Being a theoretical framework, most of the claims made are yet to be proven or supported sufficiently.

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[1] Taibbi, Matt. "Dao Prize Acceptance Speech." Dao Prize Acceptance Speech - by Matt Taibbi, Racket News, 2 Nov. 2023, www.racket.news/p/dao-prize-acceptance-speech?publication_id=1042&post_id=138514493&isFreemail=true&r=9atnc.

Standing on the Shoulders of Giants

To support the framework that has been laid out in the previous section and affirm that this problem is relevant to today's society I will be drawing on numerous influential authors. With the framework being centered around scientific progression it is natural to start with Thomas Khun. In his book, *The Structure of Scientific Revolutions* Khun provides an in-depth model of humanity's progression through science over time. The framework of this paper is similar and essentially builds off Khun's framework. This paper does not cover all the same topics found in Khun's book. The relevant aspects will be taken and compared to build support.

The first part of Khun that grounds this paper's framework is his development of the "paradigm".[1] He defines a paradigm as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners." Essentially a set of beliefs and principles built upon achievements that current scientific knowledge and research depend upon. Khun describes scientists as "puzzle-solvers".[2] The "puzzles" that they are solving are problems that require research and experimentation to solve.[3] Unlike puzzles there may arise scientific problems that simply do not have an end solution, but scientists search for them all the same.

Khun then develops his model further adding the concepts of "anomaly" and "paradigm shifts".[4] Here lies the issue of a puzzle that cannot be solved. It may seem like the puzzle is unsolvable under the current paradigm. However, it turns out that often the issue lies in the

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[1] Kuhn, Thomas S., and Ian Hacking. 2012. "The Structure of Scientific Revolutions." Fourth edition. The University of Chicago Press. https://search.ebscohost.com/login.aspx?direct=true&db=cat04264a&AN=hbl.290547&site=eds-live&scope=site.

[2] Kuhn, Thomas S., and Ian Hacking, "The Structure of Scientific Revolutions."
[3] Kuhn, Thomas S., and Ian Hacking, "The Structure of Scientific Revolutions."
[4] Kuhn, Thomas S., and Ian Hacking, "The Structure of Scientific Revolutions."

foundations of the current paradigm that are insufficient to propose an answer. Khun calls the unsolvable puzzle an anomaly. After repeated attempts to solve the anomaly eventually the core principles of the paradigm are questioned. This leads scientists to form new principles that may fare better than the old. If the new paradigm finds success in solving the anomaly and more people acknowledge it, then the old paradigm begins being pushed out. Khun defines this process as a paradigm shift. The failure of an old paradigm to solve an anomaly is accompanied by the discovery/formulation and acceptance of a new paradigm. However, the new paradigm does not prevail without difficulty. Recently discovered paradigms are strongly resisted by the established community. Naturally, a scientist would defend the principles and achievements that have governed their life's work. According to Khun this process continues and repeats throughout history. This is his explanation of society's scientific progression.

This paper's framework assumes Khun's idea of paradigms to be true. The assumption adds a piece to the framework that didn't feel appropriate to discuss without first mentioning Khun. The added piece is another set of barriers that are present in Khun's paradigm. Paradigm barriers are devoid of government intervention. They are naturally occurring and inherent to the nature of paradigms. Natural barriers are formed by the collective belief held by the practitioners of the paradigm. If someone were to do research or make claims based on knowledge that goes against the current paradigm then they would be left at the mercy of the central populace of scientists who accept it. Anomalies are also present in the framework labeled as inconvenient truths. Another similarity is the presence of natural barriers created by the scientists of the old paradigm. The major difference between Khun's framework of scientific progression and the one in this paper's first section is the inclusion of government. Even without the presence of the

government, the process of shifting paradigms is slow and costly. The main point of this paper is to explain how the government slows down this process even more.

The second set of shoulders supporting this paper belongs to Bryan Caplan. By referencing Caplan's works I will be able to properly show the ignorance of the public and emphasize the importance of this issue. Caplan's book *The Myth of the Rational Voter* details how average citizens in society generally hold views that are inconsistent with experts leading to irrational voting.[1] In his work, Caplan speaks mainly about economic issues. I don't see why the public's views on scientific research would be any more informed. If citizens are ignorant on economic issues important enough to affect policy, then they most likely are ignorant to scientific research trying to solve anomalies. I theorize that if the fact that the current status quo/paradigm is not able to explain an issue is made public knowledge then people will start searching for answers. These ignorant citizens will then find themselves looking up research studies to find answers. However, according to what we have established so far most of the studies and research they find will be from status quo scientists and quacks. They already have an inkling that the status quo is failing so what are left with? Quacks!

