A GENEALOGY OF EPISTEMOLOGICAL JUSTIFICATION:

How the Protestant Reformation and Scientific Revolution contributed to modern theories of justification

By: Darrah May Moul

Submitted to: Central European University Department of Philosophy

In partial fulfilment of the requirements for the degree of Master of Arts

Supervisor: Professor Tim Crane

Vienna, Austria

ABSTRACT

Using a genealogical methodology, this thesis argues that the Protestant Reformation and Scientific Revolution brought about significant changes in the way that we view the justification of knowledge today. Building on work by Peter Harrison, and looking at the views of Martin Luther, Galileo Galilei, Francis Bacon, and Thomas Sprat, I illustrate some of the mindset changes which occurred during these revolutions and show how they support theories from modern epistemology. I focus on two theories of epistemological justification: process reliabilism and evidentialism. First, utilizing Harrison's summary of how views of nature changed leading up to the mechanistic worldview which characterized the Scientific Revolution, I show how reliabilism requires this view of nature in order to operate. Second, I trace the changes in authority as the aforementioned revolutionaries challenged the power of the church and of the ancient philosophical canon, and made nature the new standard of reference instead. I argue that this provides support for our modern-day usage of evidentialism. To my grandmothers, for whom this degree was never an option.

And to my parents:

My mom, who loved intellectual history before I did

And my dad, who never got a college graduation, but helped me get two. Now I have an extra one. This one is for you.

TABLE OF CONTENTS

Preface	1
Chapter 1: Introduction & Methodology	6
Methodology	8
Chapter 2: Reliabilism	11
Reliabilism	11
Changing Views of Nature	15
Reliabilism and the Mechanistic Worldview	19
Chapter 3: Evidentialism	21
Evidentialism	21
A Brief Interlude	25
Movement 1: Luther challenges the Church	27
Movement 2: Galileo challenges the Church	
Movement 3: Challenges to the philosophical canon	31
Movement 4: Making nature the new authority	
Connecting to Evidentialism	
Conclusion	
References	42

PREFACE

The impetus for this paper does not come from an attempt to say something new about the Protestant Reformation or Scientific Revolution. Nor do I claim to have any novel insights about reliabilism or evidentialism. My vision is rather to connect the two in a new way. While these aspects of history and epistemology are fairly familiar, they are not often explicitly linked. However, no academic discipline evolves in a vacuum. The cultural attitudes, intellectual movements, and co-occurring revolutions of the day can have a distinct influence on developing theories, as I argue is the case here in epistemology. These forces are often difficult to identify in the present, since our minds are not trained to question certain presuppositions. They become more available to scrutiny when we look back in time to when they were not considered so obvious. What I ultimately want to explore in this thesis is more fundamental than history, religion, science, or epistemology alone. What I plan to trace are the changing ways that humans approach the justification of knowledge, and the (sometimes unlikely) forces which exert influence in this arena. Specifically, I will show some of the historical mindset shifts that I believe played a supportive role in the development of contemporary reliabilist and evidentialist theories of justification.

A major inspiration for this work comes from Peter Harrison's (1998) book, *The Bible, Protestantism, and the Rise of Natural Science*. Here Harrison outlines the changes in how early natural philosophers approached nature, and how the Protestant Reformation impacted this. For example, he describes how the physical world was once a repository of signs, studied not in order to understand their own functioning or relations, but rather to draw out Biblical implications. He discusses the rise of literalism, and how this cut off the typical method of interpreting the world. His argument, as I read it, is that the Protestants affected the study of nature in two main ways: first, their literal reading of the Bible encouraged a

literalist mindset in which physical objects no longer *refer* to other things or truths. This left the door open for a new approach to nature, an opportunity that Galileo and others were more than happy to take up. The second Protestant move that impacted emerging science was their challenge to the Catholic Church's authority. By making the Bible more accessible and questioning the Church's word on various religious issues, the Protestants began clearing the way for others to question Church doctrine on matters concerning the natural world.

I will rely heavily on Harrison's work throughout this thesis, for two primary reasons. The first is because of his lucid presentation of how people thought about nature before the emergence of science as we know it, and how this changed over time. Tracing this history will help us understand the path that led to the present. Second, Harrison's linking of Protestant mindsets to early scientific ones allows us to step out of the silos of either "religion" or "science" and take a broader view. My goal in the pages that follow is to consider how views of knowledge evolved as a whole, without limiting ourselves to this or that modern discipline. I build on Harrison's work by showing how I think the historical *zeitgeist* shifts that he identifies relate to more modern work in epistemology. In this way, Harrison's work will reappear throughout, but with additional examples from other authors in order to illustrate the trends I discuss. Galileo's (1615) letter to the Grand Duchess Christina will provide an insight into his views as I consider how he fits into the historicalepistemological space that I consider. Silvia Manzo's (2006) paper on "Francis Bacon: Freedom, authority and science" allows us to place Bacon on the scene, in addition to Thomas Sprat via his (1667) *History of the Royal-Society of London*.

Another work which has heavily influenced my thoughts on this topic is chapter six of James Bono's (1995) book, *The Word of God and the Languages of Man*. In this section, Bono points out Galileo's rhetorical strategy of removing himself out of the position of an author, and instead attributing authorship to nature (and therefore God). By rejecting what he

deemed the over-complicated work of his competitors in favor of a more direct encounter with nature, Galileo attempts to lend his proposal an almost divine weight, decrying the distastefully human inventions of his contemporaries. This interpretation of Galileo's strategy led me to consider how authority was changing hands during this time period, which has everything to do with the justification of knowledge.

Finally, an informative paper by Frederik van Niekerk (2020) entitled "Reformation and Scientific Revolution: Historical coincidence or continual renewal?" gives a helpful overview of a variety of perspectives on the relationship between these two historical events.

Here I would like to offer a brief terminological note. I will use the word "authority" many times throughout this paper. In an epistemic context, this may be slightly confusing. I do not mean to refer to the realms of epistemology that have to do with testimony and trust. I use the term "authority" to indicate the force or the weight that a certain hypothesis can have, so that I can consider the sources of this power. The goal of this thesis it to track which methods or entities are considered to have the most strength, and to note when this power changes hands.

On the topic of terminology, I owe another clarifying point. The word "science" is difficult to use well in historical contexts. Our tendency to retrospectively label various movements or activities with this term is often incorrect. It can be argued that even in this case, where the Scientific Revolution is specifically part of our subject matter, the term is used falsely, since both the discipline of science and the term "scientist" were not utilized as we know them until much later (Harrison 2006). Therefore, I make an attempt not to multiply any ahistorical errors. I use the labels "natural philosophers" and "early scientists" to refer to those who were studying nature during the 16th and 17th centuries. When I use the term "science," I typically include the modifier, "as we know it" to indicate the backward-looking

aspect of the label, which, if used then, may not have held the same meaning that we attribute to it today.

For my epistemological knowledge, I have relied on major encyclopedias and papers that I take to be main proponents of that view. For reliabilism, I utilize a (2012) reprint of Alvin Goldman's 1979 article, "What is Justified Belief?" This I supplement with Wayne Riggs' (2002) article, "Reliability and the Value of Knowledge." During my discussion of evidentialism, I contextualize it within Earl Conee and Richard Feldman's article, "Evidence," in Quentin Smith's 2008 anthology. Richard Popkin's (2003) *The History of Scepticism* has also been a great use to me in understanding Luther.

The final disclaimer that I will offer is that, while I will be arguing for similarities in some of the changes that occurred during the Protestant Reformation and Scientific Revolution, we must be careful not to over-generalize. The natural philosophers that I will consider here were not necessarily protestants. Galileo certainly was not; he received guidance from his contacts in the Catholic Church (Brooke 1991, pp.101-102), and wrote that his only purpose was that if

there is anything that may be serviceable to the holy Church in making a decision concerning the Copernican system, it may be taken and utilized as seems best to the superiors. And if not, let my book be torn and burnt, as I neither intend nor pretend to gain from it any fruit that is not pious and Catholic (Galilei 1615, p.3).

