An Exploration on the *Topoi*: How our Conceptual Frameworks Create our World.

by

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Abstract

These extended essays introduce the *topoi,* a conceptual framework that structures, mediates, and organizes our experience of the world. To develop my argument I describe the *topoisitic* perspective, a way of *seeing* the social and cultural world according to the affordances and limitations of specific frames of reference. I also explain how *topoi* change over time as new perspectives and points of view come to be accepted. The argument is illustrated with texts and ideas ranging from Darwinian evolution, to Achilles and *The Iliad,* Thomas Kuhn's *paradigm shifts*, Karin Knorr-Cetina's *epistemic cultures,* Anthony Wallace's *revitalization movements,* and N.R. Hanson's work on the conceptual foundations of science.

Keywords: Darwin; Achilles; Perspectivism; *Topoi;* Paradigm Shift; Kuhn.

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Preface

In memory of Ignaz Semmelweis and others like him.

The problem, as it appears to me, is that we are using the wrong language. The language we use to speak of the world and its creatures, including ourselves, has gained a certain analytical power (along with a lot of expertish pomp) but has lost much of its power to designate what is being analyzed or to convey any respect or care or affection or devotion toward it. As a result we have a lot of genuinely concerned people calling upon us to "save" a world which their language simultaneously reduces to an assemblage of perfectly featureless and dispirited "ecosystems," "organisms," "environments," "mechanisms," and the like. It is impossible to prefigure the salvation of the world in the same language by which the world has been dismembered and defaced.

Wendell Berry, *Life is a Miracle*

The story of how I came to write this Project is in many ways conventional. Conventional first in that it was through prolonged experience with cultures much different than my own that I came to the views expressed here. Conventional second in that it was in these places that I had the experiences that in many ways made me look at myself and my own culture with a much more critical eye than the one I was meant to be using to examine 'their' culture.

When I was twenty-seven I went on a research trip to Borneo to study socio-ecological systems in a remote Indigenous village. The trip was life-altering, as my experiences there resulted in my viewing the world from a markedly different perspective. After initially spending six weeks in the village I returned on two more occasions to conduct research based on German sociologist Ferdinand Tönnies *Community and Civil Society* (1887) and Hungarian political economist Karl Polanyi's *The Great Transformation* (1944). Wishing to better understand the processes I was witnessing in Borneo, I went to a similar village in the Peruvian Amazon to develop a comparative analysis of how two remote Indigenous villages in different tropical rainforests were encountering and dealing with Westernized globalization.

Tönnies and Polanyi being my main guides throughout my research, the principal ideas I took from each of them were roughly as follows:

From Tönnies the notion that understanding of a place comes through an holistic approach including inquiries into the following:

1. Individual and Group Psychology
2. Social and Economic relationships
3. Art, Religion, and Culture
4. Structure and operation of Politics and Law.[1]

This framework deepened my understanding as briefly concentrating on each category allowed me to recognize both the interconnected and interdependent nature of

[1] Jose Harris, introduction to *Community and Civil Society,* by Ferdinand Tönnies (Cambridge: Cambridge University Press, 2001), xv.

human societies, while also sharpening my understanding of the incommensurable spheres that constitute a social system. Tönnies' framework allowed me to examine some of the main perspectives, disciplines and structures within a society, without restricting my thought to a single discipline. Consequently, it was through this framework that I began to appreciate how an understanding of a place comes not from a single line of inquiry or a single methodology, but from an awareness of the different dimensions of experience and the different perspectives that occur in a place.