Hayek's work *The Intellectuals and Socialism* is the third piece of literature I will use to support the relevance of this problem. In his work, Hayek emphasizes the importance of intellectuals and their impact on the direction of society.[2] Hayek defines intellectuals as "professional secondhand dealers in ideas".[3] He claims that the general socialist trends of

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[1] Caplan, Bryan Douglas. 2007. The Myth of the Rational Voter : Why Democracies Choose Bad Policies. Princeton University Press. https://search.ebscohost.com/login.aspx?direct=true&db=cat04264a&AN=hbl.236711&site=eds-live&scope=site.

[2] Hayek, Friedrich August. "The intellectuals and socialism." The University of Chicago Law Review 16, no. 3 (1949): 417-433.

[3] Hayek, Friedrich August. "The intellectuals and socialism."

intellectuals in democratic countries have a major effect on the direction that the country follows. I would argue that scientific researchers are essentially the equivalent of these intellectuals. They are second-hand dealers in the sense that they do not always make the discovery but still devote themselves to learning about it. Often, they make a living using the information of discoveries and have a stake in them. In a very similar way to how Hayek argues that they have a large influence on the direction of society, this paper asserts that scientists have a very significant influence as well. Hayek analyzes how the intellectuals he speaks about judge new ideas not by their specific merits, but by the readiness with which they fit into their general conceptions, which are often derived from the most recent scientific achievements or catchy phrases. This point seems relevant as status quo scientists would be readily willing to accept new research or ideas based on whether they fit within the standard the government has set around the current paradigm. Not based on its merit, but based on whether it supports the current system that is benefiting them. This is a problem if the trends of scientific research are more than often determined by quacks and status quo scientists. I don't believe that policy will end up being dictated by the poor science of quacks or stagnating research of the latter. Nevertheless, the resulting confusion and lack of development could potentially be detrimental.

Economic Consequences

Government intervention has been the topic of economic literature for centuries. The field of scientific research is no different. Rothbard's *Power and Market* will be the source of this paper's economic theory. His book focuses on the effects of government intervention on the economy. Making it perfect for helping to explain the consequences of the government's intervention in scientific inquiry. Rothbard endorses a free market economy and believes that the

natural processes govern/protect it from corruption.[1] It should be noted that these consequences are just as relevant when discussing the domain of science. Economics is the study of human action and cooperation in the pursuit of a more ideal state of being. Scientific inquiry is a form of human action and cooperation that involves pursuing a more ideal state of knowledge and understanding of things in this world. Meaning that economic analysis can be done on that which influences this field.

Rothbard defines intervention as any action by the government that interferes with the voluntary market exchanges of individuals or groups of individuals. He distinguishes between three different types of intervention: Autistic, binary, and triangular.[2] Rothbard analyses the specific intervention methods that fit under these three types. I will be explaining how the methods that the government uses to form the barriers in our framework fit under Rothbard's classifications and therefore share their consequences.

As previously mentioned, the first method of intervention discussed was subsidization. This method of intervention is listed under the binary category. In our context, Rothbard's argument would follow that the introduction of subsidies allows for funding to be allocated based

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[1] Thus, a truly free market is totally incompatible with the existence of a State, an institution that presumes to "defend" person and property by itself subsisting on the unilateral coercion against private property known as taxation. On the free market, defense against violence would be a service like any other, obtainable from freely competitive private organizations. Whatever problems remain in this area could easily be solved in practice by the market process, that very process which has solved countless organizational problems of far greater intricacy. See more at Rothbard, Murray Newton. Power and market. Ludwig von Mises Institute, 1970.
See more at Rothbard, Murray Newton. Power and market. Ludwig von Mises Institute, 1970.