Despite the ensuing conflict between Galileo and the Church which would come to characterize their involvement, Galileo's intentions were certainly not to antagonize the Catholic Church. Neither should it be assumed from my arguments here that Protestants were always supportive of early scientific developments, since this was not the case (Brooke 1991, 100). The similarities that I wish to highlight have to do with the broader mindset shifts that each brought about, whether individually or together. This should not be taken as an indication that either revolution showed any sustained intention or effort to accommodate each other specifically.

CHAPTER 1: INTRODUCTION & METHODOLOGY

In this thesis I will address the following question: how did the major 16-17th century revolutions (specifically, the Protestant Reformation and Scientific Revolution) affect our present-day practice of epistemology? I think that the modern mind has taken for granted a number of key aspects of knowledge production and possession, elements that were clearer during these historical movements since they were not so common place. Examining these movements reminds us of the tacit commitments we have made and where they originated.

With the benefit of hindsight, reading about the Protestant Reformation and Scientific Revolution has a distinctive weight to it – an air of acute importance, knowing that these events changed the world. Scholarship carried out by many thoughtful historians allows us to trace through the ages the effects of Galileo's experiments or Martin Luther's theses. Entire authority structures were challenged, novel methodologies arose, amalgamated fields of study detached into more distinct disciplines, and science as we know and rely on it today began to take shape. Yet from a philosophical perspective, not even this seems to adequately capture the magnitude of the mindset shifts that took place during the 16th and 17th centuries. Changes this seismic – moving from ecclesiastical dominance to individual access to truth, from allegory to literalism, from an Aristotle-led canon to evidentialism – are difficult to sufficiently appreciate in a culture so accustomed to their existence. Reading about Luther's reforms and Galileo's budding science is like reading about the modern world when it was still brand new and, to many, unacceptable. If we are patient enough to look deeper into this early modern picture, we see many of our present-day assumptions and axioms staring back at us, and often in high contrast since their proponents had to fight for their acceptance.

It is just this opportunity that I would like to take advantage of: the chance to peer back in time and see where today's commonplace presumptions came from. The purpose of

the investigation is to locate contemporary approaches to justification in the broader space of intellectual history, examining their early modern underpinnings. I will focus on two transformations in thought that occurred during the Protestant Reformation and Scientific Revolution, and I will connect these to two major approaches to justification in modern-day epistemology. The first historical change that I will address is the emergence of a mechanistic worldview, in which nature is inherently law-governed. I will show how this is in fact a prerequisite for reliabilism, which is the assumption that we can trust certain processes to lead us to knowledge. The second shift that I discuss is a reconfiguration of authority structures. Luther's demotion of church leaders, and Bacon's call to creativity instead of blind adherence to ancient authorities, both paved the way for nature to become the standard of evaluating science rather than the judgment of ecclesiastical or ancient superiors. This, I argue, is an evidentialist move: when the standard of knowledge must align with nature instead of an esteemed individual or group.

The theories of justification that I discuss here are a part of a larger debate between two approaches to justification: internalism and externalism. Internalists argue that what justifies a belief must be available to the believer upon reflection. Externalists do not impose this requirement. Reliabilism is often considered a form of externalism about justification, and evidentialism is typically a part of the internalist camp. This is not by necessity, however, and the relationships here are much more nuanced. The main brunt of my argument does not have to do with internalism or externalism. I mention this in order to locate my work in the larger discussion, but also because I think it helps to convey the scope and significance of this thesis. The issues at hand are not rare, isolated examples of how Luther and Galileo and the like happened to have a siloed impact on epistemology. No; theorists in both internalist *and* externalist camps can trace part of their lineage back to these early modern reformers. Their influence is varied and has effected significant change in many different ways, different

enough to shape even two opposing viewpoints. In case we needed convincing, this only further confirms that the innovations of these two revolutions are found as much in their underlying approach as in their content (if not more so).

Methodology

Put simply, my primary thesis is that two major camps of modern epistemologists owe a substantial debt to the Protestant and Scientific revolutionaries of the 16th and 17th centuries. This may seem rather obvious, since the Enlightenment era which followed right on the heels of the Scientific Revolution quite assuredly set the stage for much of modern thought. I have no quarrels with this. My project is to be more specific; to dig past the Enlightenment itself and look a little further back, tracing the initial movements and attitude changes which create the logical foundations required for modern theories. It should be noted that I am not claiming to list all of the conditions which contributed to the development of reliabilism and evidentialism. Rather, I am pointing out a few events that perhaps are not even necessary, but that did occur and did help to set the conceptual stage for two modern approaches to justification.

In this way, then, the present thesis could be considered a genealogy of sorts. Edward Craig (2007, p. 184) describes a genealogy as "the story of how something or other (a practice, a concept, a system of beliefs, a political constitution) came about." It is similar to a history, but differentiated in that it contains more than pure description. A true genealogy seeks to help us understand *how* the end point in question came to be – it aims at providing "a sense of the development of the stages out of their predecessors" (Craig 2007, p. 184).

A few different philosophers have utilized a genealogical method in the past, and in varying forms. Their differences will help to explain what I do and do not plan to accomplish.

What I do *not* intend to do is to draw any normative conclusions from this study, as Friedrich Nietzsche or Bernard Williams did in their respective genealogies (Koopman 2009). My participation in the genealogical tradition will be more like that of Michel Foucault, who did not aim at making moral judgments, but rather used his genealogies to "problematize:" "to open these problems up to more rigorous forms of critical scrutiny" (Koopman 2009, p. 101). This is the approach I plan to emulate. I do not take the process of problematization as implying that the theories I will discuss are themselves *problematic*, in the sense of being illogical or utilized incorrectly. I see this only as a chance for further understanding, problematizing being the method of selecting a thing for extensive study. To problematize, in the sense that I will perform the action, merely means to set a thing on the workbench and pull up a stool.

Knowing the developmental story of an entity helps us to understand it. When we consider the path towards evidentialism, for example, it is easier to see the arguments that it is built upon, ones that we rarely have reason to consider today since they are largely taken for granted. By tracing the emergence of a concept or theory, we can consider what had to happen in order for that theory to make sense, and what mindsets needed to be implemented in order for it to garner widespread adoption. The goal is to remember that knowledge has a lineage and a conglomeration of sources; even things which may seem obvious or "objectively true" did not appear to us fully formed. If the following analysis feels like a critique in any sense, it is only because history reminds us of the ever-changing nature of science and society: those conclusions which may appear obvious to us now were not always so undeniable. This fact may suggest the possibility that arguments which seem indisputable today may not be so in the future. This is humbling, to be sure, but is not unique to the topics discussed in this thesis, and therefore should not be taken as a specific criticism of them.

Another way in which my work can helpfully be considered a genealogical exercise is in the multiplicity of explanations. What I mean is this: picture, if you will, the root system of a tree. Consider yourself as the tree, and the roots as your ancestors. The roots divide themselves naturally into clumps: one clump might represent your family on your mother's side, another clump, your father's ancestry. The convergence of many of these bundles culminates in you. The same can be said of the epistemological theories that I will analyze here. Take evidentialism as an example again. I am going to argue that certain facets of the Protestant Reformation and Scientific Revolution helped to support the widespread usage of evidentialism in modern study. However, this should not be taken as a complete account of its emergence. What I set about untangling here is only one of the "root clumps". Evidentialism certainly did not come only from the likes of Luther and Galileo and Bacon; it existed long before then. There are other root bundles supporting the tree that I do not address in this paper. The history of evidentialism is as complicated as any of our own family trees. Yet, as long as we can keep this in mind, it does not pose a problem. There is much that we can learn from this portion of the lineage.

CHAPTER 2: RELIABILISM

The first connection between the early modern revolutions and contemporary epistemology that I will discuss considers the process reliabilist's approach to justification. In this chapter, I will show that process reliabilism requires the belief that the world is consistently governed by laws or regularities. This view of the world took hold during the Scientific Revolution, but according to some authors, also has roots in the Protestant Reformation. In order to show this, I will briefly present Harrison's account of how man's approach to nature changed throughout history. We will see how the church took a Platonic approach early on, which then gave way to an allegorical interpretation of the natural world. Luther initiated a shift to literalism in order to stabilize his reliance on Biblical authority, and this opened the door for the developing mechanistic sciences to assert their dominance (Harrison 1998). The view of the world as mechanistic, or stable and predictable, provides the grounding that reliabilism demands. In this way, then, I trace this precondition of reliabilist thought back to the 16-17th centuries, noting the factors that support it and its fit with a growing Protestantism.