Polanyi's work forced me to ask whether or not I was witnessing similar processes to those that had occurred in England during the Industrial Revolution. That is, whether the displacement of traditional modes of social, economic, and political organization by the capitalist, legalistic system as outlined by Polanyi was also occurring in Indonesia and Peru in the twenty-first century. Passages such as the following from *The Great Transformation* were particularly important:

> To separate labour from other activities of life and to subject it to the laws of the market was to annihilate all organic forms of existence and to replace them by a different type of organization, an atomistic and individualistic one.
>
> Such a scheme of destruction was best served by the application of the principle of freedom of contract**.** In practice this meant that the non-contractual organizations of kinship, neighbourhood, profession, and creed were to be liquidated since they claimed the allegiance of the individual and thus restrained his freedom. To represent this principle as one of non-interference, as economic liberals were wont to do, was merely the expression of an ingrained prejudice in favour of a definite kind of interference, namely, such as would destroy non-contractual relations between individuals and prevent their spontaneous reformation.[2]

Polanyi thus showed me the vital interconnections between these distinct spheres and the tremendous impact a change in one can have on the others. As suggested by the above, the economic greatly impacts the social, which simultaneously impacts the political, which impacts the religious, which in turn impacts the psychological, and thus major changes in one domain can set in motion a cacophony of

[2] Karl Polanyi, *The Great Transformation* (Boston: Beacon Press, 2008), 171.

non-linear, cyclical feedbacks in the others. The result of which can be catastrophic for traditional modes of social organization.

Tönnies guided me to understand and appreciate the separate spheres within a human socio-ecological system, each with its own methods, ideas, and classes of phenomena. Polanyi taught me about the homogenizing nature of Western systems in the world today, about the non-linear relationships within and across the distinct spheres, and how when any one becomes dominant, the others can suffer greatly. My realization of the systemic and highly interconnected nature of human societies and their diverse realms then allowed me to understand how unsuited were dominant modes of rationalized Western thought both for structuring and for understanding human societies.

What I witnessed in East Kalimantan was mining companies, transmigrants from other parts of Indonesia (brought there in a government supported program), and private property regimes encroaching upon traditional Indigenous lands, bringing forth an inevitable clash between the contractual law and capitalist policies supported by the Indonesian government and the traditional land ownership patterns of the tribe I was living with.[3] As the contractual, private ownership regime gradually became hegemonic and outside corporate interests moved in, a capitalist economic system emerged to replace what was formerly a traditional, Indigenous socio-ecological system.

An inevitable result of this was the rising cost of land, and with their new legal deeds, (issued by Indonesian government officials, not the *kepela adat,* or traditional tribal chief) it became more tempting for tribe members to either sell their land outright or use it for alternative sources of income.[4] Whereas in the past the land was used solely for growing rice and other staples, I witnessed tribe members selling their land to mining

[3] Due to space limitations I discuss only East Kalimantan here, leaving Peru out of the discussion.

[4] The family that I was living with leased a large portion of their land to a private company for use as a rock quarry. As demand for cement for roads and houses increased in the area with the increased deforestation and increasing population, this family benefited greatly in terms of increased monetary wealth. They used this wealth to buy a gas-powered rice thresher and during harvest season the roar of the engine was continually heard from the back yard as members of the community would come and pay to have their rice threshed. It was no secret that this family was one of the wealthiest in the village and had much greater wealth than many others in the village. The emergence of economic inequality hand-in-glove with private property and wage-labour regimes.

companies, one entire village actually did this, selling all of their land to a mining company, planting palm trees for palm oil production, or otherwise changing their land-use patterns once they had the legal deeds and capitalist motivation to do so.

According to Polanyi's analysis, such a shift would prove catastrophic for the traditional social and economic systems, and in East Kalimantan this process appeared to be occurring again. In addition to the above, many villagers took jobs with the mining, timber, and palm oil companies and moved on from their traditional agricultural lives, thus inserting themselves directly into the capitalist system as wage labourers. This shift to wage-labour, accompanied by the changing land-use patterns, in turn made the villagers much more dependent on the market mechanism for food staples, and also vulnerable to the caprice of the international commodity markets.