[2] . In the first place, the intervener may command an individual subject to do or not to do certain things when these actions directly involve the individual's person or property alone. In short, he restricts the subject's use of his property when exchange is not involved. This may be called an autistic intervention, for any specific command directly involves only the subject himself. Secondly, the intervener may enforce a coerced exchange between the individual subject and himself, or a coerced "gift" to himself from the subject. Thirdly, the invader may either compel or prohibit an exchange between a pair of subjects. The former may be called a binary intervention, since a hegemonic relation is established between two people (the intervener and the subject); the latter may be called a triangular intervention, since a hegemonic relation is created between the invader and a pair of exchangers or would-be exchangers.
See more at Rothbard, Murray Newton. Power and market. Ludwig von Mises Institute, 1970.

on how well someone can affirm the status quo. This makes it so that research and discovery outside of the parameters is not encouraged and an inefficient process is supported.[1] This is consistent with previous remarks from Hayek about intellectuals accepting new ideas not based on merit. The government will subsidize research not based on its contributions but based on how well it fits into the status quo. Resulting in more status quo scientists attempting to garner more funding not through good science but politically appeasing research.

The second method listed is regulation. This barrier factor would fall under autistic intervention. The main consequence of this type of intervention is loss of utility. Rothbard claims that all intervention results in a loss of utility for the party intervened upon.[2] Regulation results in the most amount of utility lost. Due to the party being forced to either take or refrain from taking an action without receiving anything in return. In the other various forms of intervention, there is often either some sort of exchange or another beneficiary. Without payment whatsoever, the act of regulating information and practice eliminates utility for those being affected.

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[1] On the free market, wealth is only a resultant of the voluntary choices of all individuals and the extent to which men serve each other. But the possibility of government subsidy permits a change: it opens the way to an allocation of wealth in accordance with the ability of a person or group to gain control of the State apparatus. Government subsidy creates a separate distribution process (not "redistribution," as some would be tempted to say). For the first time, earnings are severed from production and exchange and become separately determined. To the extent that this distribution occurs, therefore, the allocation of earnings is distorted away from efficient service to consumers. Therefore, we may say that all cases of subsidy coercively penalize the efficient for the benefit of the inefficient. See more at Rothbard, Murray Newton. *Power and market*. Ludwig von Mises Institute, 1970.

[2] Coercive intervention, on the other hand, signifies per se that the individual or individuals coerced would not have done what they are now doing were it not for the intervention. The individual who is coerced into saying or not saying something or into making or not making an exchange with the intervener or with someone else is having his actions changed by a threat of violence. The coerced individual loses in utility as a result of the intervention, for his action has been changed by its impact. Any intervention, whether it be autistic, binary, or triangular, causes the subjects to lose in utility. In autistic and binary intervention, each individual loses in utility; in triangular intervention, at least one, and sometimes both, of the pair of would-be exchangers lose in utility.
See more at Rothbard, Murray Newton. Power and market. Ludwig von Mises Institute, 1970.

Rothbard shines light on the practices of licensing and how they can contribute to the formation of monopolistic tendencies within fields where they persist.[1] The presence of licenses automatically deters entry into the field and also creates a mechanism through which the government can exert influence on parties with licenses. The threat of revoking licenses is real and would disincentivize people from acting in ways that undermine government-established parameters. On the other hand, the bequeathing of licenses can be an outlet for government-granted monopolies. This can occur in science as well, as the government can create licensing for scientific practice and certain research. By granting these to those that support the status quo they end up creating a monopoly in inquiry. It is a universally accepted view that monopolies are undesirable.

The fourth and final method discussed is coercion through government agencies. Rothbard sees the government as "an institution of coercion that interferes with voluntary relations in the market." He condemns coercion and the government's use of it. The free market that he advocates for cannot exist alongside a government or state that possesses a monopoly on coercion. Rothbard distinguishes between coercion in private exchanges and coercion done by the government through threat of violence.[2] The main difference is the option of choice. Violent

[1] Licenses deliberately restrict the supply of labor and of firms in the licensed occupations. Various rules and requirements are imposed for work in the occupation or for entry into a certain line of business. Those who cannot qualify under the rules are prevented from entry. Further, those who cannot meet the price of the license are barred from entry. Heavy license fees place great obstacles in the way of competitors with little initial capital. Some licenses such as those required in the liquor and taxicab businesses in some states impose an absolute limit on the number of firms in the business. These licenses are negotiable, so that any new firm must buy from an older firm that wants to go out of business. Rigidity, inefficiency, and lack of adaptability to changing consumer desires are all evident in this arrangement. The market in license rights also demonstrates the burden that licenses place upon new entrants. See more at Rothbard, Murray Newton. Power and market. Ludwig von Mises Institute, 1970.