Reliabilism

In contemporary studies of knowledge, it is generally accepted that knowledge is true belief plus something else. In order to deserve the label "knowledge," the person must have a belief, the belief must be true, and there must be some other *something* that provides justification for the belief, and accounts for our intuitions when a true belief should not count ask knowledge. As even Socrates states, "true opinion" is not enough for knowledge (Ichikawa and Steup 2018). There are a number of suggestions for what form this

justification might take. A few major strategies (in no particular order) include foundationalism, reliabilism, coherentism, and evidentialism. This paper will consider two of these forms of justification: reliabilism in this chapter, and evidentialism in the next. (I will be considering process reliabilism specifically; hereafter simply "reliabilism.")

Reliabilism is often (though, not by necessity) considered a form of externalism about justification. What is important to the externalist is not whether the justification is something the believer can be aware of, but rather the connection between the belief and the external world, which may not be clearly accessible to the knower. This relation can take a number of forms – in addition to a belief being directly caused by events in the world, externalists sometimes emphasize reliable belief-forming procedures (Poston n.d.). While these processes don't *have* to produce true beliefs – they are still defeasible – they need to at least do so *reliably. Reliabilism* about a process means that this specific method of belief formation "produces either mostly true beliefs, or a high ratio of true to false beliefs" (Becker n.d.). Beliefs formed by this process can be considered justified.

One of the early proponents of reliabilist epistemology was Alvin Goldman (Goldman and Beddor 2021). In his paper "What is Justified Belief?" Goldman (2012, p. 36) argues that the problem with existing notions of justification is that they failed to account for the causal process behind a belief, which leaves open the possibility that true beliefs might come about in some objectionable way. Examples of this are "confused reasoning, wishful thinking, reliance on emotional attachment, mere hunch or guesswork, and hasty generalization" (Goldman 2012, p. 37). When these approaches are at play, we may have a true belief to which we would not want to attribute justification. What is wrong with these methods? They are *unreliable* – they lead to wrong results too much of the time (Goldman 2012, p. 37). Therefore, if we need a causal account that excludes these processes, Goldman (2012, p. 37) argues that "the justificational status of a belief is a function of the reliability of the process

or processes that cause it." Examples of these acceptable processes include memory, sense perception, good use of logic, and introspection (Goldman 2012, p. 37).

More recently, Wayne Riggs (despite not subscribing to the sufficiency of the reliabilist picture) argues for the value of reliabilism. If knowledge is a good, "the production of the good in a non-accidental way is more valuable than its accidental production," Riggs (2002, p. 89) writes. Because we are not in total control of our world, every piece of knowledge that we have has some element of accidentality to it (for example, we could have been detained on the way here, which would have prevented us from forming some true belief) (Riggs 2002, p. 91). However, accidentality comes in degrees, some of which are admitted into the category of knowledge, and some which preclude this label (Riggs 2002, p. 91-94). This is an additional example of contemporary support for a reliabilist approach to justification.

Reliabilism requires an additional feature in order to function as intended. If we are going to base our justification on a process that has yielded true beliefs in a sufficiently high number of past instances, then we need some assurance that this will continue to be the case in the future. We can only know this if we can count on the world to continue abiding by the same rules that it has in the past. Unforeseen changes or erratic events would mean that we would not be able to trust a process, since we could not predict whether it would continue to function in the future as it has in the past. If our sensory experiences under optimum conditions were trustworthy one day but utterly deceptive the next (under the same conditions), then we would be foolish to accept their input as justification for a belief. If the world – and therefore our processes of perception, thinking, etc. – was not consistently rule-governed, reliabilism would cease to function.

Frederick Suppe provides an example of this in his article "Epistemology" in Gary Ferngren's Encyclopedia of Science and Religion in the Western Tradition. "Reliabilisms," Suppe writes, "are externalisms that locate evidential adequacy in the cognitive and sensory processes of belief formation. Knowledge thus consists in those (true) beliefs that are formed in reliable manners in response to sensory experiences" (Suppe 2005, p. 31). He considers the act of reading a gas gauge in a car. Suppe divides this into two parts: the "direct" experience of looking at the indicator light on the dashboard is facilitated by our visual system taking in waves of light and processing them in the brain. Similarly, the "indirect" experience of knowing how much gas is left in the car requires the proper functioning of the car's mechanics that produce a display based on sensors in the gas tank. Therefore, "I know the gas level G by looking at the gauge only if the regularities at work make my sensory experience E a detector for the specific gas level G" (Suppe 2005, pp. 30-31). The key in this passage is that we must be able to trust the "regularities at work." Without the proper functioning of our visual-perceptual systems, as well as the mechanisms of the car's sensors and electric currents, we would not be justified in saying that we have knowledge of the gas level by looking at the indicator light. This consistency and uniformity, without which reliabilism is unable to function, is the topic of this chapter.

That the world exhibits some level of regularity may appear trivial to the modern mind, which is trained in laws of nature and how these may be manipulated. However, this rule-governed approach to the universe around us has not always been the dominant one. I argue alongside Harrison and others that this worldview took hold during the Protestant and Scientific Revolutions. In the next section, I will present a brief timeline of sorts, illustrating how views of nature evolved through the centuries preceding our target era. This will illustrate the changes which led up to the mechanistic view of nature, and the regularity which reliabilism requires.

Again, I want to be clear that I do not mean to present this as a full story of the origination of reliabilism, induction, or the mechanistic worldview. Rather, I want to help elucidate its propagation. Inbetween the birth of a concept and its adoption are the intermediary steps where arguments must be made in its favor, and where related views of the world might be rearranged to accommodate it. It is this process that I claim to be expounding upon. It is outside the scope of this paper to point to the earliest known introduction of the concepts I will discuss; my goal is to elaborate the events that helped them gain acceptance.

CHANGING VIEWS OF NATURE

In his contribution to *The Cambridge History of Science* (Volume 3: Early Modern Science), Daniel Garber (2006, pp. 44-45) writes about the mechanistic view of nature that was emerging in the 16th and 17th centuries:

...the idea that there are general laws that govern insentient and inanimate nature, mathematically formulable regularities, that govern all bodies, was an apparently new feature of the mechanical philosophy of the seventeenth century; with the idea that there is one kind of matter in the whole of the universe came the idea that there is one set of laws that governs that matter.

Garber identifies Descartes as the first to put this idea in writing, and Galileo was one of the leaders of this new mechanistic worldview (2006, p. 45). Their views marked multiple important departures from the typical Aristotelian account of nature. For one thing, they removed the differentiation between types of matter, as well as the division between matter and any mathematical descriptions that were true of it (Umphrey 2018). Instead, they argued that nature was inherently mathematically structured (Umphrey 2018). They also did away with another important feature of Aristotle's work: teleology (Crane 2016; Umphrey 2018). Aristotle believed that nature behaves as it does because it has been designed for certain ends, or certain things that it was meant to achieve (Crane 2016). But in a mechanical system,

bodies act as they do because they are subject to certain natural laws (Crane 2016). This is not to say that they removed God's creative or sustaining work from the picture. Rather, they just changed this view a bit. Stewart Umphrey (2018, p. 158) writes that "Early Galileans...took God's intellect to be that of a mathematical engineer." This also initiated changes in methodology, as I will show in the next chapter.

By the time the late 1600s came around, mechanism was prevalent in intellectual thought all over Europe (Garber 2006). What spurred this change?

A number of authors have suggested that the Protestant Reformation played a role in the adoption of a literal and law-governed approach to nature. Because it is so difficult to imagine a world without the science and worldviews to which we are accustomed, I think it is helpful to take the time to understand how natural philosophers viewed nature before, so that we can appreciate the significance of the shift. Harrison outlines these developments in his book, *The Bible, Protestantism, and the Rise of Natural Science*. In the second and third centuries, early Christian theologians followed Plato's lead and took the visible world as a means of learning about the invisible world (Harrison 1998). (This allowed them to argue against the heretical Gnostics, who saw the physical as only a barrier to the spiritual.) Rather than attempting to understand how the physical world worked, this practice saw natural things as *signs* which pointed toward Scriptural truths. This was taken to such an extent that "the things of nature," Harrison (1998, p. 31) writes, "in their physical manifestations, were thus so burdened with spiritual meanings that they themselves tended to become completely transparent."