Some villagers sold land, some planted cash crops such as palm, and some became labourers for the large corporations surrounding the villages; some did all three. The last time I visited I estimate that eighty percent of the population was incorporated in the new economic system. And, as always, in times of plenty this is not a serious concern. But mines do not last forever, harvestable trees are eventually cut down, and palm oil plantations succumb to ecological constraints. And this is when real difficulties begin to emerge. For while the ecological damages associated with mining, palm oil plantations and forestry differ in extent and intensity, all bring significant social changes to the lives of the Indigenous inhabitants. The drastic change in the topography of the place naturally impacting how the inhabitants live and interact with the land on a daily basis, and this greatly alters the lives of the inhabitants.[5]

What makes these changes especially concerning is the particular type of soil found throughout East Kalimantan. For when deforestation, strip mining, or the planting of a monocrop like palm occur, particular difficulties are eventually encountered due to the ecology of the place and the chemical composition of the soil. Not being of a rich

[5] For the Dayak I lived with, the forest, the river, and the land is their life. They self-define as forest people and are intimately connected to their land, a connection that the West has long since lost, and one which has a difficult time being understood today. A sombre comparison is with the colonizers who took direct and mediated steps to exterminate the buffalo on the Great Plains of North American and thereby destroy the traditional lives of many Indigenous tribes in North America. Losing their forest, their traditional home and place in the world, is analogous to losing the buffalo and the ability to follow the herds for several of Canada's Indigenous tribes. It is not simply a change in a way of life, it is the wholesale destruction of a way of life.

volcanic composition like other islands in the Indonesian archipelago, to remain fertile the soils of East Kalimantan require either extensive fallow periods to rejuvenate nutrient levels, or an incredible amount of fertilizer – an amount that quickly outpaces the returns. For this reason fallow periods of up to fifteen years were observed by the Dayak inhabitants, as once an area is cleared, the debris burned, and a crop sown, the land can only be used for a number of sowings before it becomes so nutrient depleted that another patch of land must be cleared to grow crops.

This becomes especially important when it comes to planting palm. The overwhelming cause of deforestation and habitat destruction in East Kalimantan today, the planting of palm for oil production has combined economic, social and ecological ramifications that make it devastating for the Dayak and their (former) lands. Economically and socially speaking, the palm oil corporations pay villagers to plant palm trees on their own (the villager's) property, and then buy the seeds back to harvest the oil. This brings the villagers directly into the capitalist system through the rent and labour aspects of the agreement, and it shifts incentives in such a way that villagers tend to move away from planting more stable, less intensive crops to planting the more short-term, but financially lucrative, palm. Consequently, land that the corporations have not been able to legally obtain, they *de facto* own as they persuade villagers to plant palm and thus the corporation's production increases without increased legal land ownership, dragging the villagers and their traditional land into the production scheme with them.

Ecologically speaking, the first step in planting palm is to remove all existing vegetation by clearing the land with a bulldozer, or other similar means. This is due to the nature of the planting and the rationalized planning involved in monocrops like palm, not unlike what we see with monocrops such as wheat in Canada. All other plants and vegetation are completely removed so there is no competition for nutrients and water, and the plantations are laid out in a rationalized and 'efficient' plan with each tree planted the same distance from another. Pesticides, herbicides and fertilizers are then applied to control vegetation growth in and around the monocrop and to assist in its growth, and consequently any change in the ecology of the place could not be more complete than with a palm oil plantation (with the exception of mining which simply decimates everything by tearing the earth apart). The average age of a producing palm tree in East Kalimantan is roughly a dozen years. After this period the trees stop producing seeds of a high enough standard and become too tall for the seeds to be

efficiently collected by the workers. The trees are then abandoned, left only for the process of cutting, bulldozing, pesticides, herbicides, and fertilizers to occur all over again.