[2] A well-known type of "private coercion" is the vague but ominous-sounding "economic power." A favorite illustration of the wielding of such "power" is the case of a worker fired from his job, especially by a large corporation. Is this not "as bad as" violent coercion against the property of the worker? Is this not another, subtler form of robbery of the worker, since he is being deprived of money that he would have received if the employer had not wielded his "economic power"? Let us look at this situation closely. What exactly has the employer done? He has refused to continue to make a certain exchange, which the worker preferred to continue making.

coercion from the government takes away the coerced party's voluntary choice. According to Austrian Economics when exchanges are not voluntary at least one party involved will lose. The government made use of agencies to coerce social media platforms into silencing people. This resulted in a loss for the platforms and people who used them. Less people trusted the platforms which resulted in less usage and those who were silenced were not able to gain recognition for their claims.

The barrier-forming methods employed by the government all have negative economic consequences. Subsidization results in inefficiency and stagnating practices/research. Regulation sees the highest loss of utility when used. Licensing encourages the formation of monopolies. Finally, coercion through government agencies takes away voluntary exchange resulting in losses and desired ends not being met by certain parties involved. The economic consequences of these methods combined with how they tend to slow down scientific progress through the resulting incentives of various actors paints a dim picture of government intervention in the field of science.

Inquiry: Open vs. Restricted

Considering the constructed framework, background, and economic consequences related to government intervention in science, would open inquiry be more efficient than the current system? To answer this question, we must recognize the differences between open and restricted inquiry and determine which is superior.

Specifically, A, the employer, refuses to sell a certain sum of money in exchange for the purchase of B's labor services. B would like to make a certain exchange; A would not. The same principle may apply to all the exchanges throughout the length and breadth of the economy.
See more at Rothbard, Murray Newton. Power and market. Ludwig von Mises Institute, 1970.

The main difference can be seen by comparing this paper's devised framework and Khun's work on the idea of paradigms. The difference is boundaries. As stated previously, two types of boundaries exist. Under restricted inquiry both forms of boundaries are present. Here government intervention forms artificial barriers around the generally accepted paradigm. These barriers make scientific progression significantly more difficult than it otherwise would be. This is done through the various methods expounded upon earlier in the paper. Revolutionaries are relatively more disincentivized from attempting to solve a persisting issue that cannot be resolved by the current standard set of principles. The artificial barriers do little to disincentivize quacks from performing poorly conducted scientific research. In addition to these artificial barriers, there are natural barriers present. I would argue that these natural barriers are enough to adequately stop the low-quality research and science done by quacks. The presence of artificial barriers is unnecessary and does more harm to the progression of science than it helps stop malpractice and research.

Specific examples of the benefits of having open inquiry have already been stated. However, to fully understand the difference between the two states of inquiry I will list them all here. Under open inquiry where there is no government intervention the artificial barriers cease to exist. The disproportionate harm done to revolutionaries isn't present. I cannot confidently say that natural barriers sufficiently stop quacks from spreading false information when attempting to explain anomalies. However, the analysis shows that these government-made barriers fail to be as comparatively effective as natural barriers. Essentially, they are not worth the cost incurred. The economic consequences that come about from government intervention would not be present. Overall efficiency in scientific progress and research would increase under open inquiry. Utility would be maximized since the system would mimic a free market where people act

voluntarily in mutually agreed upon exchanges. This is because there would be no monopoly on coercion through violence. The only real concern of having no government intervention is unrestrained research and practice that falls closer to the end of falsehood. These actions are naturally restrained by the general group of practitioners in a given paradigm. As stated previously, there would likely be relatively fewer quacks influencing the public under open inquiry than under restricted inquiry.

Final Judgments

In drawing to a close, government intervention harms the progression of science by hampering open inquiry through various methods, thus mistakenly labeling any scientist researching outside of their proposed standard as a sort of "quack" and subsequently Ceteris Parabis generating more false information while limiting true information. This theory is supported by the framework constructed in the first section. Government intervention forms barriers that harm good actors more than it stops bad actors when trying to solve problems that the current paradigm cannot explain. Thus, producing more explanations that fall closer to the falsehood end of the spectrum than those that progress science further toward truth. The framework is supported by and grounded in Khun's model of the paradigm. Caplan and Hayek's works are being used to explain why this problem would have a significant effect on our society. Since this is carried out through government intervention there are numerous economic consequences illustrated by principles from Rothbard. When comparing open and restricted inquiry and the theoretical benefits of the former, certain conclusions can be drawn. Open inquiry is more efficient/beneficial for society and scientific progression. Government intervention, at least in the field of science perpetuates the very problem it seeks to stop.

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