Work by Aquinas and Anselm began to challenge this paradigm, and their increased emphasis on physical aspects of humanity and the divine incarnation lent a greater importance to the natural world. At this point, then, a decision had to be made about how to

interpret the physical world. Harrison (1998, p. 45) argues that since Scriptural study was "the only other systematic hermeneutical enterprise in existence at the time," the methodologies used to understand the Bible were simply transferred onto nature as well. Nature provided a host of moral lessons and allegorical truths, and learning these allowed humans to practice imitating God's wisdom. However, at this point, nature was largely studied in a textual setting: personal experience was subjugated to the wisdom of ancient authors who had already studied and preserved nature for us. How arrogant to assume that we could challenge such formidable intellects! Just as the 'exegesis' of nature was patterned after that of the Bible, so also the magisterium of the ancient writers took on an authority akin to Scripture and the Church Fathers (Harrison 1998). The boundaries within which nature could be interpreted were strictly set.

However, this methodology left itself open to a number of problems (Harrison 1998). For one thing, any disagreement between texts became difficult to explain. For another, increased travel led to new discoveries that didn't always fit within existing structures. And thirdly, the interpretive approach to Scripture on which natural investigation was patterned had to face its most significant challenge yet: the Protestant Revolution.

Martin Luther, emphasizing the fallibility of *all* men, brought a huge challenge to the authority of the church. He fought to make Scripture the ultimate authority instead of church leaders, and he worked to make the Bible available to all people *without* the notes that typically accompanied it describing the church-sanctioned interpretation. This left him without an arbitrating body, however, to decide between differing readings of Scripture. The solution was to take the Bible literally (Harrison 1998). Harrison (1998, p. 4) argues that "[t]he literalist mentality of the reformers thus gave a determinate meaning to the text of scripture, and at the same time precluded the possibility of assigning meanings to natural

objects." Literalism attributed meaning only to words; not to objects. "[O]nly words refer," Harrison writes,

the things of nature do not. In this way the study of the natural world was liberated from the specifically religious concern of biblical interpretation, and the sphere of nature was opened up to new ordering principles. The mathematical and taxonomic categories imposed by Galileo and [17th century naturalist, John] Ray on physical objects and living things represent an attempt to reconfigure a natural world which had been evacuated of order and meaning (Harrison 1998, p. 4).

When the allegorical method of Scriptural interpretation was impugned, this deprived the natural world of the biblical references it had long enjoyed. Harrison believes that this opened the door for a new sort of science, which turned out to be the mechanistic one that Galileo was working on. Protestant challenges of priestly authority and miracles advanced a "demystification of the world," which "spurred the emergence of a deterministic view of the universe, a basic prerequisite for scientific investigation" (Westfall 1958 as cited in van Niekerk 2020, p. 5).

Indeed, while there were conflicts between the new emerging form of Christianity and mechanistic view of the universe,¹ there were also ways in which they fit together quite well. For example, as John Calvin carried on Luther's reforming work, he emphasized God's sovereign will. This painted a picture of a God who determined the workings of the world with just as strong a necessity as he did salvation (Harrison 1998). The world thus had a decided regularity to it, the rules of which could be found through empirical investigation (Harrison 1998). Writing in the current century, Vishal Mangalwadi (2011, p. 78, as cited in van Niekerk 2020) also retrospectively connects the mind of God with the operations of nature:

Science flourished in the fertile ground of Christendom because Christians saw that their rational God had made a universe of uniform laws on which

¹ For examples, see Margaret J. Osler's "Mechanical Philosophy" in Ferngren's Encyclopedia of Science and Religion in the Western Tradition

men with their own rational minds – again in imitation of the mind of the super-intending God – could rely.

Thus, developments in Protestantism in the 16th and 17th centuries opened the doors for the law-governed, mechanistic view of the world with which we are familiar today.

Reliabilism and the Mechanistic Worldview

It is worth pausing here to appreciate the magnitude of these changes. At stake in these changing interpretations of the Bible was not only the attribution of authority and arbitration of Scriptural meaning, but also, if Harrison is correct, the exposition of nature itself. Perhaps this was not a consequence that Luther intended when he nailed his theses to the door. But for a society in which church authority reigned supreme over many yet-undifferentiated disciplines, its dispute had far-reaching impact. Surely it would be incorrect to attribute the science that emerged in the following centuries *solely* to clashing religious forces. Yet the work of the Protestants to transform the *zeitgeist* of the day has effects which reverberated far beyond religious life.

These considerations show that the reliabilism espoused by Goldman and others assumes the existence of a rule-governed world, a view that began its ascent to popularity during the Scientific and Protestant revolutions. If the world is not so regularly structured, then not only would our present scientific enterprises be dismantled, but neither would we be able to justify our knowledge by reference to processes that have proved to be (often) correct in the past. What seems today to be a fairly common-sense notion has not always been so, and indeed required substantive revision of authority structures and hermeneutical practices in order to achieve acceptance. In this chapter, I have outlined a basic reliabilist approach to justification, using Goldman's work as an example. I have argued that reliabilism would fail without a stable and mechanistic worldview. Through the historical elucidation of Harrison and others, I have traced how views of nature changed, moving from a means toward information about the invisible world, through an allegorical phase, and on to the literalist regularity present in the work of both Protestant and Scientific reformers. In the next chapter, I will illustrate a parallel connection between these 16-17th century revolutions and a second method of epistemic justification: evidentialism.

CHAPTER 3: EVIDENTIALISM

In the previous section I have shown how early Protestantism (and emerging science) helped lay the groundwork for a mechanistic view of the world, which provides the lawguided system which reliabilism requires. The current chapter demonstrates how the Protestant Reformation also helped to ground evidentialism, another major type of justification in modern epistemology. I will argue that the growth of evidentialism required a rejection of previous authority structures, shifting the standard of measurement onto nature itself. The first authority structure which required challenging was the Catholic Church, and I will discuss Luther's work to dismantle their monopoly. Second, early scientists also needed to break free from the widespread deference to ancient predecessors, in order to allow new ideas to emerge. The final stage was to designate a new standard of reference for the emerging science. This would not be the approval of this or that philosopher, but the engagement of the human mind with the new authority: nature. These movements lent great support to the advancement of evidentialism.

EVIDENTIALISM

Evidentialism about justification means that proper support for a belief comes from the evidence that we have at that time (Steup and Neta 2020; Mittag n.d.), which could take the form of anything from sensory experiences to memory (Steup and Neta 2020). However, whatever it is must be in the possession of the knower (Mittag n.d.).² Because of this, evidentialists are often internalists also, since they derive justification from something that is available to the subject. In addition, the concept of justified belief seems to include an

² See also Conee and Feldman, p. 88 – "Thus, on our usage, evidence is always evidence someone has."

inherent requirement that we proportion our beliefs to the strength of our reasons (Mittag n.d.).

Two prominent supporters of Evidentialism, Earl Conee and Richard Feldman, discuss their views on justification in their article on "Evidence." Their insights will be helpful to the connections that I will make here. Conee and Feldman (2008, p. 84) discuss two different ways that we use the word "evidence" in our everyday language: as "scientific evidence" and "justifying evidence." "Scientific evidence" is available for anyone to observe and dependably indicates the presence of some state of affairs (Conee and Feldman 2008, p. 84). They give the example of evidence used in law enforcement, such as fingerprints on a weapon. Specifically, "E is scientific evidence for P provided that E is publicly available and E reliably indicates the truth of P" (Conee and Feldman 2008, p. 84). "Justifying evidence" is essentially "scientific evidence" plus the subject's knowledge of a connection between E and P (Conee and Feldman 2008, p. 85). If someone is aware of E but has no idea that E illustrates the presence of P, then she would not be *justified* in believing P (Conee and Feldman 2008, p. 85). "To be justified in this case," Conee and Feldman write, "[s]he must in some way grasp the connection between [E] and [P]. ... The conjunction of [E] and with information about [E's] connection to [P] is justifying evidence for [P]" (Conee and Feldman 2008, p. 85). Thus, "justifying evidence" is "scientific evidence" combined with the knowledge that E suggests P.