Again, because of the nature of the plantations and the poor soil quality, after a period of time fertilizer costs outstrip returns and the plantation becomes economically unviable. For without the underbrush and dense root system of naturally occurring vegetation, nutrients are washed away by the almost daily rain and the land becomes unable to support any type of complex vegetation. Consequently, plantations and palm oil corporations are economically viable only if they can continue to bring greater and greater swaths of land under their control, a cycle that results in the Dayak losing more and more of their traditional lands.

But this is not the only concern. The land which the plantations have so drastically changed, even if left alone today, does not naturally return to its 'climax' condition of a lush tropical rainforest. When the land is altered in such a manner, as natural vegetation does begin to appear again, a type of invasive wild grass (*imperata cylindrica*) establishes itself and swarms the land, inhibiting the growth of much that attempts to then grow, the grass itself being a strong monoculture. And, unfortunately, attempts to recover the original forest are intensive, costly, and time-consuming enough to make efforts prohibitive, thus making the conversion from grassland back to tropical rainforest almost impossible.

And while this process moves towards its obvious conclusion, what choices are left to the Dayak once the trees are cut down, the ores are mined, and the land rendered effectively dead? Buy the degraded land back? With no jobs and no income, as corporations are always the first to leave when profits disappear, this is unlikely to happen. Thus with no legal land to plant crops on and attempt to resume their former lives, they are seemingly left with two options: become squatters on what used to be their tribal land, or board a bus for the city and try to survive there with whatever skills they have.

Bereft of their land, their culture, and their homes, seemingly destined to become refugees in large, crowded cities like Balikpapan and Samarinda, the genocidal plight of

another Indigenous tribe is being replayed once again in this insufferable drama called Modernity.

Consequently, I came to Vancouver to study the Liberal Arts and write the essay that is before you. More precisely, I came to spend two years reading as widely as I could in the history of science, literature, philosophy, theology, sociology, economics, etc., so that I could better understand how this could be happening again. What the underlying philosophical justifications and overarching conceptual frameworks are that are allowing this situation to occur in Indonesia again today, just as it occurred in Canada in the past. I needed to understand why we 'Westerners' see the world the way that we do, and why we are so driven to share this vision (to put it euphemistically) with so many others. In sum, I came to Vancouver to continue on a quest not unlike that described by a biblical preacher, who wrote so eloquently and so fittingly, so many years ago:

> *I applied mine heart to*
> *know, and to search, and to*
> *seek out wisdom, and the reason*
> *of things, and to know the*
> *wickedness of folly, even of*
> *foolishness and madness.*[6]

As a third-generation Caucasian Canadian whose extended family lives and farms on ceded Treaty 6 Indigenous land, I am not mandated to wear my scarlet letter for the horrible injustices carried out against the Indigenous Peoples of Canada, but wear it I do. We, as Canadians, should be embarrassed and ashamed of what has gone on in the past in our nation, and even more embarrassed and ashamed that it continues under the same auspices in other parts of the world today.

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[6] King James Bible, *Ecclesiastes,* 7:25, (London, Eyre and Spottiswoode Limited).

General Introduction

The elevation of the mind ought to be the principal end of all our studies; which if they do not in some manner effect, they are of very little service to us.

Edmund Burke, *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful*

For the eye altering, alters all…

William Blake*, The Mental Traveller*

The main ideas presented in this essay are: how one sees the world matters, how one sees the world can change, and how one sees the world is determined by the sets of conceptual frameworks one sees the world through.

I have come up with the term *topoi* to describe and delineate these conceptual frameworks, and as such the *topoi* is the central concept of this essay. Properly defined, a *topoi* is a particular way of seeing and experiencing the world; it originates from a specific focal point of core concepts and ideas, and it branches outwards with rules, norms, and standards of behaviour to structure, mediate, and organize one's experience(s) of the world.

It is through and within the multiple and diverse *topoi* that humans connect with other humans, as it is through these frameworks that experience is collectively structured and words and actions become intelligible. It is by coming together and participating in the various *topoi* that humans come to make sense of the world, creating collective meaning and understanding whenever they meet together in *topoi*. A *topoi,* then, is akin to a collective lens through which people see and experience the world, and it is through these *topoi* that humans come to understand the world the way that they do.

While *topos* (plural: *topoi*) has a specific meaning in disciplines such as rhetoric, my use of the term is independent of this and the two are not to be conflated. As I explain below, I came to my conception of the *topoi* through reading the political anthropologist E.V. Walter and the philosopher Aristotle, and it is presented as a neologism independent of any other usage. Further, I use the term both in the singular and the plural, and when instances of potential confusion arise, I believe context makes my meaning clear.

In Aristotle's book *Topics, topoi* is commonly translated as 'commonplace,' and this translation was key for my conception of the *topoi.* For a *topoi,* according to how I define and use it, is a 'place' where people come together in common understanding; it is a 'place' in that it is where meaning is located and where meaning is to be found, and it is 'common' because these places are where people most often find themselves, thinking and visiting throughout their lives the commonly thought and visited places in

both the mental and the physical worlds. Therefore, *topoi* are the 'common' 'places' where people meet to find meaning and understanding.

In interacting with others on a daily basis, we all interact through and within *topoi.* If Aristotle states that wretched is he [sic] who is ostracized and finds himself without a state to call home, I go beyond Aristotle and state that wretched is she/he who finds themselves outside all *topoi.* For as I shall show in this essay, to be outside of a *topoi,* especially a dominant *topoi,* is to be incomprehensible to one's peers. And to live outside all *topoi* is necessarily to live as a solitary, ostracized individual, unable to understand or be understood by anyone else, as is the case with extremely mentally ill individuals.

There are commonplaces (*topoi*) in both the physical and the mental realms. Physical in that it is in commonplaces that people meet and where communal meaning is found, places like Mecca, Stonehenge, the local cenotaph, and the local pub. Mental because a commonplace is where meaning is found in a place of common understanding, places like Marxism, 9-11 Truthers, Intelligent Design, and Biochemistry. Again, they are 'common' because these are the places people most often *find* ourselves in, and to be outside of a *topoi* is to be 'un-common,' like when someone holds an uncommon opinion. This is to find oneself outside of the commonplaces of meaning and understanding, and it is also similar to being 'lost in the woods,' as the saying goes. To be lost in the woods is to be away from other *significant* places, places that are in fact common and are thus places of communal meaning. To be lost in the woods is to be outside these commonplaces; it is to be in an 'un-common' place, for when one is in a common place, one is seldom 'lost.'

Importantly, I posit an intimate relationship between the physical and the mental commonplaces and this relationship is what results in the world humans inhabit. However, in opposition to any notion of a Cartesian dualism, the two are so intimately interconnected that they are actually one. The physical 'places' humans find themselves in being physically manifest because humans have first been there mentally, and the mental 'places' humans are in being largely dependent upon the physical places they are then inhabiting. In other words, human beings continually build the world they have in their minds into the physical world they inhabit, and as they occupy these physical spaces it results in their thinking thoughts specific to these places. Consequently, place and mind are in constant dialectic with one another. Humans think the thoughts they do

largely because of the places they find themselves in, this results in these physical places changing over time, and this results in their mental commonplaces also changing over time. This dialectic I call the structure-behaviour dialectic.

It is an iterative process which continually creates and recreates both the physical and the mental *topoi.* Humans re-create their mental *topoi* through inhabiting the physical *topoi*, this results in the re-creation of the physical world, and this results in the mental *topoi* shifting once again. This dialectic results in a path-dependency whereby humans come to exist in the physical and mental places they do because they have mentally created these places through their past experiences of *topoi*. The world humans live in today, therefore, is directly connected to how they have seen and experienced the world in the past.