Conee and Feldman indicate that when they use the word "evidence," they mean to refer to "justifying evidence." This is so that the "connection between having supporting evidence and justification" is clearer (Conee and Feldman 2008, p. 86). However, because this paper refers to evidence in contexts that are not purely epistemological, I will use the term "evidence" in the "scientific" way so as not to make things more confusing. We might just remember that, at least on Conee and Feldman's proposal, an additional factor

CEU eTD Collection

(knowledge of the connection between E and P) is required in order for evidence to provide justification for belief.

In their paper, Conee and Feldman focus on experience as evidence, writing that "all ultimate evidence is experiential evidence" (2008, p. 86). They disagree with the position that only beliefs (and not experience) can be evidence because, their opponents allege, the premises in an argument have to be something that one believes (Conee and Feldman 2008, p. 87). Instead, they point out some simple examples where the experiences we have serve as evidence, such as when we are trying to discern the temperature or color of something near to us. How things seem to be to our sensory organs is the evidence we provide to show that the weather is cold or her clothes are blue (Conee and Feldman 2008, p. 87). "Experience is our point of interaction with the world," they write. "Conscious awareness is how we gain whatever evidence we have" (Conee and Feldman 2008, p. 87).

This is crucial to the connection I will make in this chapter, because of something else that Conee and Feldman write about evidence. During their discussion of "scientific evidence," they write that it

is discovered by finding connections between a state in the world and the factors or symptoms that reliably indicate its presence...*It can serve as a theoretically neutral adjudicator of disputes about the presence or absence of the state for which it is evidence* (Conee and Feldman 2008, p. 84, emphasis added).

This idea of experiential evidence as adjudicator is exactly what I will be tracing through history, because it did not always possess this role. It had to be won. As intuitive as it seems today that experience/evidence would serve as the arbiter between differing accounts of a phenomenon, there are other entities that take their claim to this position very seriously. Both the Catholic Church and ancient philosophers were seen as having authority over natural knowledge. One person taking their experience as evidence was hardly powerful enough to oppose such magisterial assemblies. It took hard work on the part of 16th and 17th century reformers to break the supremacy of the Church and the older natural philosophers. In such a state, the best support for a theory comes from the decrees of these groups. However, Luther, Galileo, Bacon, and others wanted to make room for the importance of individual evidence as well: evidence that comes, as Conee and Feldman wrote, from our engagement with the world, not just from a designated establishment.

Evidentialism was definitely not a new strategy in the 16th century. However, the Protestant Reformation and Scientific Revolution initiated a key change that would help make evidentialist practices much more common. By questioning the existing clerical power of the church, Luther and the Reformers set the stage for a substantial authority shift. Luther began this by opposing the dominion of church leaders, and the natural philosophers I present in this chapter continued it by transferring scientific authority to nature instead of ancient writers. Without this, insights gleaned from personal interaction with the world would not have the force that they do today. In order for evidentialism to take hold, we need (a) a society in which individual experience is considered a genuine means of acquiring knowledge, and (b) a view of nature in which the world is available for study, rather than unveiled only to a select few.

In the following paragraphs (after a brief interruption) I will elaborate on four steps, or movements, that helped bring about a society that was more conducive to evidentialism. First, someone needed to take an initial step toward breaking the church's control. Luther was this someone, and even if he wasn't advocating for evidentialism specifically, he was beginning to dismantle a major obstacle to it. He also advocated for a more literalist reading of the Bible, which provided additional support to the goals of the emerging science. His questioning of Catholic authority on matters of religion was step one in the set of co-

CEU eTD Collection

developing revolutions. Step two³ was to challenge the Church's regulation over investigations of the natural world. Galileo was one of the proponents of bringing what would become 'science' out from under the dominion of Church leaders. Step three involves the rejection of the ultimate authority of ancient leaders in natural philosophy. I will show how Bacon and Sprat argued for the ability of man to construct new knowledge based on their engagement with the world, rather than limiting themselves to already-existing content. Finally, the fourth step requires the appointment of a new authority. If not the Church, and if not Aristotle, then whom? As it turns out, the answer is not a "whom" but a "what:" nature itself. Nature would be the new arbiter of science in place of the Church or the ancient philosophical canon. All of these steps taken together cleared the way for the rise of evidentialism.

A Brief Interlude

Before I go on, I would like to address the potential concern that I have been conflating epistemology with philosophy of science. I claim to be tracing parts of epistemology's history, but I'm presenting work done in religion and natural philosophy.

As I have mentioned, I do not claim to be providing the whole story about either reliabilism or evidentialism. Certainly the 16-17th centuries were not the first time that they were in use. Additionally, directly equating the rise of evidentialism in epistemology with its growth in early science will lead to various discontinuities. For example, when I speak of church authority, the common 15th century citizen didn't have to rely on the Pope to tell them whether it was raining outside. The use of evidence in how we know everyday propositions is

³ As long as Luther is step one, the rest of the steps are not necessarily in a chronological order, but more of a logical one.

not necessarily something that changed during the time period I am presenting. However, I do think that the rise of evidentialism in science made it possible for us to take the same view toward epistemology later. People have been relying on evidence for a long time, but we did not widely consider it that way until it gained traction in other areas also. I am arguing that as evidentialism rose in importance in the collective public consciousness, it became more natural for us to take it as an epistemological theory as well.

Additionally, the inspiring force behind this thesis is to try to understand epistemology not simply through a religious or scientific lens, but rather to consider all of these as a part of the changing project of human knowing. The assumptions that modern science rests upon have affects that reach *much* further than the laboratory. And the outcomes that we will accept from the laboratory are also partially a function of the society in which they are produced. What it takes to acquire knowledge in a given time period may entail presuppositions that come from a field other than epistemology. This is not an error; it is simply human. We may have siloed our academic disciplines, but the same is hardly ever true about our lives and thoughts. And, as I have been hinting throughout these pages, divisions between areas of study have not always been so strong as they are today. "Science" and "religion" weren't engaged in some ongoing, abstract war. Galileo had to fight to give them some breathing room from each other.

It has also been my thesis throughout this paper that the revolutions we see in these fields (as we now have separated them) quite likely interacted with each other or supported each other in certain ways. As Popkin (2003, p. 15) writes:

The Reformers' challenge of the accepted criteria of religious knowledge raised a most fundamental question: how does one justify the basis of one's knowledge? This problem was to unleash a sceptical crisis not only in theology but also, shortly thereafter, in the sciences and in all other areas of human knowledge. This paper concentrates on a more thorough understanding of two types of epistemic justification: reliabilism and evidentialism. We see these employed in areas outside of strictly epistemology, just as they are affected by "extra-epistemological" factors. The aim is to take epistemic concepts and try to understand them holistically, in the context of this reformation or that shift in societal thinking. My goal is to "problematize" these concepts in a way that helps us to understand where they came from, and the role they may play in our lives.

MOVEMENT 1: LUTHER CHALLENGES THE CHURCH

I have already begun to explore the changing methods of interpreting both the Bible and the world that Protestant Reformers and Scientific revolutionaries worked to bring about. Underneath all of this lies two regulatory bodies that our modern science is (for the most part) not subject to today. These two arbiters were the church, and venerated ancient authors. Martin Luther's arguments that common people, with the aid of the holy spirit, could make decisions about truth *without* the intervention of the church flipped the typical method of operation on its head (Popkin 2003 p. 4, citing Luther's *The Appeal to the German Nobility*). While before this the Bible had derived its authority from the church, Luther now argued that the Bible was primary, and that the church's power was grounded in it (Harrison 1998). As mentioned in the previous chapter, he had the Bible printed in a language that was accessible to the common people, and removed from it the accompanying notes indicating the churchapproved interpretation. Luther claimed that the honored church leaders were just as fallible as every other human, and thus didn't deserve the preferential treatment afforded to their teachings (Popkin 2003, p. 4, citing Eck's account of the Leipzig Disputation of 1519).