To repeat, then, a *topoi* is a particular way of seeing and experiencing the world based on core concepts which branch out with rules, norms, and standards of behaviour to structure, mediate, and organize one's experience of the world. A *topoi,* to put it another way, is like a monad: a self-enclosed and self-defining entity unto itself. However, unlike a monad, a *topoi* is not impenetrable or indivisible. While *topoi* are self-enclosed, self-defining, and self-governed according to their own rules, they interact with and overlap one another in a way that renders the current linear, rational analysis of social systems largely ineffective. Almost all humans live within multiple, self-referential *topoi,* within multiple ways of seeing and experiencing the world, and understanding this is crucial for understanding our world today.

My central argument revolves around the structure-behaviour dialectic and the continual interaction of mental and physical *topoi:* of how humans *see* the world and how they then *build* the world around them. I will argue that as the structure-behaviour dialectic results in continually changing social and physical realties, societies occasionally need to reformulate both how they collectively see the world and the place of humans in the world. More specifically, I will argue that as the structure-behaviour dialectic has today resulted in the prevailing vision of the world and the social and physical realities of the world falling out of sync with one another, modern society must today learn how to look at the world in a new way.

As mentioned above, I arrived at my conception of the *topoi* through two sources: E.V. Walter's *Placeways: A Theory of the Human Environment,* and Aristotle's afore-mentioned *Topics.*

Walter is a self-professed *topologist,* a lover of place, and it was through his use of the multiple derivations of *topoi* in *Placeways,* that I came to my conception of the physical *topoi.* Walter defines his study of *placeways* as *topistics,* and as I thought about his use of the concept a *placeway* began to look more and more like a commonplace to me. For a *placeway*, as I read it, is a physical place that human beings meet and find meaning in, and as people spend time in such a place, it begins to become a *part of them* through their experience of the place. As Walter puts it: "A place is a location of experience. It evokes and organizes memories, images, feelings, sentiments, meanings, and the work of the imagination. The feelings of a place are indeed the mental projections of individuals, but they come from collective experience and they do not happen anywhere else. They belong to the place."[7]

A physical place, then, over time and with continued exposure to the world and its development by individuals in their culture, becomes a *common*place; a place of collective experience that does not exist anywhere else as it is only in this specific place that these particular memories, images, feelings, sentiments, and meanings occur. Most importantly, when in a specific place individual mental projections are immersed in the collective experience of the place and therefore individual mental projections are *shaped by the place*. In other words, what the individual experiences in the place is dictated by the *common* experience of the place, or, put it the *topoistic* language used throughout this essay, the individual's experience is structured, mediated, and organized by the place.

The *placeway,* then, is a *topoi:* a specific place where humans mentally and physically organize their lives and find collective meaning. Such places are easily identifiable. Throughout the world and throughout history the places people meet – Mecca, Stonehenge, etc. – are the places most imbued with collective experience and, subsequently, with meaning. They bind history to themselves and human beings in

[7] Eugene Victor Walter, *Placeways: A Theory of the Human Environment.* (Chapel Hill: University of North Carolina Press, 1988), 21.

meaning in precisely the manner outlined by Walter: by assimilating individual mental projections within collective experiences.

For the mental *topoi* I was influenced by Aristotle. For it was in his *Topics,* in his rather dense exploration of how to delineate types of arguments based on his four predicables and the syllogism, that I first encountered the term *topoi* translated as a 'commonplace.' And while this translation was indeed influential, it was within the contents of the text itself that his ideas about the dialectical *topoi* shaped my conception of the mental *topoi.*

Aristotle argues that there are distinct methods for the different types of argumentation and that there are limits and boundaries to these 'commonplaces' which then determine the kind of dialectic one engages in. His *topoi* are 'common' because they are the specific places people must meet in order to engage in specific types of arguments, and it is only by coming together within one of these commonplaces that proper argumentation can occur. Consequently, as I read through Aristotle's work and saw how he structured his argument regarding the different argumentative commonplaces, I began to understand how humans, also, structure their thoughts and ideas around certain 'common' places, and that understanding and meaning emerge from humans being in the same 'common' place(s).