This departure obviously changed the course of church history dramatically. But the key feature for our purposes here is that Luther opposed one of the strongest authority

structures of the age. Harrison and others have argued that this was one of the largest ways in which the Protestant Reformation supported the Scientific Revolution. Harrison (1998, p. 101) writes,

[i]n freeing persons to make determinations about the meaning of the book of Scripture without deferring to authorities, the reformers had at the same time made room for individuals to make determinations about the book of nature, unfettered by the opinions of approved authors.

Standing up against the church's power monopoly was the first step toward forward movement in a variety of fields (still largely undifferentiated from each other at this time.) Harrison (1998, p. 113) goes on to cite Kepler's assertion that "the chief impediment to improvement in natural philosophy lay not with the text of Scripture, but with the decrees of the Holy Office and the opinions of the Doctors of the church."

MOVEMENT 2: GALILEO CHALLENGES THE CHURCH

Now that there was at least one viable challenge against the domination of the Church over all religious and intellectual life, the next step was to confront the Church specifically on matters pertaining to (what would become) science. Galileo felt that a sort of division of power was in order. He thought that the Church and the Bible should retain authority over anything having to do with salvation. However, when it came to investigations and explanations of nature, he believed that the arguments should be taken on their own merits, and not ruled out because someone had enlisted Biblical passages against them.

Galileo gave a couple of arguments for this separation of authority. He thought that the Bible had been written in a way that was intelligible even to the uneducated, and therefore it used language which should not be not be taken literally (Galilei 1615, p. 4). Nature, he argued, has no such limitation. In his letter to the Grand Duchess Christina, he writes: Nature, on the other hand, is inexorable and immutable; she never transgresses the laws imposed upon her...For that reason it appears that nothing physical which sense-experience sets before our eyes, or which necessary demonstrations prove to us, ought to be called in question (much less condemned) upon the testimony of biblical passages which may have some different meaning beneath their words (Galilei 1615, p. 4).

Not only is nature reliable because of the regularities set in place by God, but so also may we trust our sensory perception of such, because it directly tells us of the divinely created world. Therefore, our observations and our proofs should be the arbiters of natural truth, instead of the Bible:

...in discussions of physical problems we ought to begin not from the authority of scriptural passages but from senseexperiences and necessary demonstrations; for the holy Bible and the phenomena of nature proceed alike from the divine Word the former as the dictate of the Holy Ghost and the latter as the observant executrix of God's commands (Galilei 1615, p. 4).

Galileo's argument against Biblical control over natural investigation was not because he didn't believe in God, nor was it a spiteful way of pitting science against religion. No, in this passage he argues that both the Bible *and* nature are manifestations of the Word of God. They merely require different hermeneutical strategies: as discussed in the previous chapter, we can trust that God has set certain regularities into nature. Here Galileo argues that we can identify these through sense experience and experimentation.

Part of his reasoning for dismantling the authority of the Bible over natural science was because he felt that its weight was being used dishonestly in intellectual arguments. At this time, he was in the unfortunate position of arguing in favor of the Copernican system, which he believed he had proved, in an environment where the Ptolemaic order of the heavens was taken to be true for Biblical reasons. However, Galileo felt that his opponents had been dishonest. Once they could no longer provide natural/philosophical arguments against his work, he claims that:

these men have resolved to fabricate a shield for their fallacies out of the mantle of pretended religion and the authority of the Bible. These they apply

with little judgment to the refutation of arguments that they do not understand and have not even listened to (Galilei 1615, p. 2).

Those arguing against Galileo had fallen back on religious authority when their philosophical acumen ran out, he writes. And indeed, they argue with fervor despite the fact that they could simply be misinterpreting the Bible (Galilei 1615, p. 3). In addition to the hubris of such a position, on Galileo's view of God and the Scriptures, it simply doesn't make sense. As mentioned above, Galileo saw the role of the Holy Spirit, through the Bible, as focusing on things that had to do with our faith and salvation. Therefore, if there are facts about the natural world that the Holy Spirit did not specifically teach us, then how can there be a "Biblically right" answer and a "Biblically wrong" one? On this argument, there would be no salvific difference between two different propositions about nature. Thus, Galileo's opponents were applying Scriptural authority where (he argued) it didn't claim any.

This was not to say that the Bible and discoveries about nature need not align with each other at all. Galileo believed that ultimately, truth could be found in both Scriptural and natural realms, and that when accurately interpreted, Biblical truths "will unquestionably accord with the physical conclusions which manifest sense and necessary demonstrations have previously made certain to us" (Galilei 1615, p. 6). It would be foolish to think that we had eradicated all errors from either natural or Scriptural study, and so we should not "permit anyone to usurp scriptural texts and force them in some way to maintain any physical conclusion to be true, when at some future time the senses and demonstrative or necessary reasons may show the contrary" (Galilei 1615, p. 6).

The work of Galileo to let natural investigation rely on observation and experimentation without the management of the church contributed in two major ways toward clearing a path for evidentialism. The first one follows a similar logic as that in the previous section on Luther: as Christopher Hill (1964, pp. 71-71) argues, "what mattered for

the development of science was not so much protestant doctrine as the breaking of clerical monopoly control..." The issue here is in who or what serves as the arbiter of truth. If the church, then evidentialism's reference to individual experience with the world will not hold much power against clerical decrees. Therefore, in order for evidentialism to have any weight, the first (and in our case, the second as well) step is to interrupt the Church's overarching control. Luther and Galileo both strove toward this, even if they did so with very different goals in mind. Both of them needed to move authority away from the church, and in this way they were able to help each other.

Second, Galileo was also moving toward what will come as our fourth step later: the relocation of authority in nature. Once the church has been partially deposed, then what will take its place? Here I have shown Galileo's claim that nature is another one of God's works, and that it can serve as its own arbiter. Natural philosophers can rely on their observations and demonstrations of the natural world because God has made it to be so interpreted. They needn't prove that they have the approval of the Bible (since that isn't what the Bible is written for, according to Galileo). Rather, if they can prove that their work aligns with *what we see in nature*, then they have passed. I will return to this in step four below.

MOVEMENT 3: CHALLENGES TO THE PHILOSOPHICAL CANON

After putting a dent in the church's authority, there was another layer of opposition that early scientists would have to push against. The next confrontation came from those philosophers who wanted to preserve the views of Aristotle and other ancient authors (see Brooke 1991), often to the detriment of the development of modern science. In the past, certain writers in natural philosophy were taken to be the authority on what existed in the world. To contradict their writings merely because you yourself had never seen whatever fantastical animals they wrote about was a great disrespect. Harrison (1998, p. 69) tells us that

the secular writers of antiquity came to share the privileged status accorded to Scripture and the Fathers. As the hapless Galileo was to discover, these combined authorities were to delimit the range of legitimate ways of reading the book of God's works, and together could present a formidable obstacle to novel interpretations of nature.

Francis Bacon fought against this issue as well. Silvia Manzo (2006) writes about Bacon's disdain for educational institutions which lacked original thought, instead teaching students to become followers of previous writers. He accused them of "[adoring] the deceiving and deformed images which the unequal mirror of their own minds, or a few received authors or principles did represent unto them" (Manzo 2006, p. 259, citing Bacon's *The Advancement of Learning*). Instead, he argued for a methodology not too far from that of the Protestants, claiming that "[true authority] lies in the understanding and the senses of every self-controlled individual" (Manzo 2006, p. 263).

Thomas Sprat's 1667 (p. 47) history of the Royal Society of London describes similar struggles, and a similarly Protestant conclusion:

They charge us with immodesty in neglecting the guidance of wiser, and more discerning Men, then ourselves. But is not this rather the greatest sign of Modesty, to confess, that we ourselves may err, and all mankind besides? To acknowledge the difficulties of Science? And to submit our minds, to all the least Works of Nature?

These new movements in science brought offense, their opponents claimed, to the great minds of ancient times. Yet notice that Sprat makes a move similar to Luther's: he points out the imperfections present in even the most esteemed thinkers, and in so doing invites anyone to engage in the labors of science and "submit" themselves to the understanding of Nature (Luther, in parallel, required submission to the Holy Spirit). Sprat goes on to suggest that those arguing for the supremacy of ancient work might actually be doing so under false pretenses. They act like they are promoting the great philosophers, he said, when they are actually more enamored with their own commentaries and expansion on the ancient works – and this to such an extent that they have wandered far away from the original texts (Sprat 1667, pp. 48-49). Instead, Sprat recommends that we take up the same methods that the ancients did, which included creation and invention. By critically examining the work of those great minds which came before us, we can better honor them than if we were to approach them with only a "rash affection" (Sprat 1667, pp. 49-51).

MOVEMENT 4: MAKING NATURE THE NEW AUTHORITY

The final step on our path serves to fill a void that the first three steps created. If the revolutionaries under scrutiny were so called at least in part due to their rejection of accepted authority structures, then what was their recommendation? Where did they want the power to rest instead?

At first glance, it may appear as though there has been a shift in authority away from an esteemed group – such as the Church or the ancient canon – and toward the individual instead. This was the case to an extent: Luther did fight for the ability of the individual to interpret Scripture and make judgments (with the help of the Holy Spirit). Galileo and Bacon did argue that educated men should be able to produce knowledge about the world, even if their hypotheses didn't happen to match the Church's or the ancients' views, respectively. However, I think that there is something else going on. After all, Luther didn't advocate for a form of relativism, in which each individual was authoritative regarding his or her own version of right and wrong. Nor did Galileo make the individual investigator the center of attention, because he or she must still rely upon observations and experiments. Actually, Galileo gives us a prime example of how choosing *not* to focus on the individual can actually increase the authority of their proposal. (I will return to that later.) Rather, I believe we see

nature taking on more authority in scientific endeavors. And while this may provide more power to the individual because nature is accessible, their work must accord with what we *see* in nature. To show this, I would like to pick out a couple of points that I have already covered.

One place where I have shown nature gaining authority is in Sprat's work, where he was responding to those accusing him of disrespecting the ancient philosophers. There he points out that it is actually more humble to admit that anyone – including ourselves, and the ancients – can be wrong about something (Sprat 1667, pp. 47-48). We do our best work when we follow the creative *methodologies* of the ancients (Sprat 1667, pp. 49-51), and "submit our minds, to all the least Works of Nature" (pp. 47-48). When speaking of the implausibility of believing the ancient authors on everything, Sprat (pp. 47-48) writes:

That we should subscribe to their sense, before our own? We are willing, in probabilities; but we cannot, in matters of Fact: for in them we follow the most antient Author of all others, even Nature itself.

Fully following the testimony of early authors about nature didn't sit well with Sprat. He saw that there were certain facts to which nature testified that perhaps ancient philosophers did not, or did so incorrectly. And he felt driven to place the authority of nature over that of the men writing before his time.

This is important for evidentialism because, as we saw from Conee and Feldman at the beginning of this chapter, evidence comes from our observations and interactions with the world around us. This is exactly what Galileo and Sprat were trying to emphasize. If authority lies in certain people, then their words or their approval are what will confirm or deny a theory. But if nature is the standard, then our sensory experiences with the world will serve as support for our arguments and beliefs. This was an important departure from the Aristotelian tradition. Umphrey (2018, p. 168) writes, The requirement that mathematical physics be empirical distinguishes Galilean science from the rational mechanics of the fourteenth century, and the requirement that empirical investigations be rule-bound distinguishes it from Aristotelian physics altogether.

The movement away from a tradition-driven system and toward an empirical one built on experimentation makes a natural path for evidentialism.

Another place we have seen nature's rise in authority is in Galileo's argument for the separation of Biblical and (what would become) scientific powers. I gave a number of his reasons for why nature should be taken as an authority separate from Scripture, including nature's "inexorable and immutable" characteristics, and its role as the "observant executrix of God's commands" (Galilei 1615, p. 4). He urges us to approach nature not through the Bible, "but from senseexperiences and necessary demonstrations" (Galilei 1615, p. 4). And while these are activities that people/individuals carry out, note that they ultimately derive authority from nature and not from man: man *observes* and *demonstrates*, but it seems implied that these demonstrations must accord with nature itself.

Here Galileo points toward nature as a standard of justification grounded in God's commands and accessed through our senses. But his work shows us something else as well: how focusing on nature's authority can lend more credibility to a proposal.

Bono, in his book on *The Word of God and the Languages of Man*, describes how Galileo presented, or framed, his work. Instead of proposing a "Galilean philosophy" (as it would still have been called at the time) to compete with all of the other philosophical authorities, he chose a different route. We should not settle for a philosophy that has been invented by humans, he claims. Humans make things up and humans make mistakes, but surely the same is not true of the Creator himself. Therefore, focusing on the world God created helps us avoid error. Because Galileo believes that we can obtain truth about nature through our sensory interactions with it, he argues that "Philosophy is written in this grand

book, the universe, which stands continually open to our gaze" (Galileo's *The Assayer* as cited in Bono 1995, p. 194).

This was, of course, only another methodology among many, but by describing the analysis of nature in such a way, Galileo removes himself from the picture (Bono 1995). He separates himself from his opponents by claiming that his proposal isn't like the others: his way is the only one which follows nature instead of man. This allows him, Bono (1995, p. 195) writes, to

claim a kind of authority for the 'philosophy' he espouses that transcends human institutions and the limitations of human fabrication...Instead, he transfers authorship to a nonhuman agency: to nature itself and, by implication, to the author of nature Himself, God.

The best way to advocate for his new methodology was to make himself as transparent as possible. Men are the source of error, not of knowledge. On this picture, the human investigator, having learned the now-famed "language of mathematics" directly (Galileo's *The Assayer* as cited in Bono 1995, p. 194), can almost invisibly and impeccably encounter nature. Galileo's method of veiling the human knower in favor of nature adds authority to his proposal.

CONNECTING TO EVIDENTIALISM

The important shift to notice here occurs in both the Protestant and Scientific revolutions. In these two movements, we see a marked change away from reliance on established authoritative authors. John Hedley Brooke (1991, p. 111), citing Sprat's insight, writes that "[e]ach [reformation] prized the original copies of God's two books, nature and the Bible, bypassing the corrupting influence of scholars and priests." There was a pattern of return to the primary sources (nature and the Bible) without a need for someone to interpret it for you.

I can now draw all four steps together. Evidentialism invites the subject to observe the world around and inside of them, and construct their beliefs from these findings. This is a very different process from submission to ecclesiastical – or philosophical – authority. This latter methodology is exactly what Luther, Bacon, Sprat, and Galileo were arguing against. Even if evidentialism was not new to this time period, they had to fight to make it commonplace in knowledge production. There were multiple parts to this process, including confronting the church, separating ecclesiastical and scientific authority, challenging revered philosophers, and advocating increased authority for nature.

Evidentialism takes as its standard of reference not a person, but nature itself. This is one of the crucial mindset shifts that I believe was occurring at this time. Instead of science existing in pages produced by the ancient greats, or selected by the church to match their doctrines, the ultimate scientific authority now lay in the external world. Galileo wrote that we must only learn to speak the language of math, and then we can study the natural world directly. He invites his contemporaries to set aside adherence to this philosopher or that, and instead to come learn directly from nature. The benchmark against which science would be judged would no longer be the decrees of certain establishments, but rather nature itself.

CEU eTD Collection

This is not to say, of course, that humans had no authority in the production and regulation of science; this is quite clearly false. The change going on here means that the *ultimate* authority is now external to man. Aristotle is no longer the final authority, nor the Church: it is nature. And if the natural world has the final say in science, then how can one show that they have the endorsement of this master? Adherence with human experts is now

only part of the picture; one must also produce *evidence* to the effect that nature itself has approved of your work.

Therefore, we have now met the two conditions that I mentioned earlier in the chapter that are required for the ultimate success of evidentialism: (a) a society in which individual experience is considered a genuine means of acquiring knowledge, and (b) a view of nature in which the world is available for study, rather than unveiled to only a select few. This opens the door for the evidentialism expressed by Conee and Feldman, in which our interaction with the world allows us to find points of connection between a state of affairs and the indicators we call evidence. Our engagement with nature needed to be given this authority; it has not always possessed it. Where before, the Church or parts of the philosophical canon would have served as judge between varying accounts of nature, the individual's exploration of it can now act as "a theoretically neutral adjudicator" (Conee and Feldman 2008, p. 84, quoted above).

This chapter has shown in part the historical conditions which provided significant support to evidentialism. Changes in the standard of knowledge which took place in the 16-17th centuries help us to better understand the theories of justification that we utilize today. The present example shows that underneath evidentialist practices lies a commitment not to external authorities but to an engagement with one's own experience. Today, it can seem simply foolish to prioritize anything above our collected evidence, but a look back in history reminds us that such was not always the case. The men in this section worked hard to make knowledge obtainable by anyone who could provide proper evidence from their experience, and this is what we see underlying contemporary epistemological evidentialism as well.

CONCLUSION

Throughout this thesis I have traced just a small portion of the history which undergirds our contemporary approaches to epistemology. Even though the historical events presented were within the realms of what we would today designate as religion and science, not only do they serve as indicators of the changes in mindset which were occurring at the time, but they also remind us that movement in one area of thought can have significant impacts on other fields. I have demonstrated this in the cases of two common theories of epistemic justification: reliabilism and evidentialism. These two views are generally used to satisfy the justification condition by which a true belief turns into knowledge.

Beginning with reliabilism, I showed that in order to truly indicate that this or that process of obtaining beliefs is trustworthy, reliabilism must assume that the world operates in a consistent and predictable fashion. This is a major feature of the mechanistic worldview for which the early members of the Scientific Revolution advocated. With the help of Harrison's work, I traced some of the changing views of nature which led up to this one, noting its departures from its predecessors. This demonstrates that the law-governed view of the world which supports reliabilism was in part a product of the 16th-17th centuries.

On the evidentialist front, I explored four of the historical steps that I see as bolstering the evidentialist position. Perhaps a bit surprisingly, the first of these was Luther's challenge to the authority of the Catholic church. Harrison and others have argued that this helped open the door for the early scientists who would also need to defy the church's control over conclusions about the natural world. Through the work of Bacon and Sprat, we saw that a strict reliance to the ancient natural philosophers also needed to be broken, in order to make way for nature itself to become the standard of reference. Once this took place, then the way

to support a theory or proposition was to provide *evidence* based on your experiences and experimentation.

I have not argued that the Protestant Reformation and Scientific Revolution were the sole forces behind the emergence of reliabilism and evidentialism in epistemology; this is simply false. Neither have I argued that they were absolutely necessary – that without the likes of Luther and Galileo they never would have come about. I do not think one could show that there is no other possible world in which reliabilist and evidentialist theories of justification occurred. Rather, I have argued that the changes in thought which occurred during the 16th and 17th century revolutions did support the doctrines of reliabilism and evidentialism, playing a partially explanatory role in their development. In short, we can trace parts of these theories back to ideas that were at the forefront of the Protestant and Scientific Revolutions.

There are a variety of avenues which offer stimulating opportunities for further study on this topic. For example, I have not explored the existence of reliabilism or evidentialism prior to the early modern period, and a study of their development both before and after the 16th-17th centuries would add to the picture significantly. In addition, I have not considered the difference that *location* makes in this story. The reformations considered here did not occur equally across Europe, and delving deeper into these geographical differences would point out enlightening details which I have not researched.

The value of this sort of study is in its ability to remind us where our current ideas came from, and to reveal the foundations on which they depend. It is too easy to leave these assumptions unexamined, since contemporary society takes them for granted. For example, there are not many people today who stop to question whether the world operates by certain natural laws, or whether evidence is the best way to prove a point. However, it was not so

long ago that these propositions required substantial argument, and received significant criticism. Bringing this to light allows us to examine, to "problematize" the infrastructure of a theory, subjecting it to an analysis which increases our knowledge of it. It reminds us that we are only a couple hundred years off from a totally different intellectual climate. And finally, this type of intellectual history also illuminates why we make the judgements we do about where knowledge begins and ends, which is one reason we discuss justification in the first place. Our history shapes how we decide what is knowledge and what is not, and that is worth knowing.

REFERENCES

- Becker, K. (n.d.). Reliabilism. In: J. Fieser and B. Dowden, eds., *Internet of Encyclopedia of Philosophy*. [online] Available at: https://iep.utm.edu/reliabil/.
- Bono, J.J. (1995). *The Word of God and the Languages of Man*. The University of Wisconsin Press.
- Brooke, J.H. (1991). *Science and Religion: some historical perspectives*. Cambridge: Cambridge University Press.
- Conee, E. and Feldman, R. (2008). Evidence. In: *Epistemology: New Essays*. Oxford University Press, pp.83–104.
- Craig, E. (2007) "Genealogies and the State of Nature," in Thomas, A. (ed.) Bernard Williams. Cambridge: Cambridge University Press (Contemporary Philosophy in Focus), pp. 181–200.
- Crane, T. (2016). *The Mechanical Mind: a philosophical introduction to minds, machines and mental representation.* 3rd ed. New York: Routledge.
- Garber, D. (2006) "Physics and Foundations," in Park, K. and Daston, L. (eds) *The Cambridge History of Science*. Cambridge: Cambridge University Press (The Cambridge History of Science), pp. 19–69.
- Goldman, A. (2012). What Is Justified Belief? In: *Reliabilism and Contemporary Epistemology: Essays.* Oxford University Press.
- Goldman, A. and Beddor, B. (2021). Reliabilist Epistemology. In: E.N. Zalta, ed., *The Stanford Encyclopedia of Philosophy*. [online] Available at: https://plato.stanford.edu/entries/reliabilism/#Bib.
- Harrison, P. (1998). *The Bible, Protestantism, and the rise of natural science*. Cambridge: Cambridge Univ. Press.
- Harrison, P. (2006). 'Science' and 'Religion': Constructing the Boundaries. *The Journal of Religion*, 86(1), pp.81–106. doi:10.1086/497085.
- Hill, C. (1964). William Harvey and the Idea of Monarchy. *Past and Present*, 27(1), pp.54–72.
- Ichikawa, J.J. and Steup, M. (2018). *The Analysis of Knowledge*. Summer 2018 ed. [online] Stanford Encyclopedia of Philosophy. Available at: https://plato.stanford.edu/entries/knowledge-analysis/#JustCond [Accessed 3 Feb. 2021].
- Koopman, C. (2009). Two uses of genealogy: Michel Foucault and Bernard Williams. In: C.G. Prado, ed., *Foucault's Legacy*. Continuum, pp.90–108.
- Manzo, S. (2006). Francis Bacon: Freedom, authority and science. *British Journal for the History of Philosophy*, 14(2), pp.245–273.

- Mittag, D.M. (n.d.). Evidentialism. In: J. Fieser and B. Dowden, eds., *Internet Encyclopedia* of *Philosophy*. [online] Available at: https://iep.utm.edu/evidenti/.
- Popkin, R.H. (2003). *The History of Scepticism: from Savonarola to Bayle*. New York: Oxford University Press.
- Poston, T. (n.d.). Internalism and Externalism in Epistemology. In: J. Fieser and B. Dowden, eds., *Internet Encyclopedia of Philosophy*. [online] Available at: https://iep.utm.edu/int-ext/.
- Riggs, W.D. (2002). Reliability and the Value of Knowledge. *Philosophy and Phenomenological Research*, 64(1), pp.79–96.
- Sprat, T. (1667). *The History of the Royal Society of London for the Improving of Natural Knowledge*. Online reproduction copyright 2019 ProQuest LLC.
- Steup, M. and Neta, R. (2020). Epistemology. In: E.N. Zalta, ed., *Stanford Encyclopedia of Philosophy*. [online] Available at: https://plato.stanford.edu/entries/epistemology/.
- Suppe, F. (2005). Epistemology. In: *The History of Science and Religion in the Western Tradition: An Encyclopedia*. Taylor & Francis e-Library, pp.27–34.
- Umphrey, S. (2018). *The Aristotelian Tradition of Natural Kinds & Its Demise*. Washington, D.C.: Catholic University Of America Press.
- van Niekerk, F. (2020). Reformation and scientific revolution: Historical coincidence or continual renewal? *In die Skriflig*, 54(2).