Further, when outlining the different dialectical commonplaces Aristotle also refers to the "commonplace rules" that structure each commonplace. This helped me to conceptualize the structure of my *topoi* as it allowed me to understand that *topoi* are likewise structured by rules, in that to use the particular rules of a particular dialectical commonplace incorrectly is to argue illogically. This also showed me that to be outside of the correct commonplace when arguing is to argue irrationally. In other words, this showed me that one must follow the rules and be within the correct realm (*commonplace/topoi*), or one will be incapable of participating in a logical dialogue with another. And these ideas, to act logically, illogically, and irrationally, became central to my argument of how a *topoi* structures-mediates-organizes one's experience of the world, ideas that are developed in greater detail in Chapter II through what I call the *realm of intelligibility.*

Aristotle's dialectic commonplaces have limits and boundaries just as there are limits and boundaries to every physical place. There are different rules, different techniques, and different methods (of arguing) for the different Aristotelian commonplaces, just as there are different rules, different techniques, and different methods (of acting) in different physical places. These rules are largely what structure, mediate, and organize what occurs in a given commonplace. For just as Aristotle's dialectic commonplaces are governed by different rules delineated by dialectic boundaries, the rules that structure one's behaviour in the parish parking lot are different from those that structure one's behaviour within the nave. And this, I argue, is due to the fact that words and actions in both places are governed by different rules, delineated and made manifest by specific boundaries.

It was also from reading about Aristotle and his *Topics* that I gained further justification for another central component of my *topoi*: that all *topoi* are based on certain, foundational concepts. This justification came from the second-century commentator on Aristotle, Alexander of Aphrodisias (circa: 200AD), through these words: "For the topic, as Theophrastus says, is a starting point or element from which we take the starting-points concerning each matter by focusing our thought upon it."[8] Likewise, both physical and mental *topoi* are based on certain "*starting points*" and it is from these that *topoi* branch outwards to structure and guide the behaviours and experiences of those within. Put another way, *topoi* emanate from a focal point within and cast themselves out from this centre, structuring and directing all that falls within its boundaries.

Aristotle's dialectical commonplaces, Stonehenge, Mecca, Marxism, and Intelligent Design all begin with certain, specific starting points which bring people to these commonplaces and which structure the experience of those within these places. Stonehenge, for all the mystery surrounding it, was erected because of certain concepts and still attracts people today for specific conceptual reasons. Mecca attracts the largest annual migration of human beings in the world and this is also for conceptual reasons. Marxism is based on conceptual foundations such as surplus value, inequality, and dialectical materialism which allow people within this *topoi* to see the world in a specific

[8] Alexander of Aphordisias, *On Aristotle Topics 1,* trans. Johannes M. Van Ophuijsen (London: Gerald Duckworth & Co. Ltd, 2001), 7; Theophrastus was Aristotle's successor at the Peripatetic School in Athens.

way. And Intelligent Design likewise starts from particular conceptual foundations such as the unexplainable complexity of the natural world to create a theory that supports an all-powerful Creator God and which then allows adherents to *see in the world exactly what their theory stipulates is there.*

Therefore, of both the mental and the physical *topoi* I can say this: they consist of particular starting-points and rules; they have limits and boundaries; they define, confine and clarify one's experience of the world; it is through their guiding and mediating influence that one comes to have meaning in their lives; humans live in the world they do because of the *topoi* that they collectively see and have seen the world through in the past; and it is because of the interaction between the mental and physical *topoi* that the structure-behaviour dialectic exists.

Importantly, and here I move into the second argument of this essay, it is because of the structure-behaviour dialectic that humans must learn to see the world from a new perspective today. As the interactions between mental and physical *topoi* are responsible for the structures, institutions, and norms and standards of behaviour that make up our world, as the prevailing mental *topoi* falls out of sync with emergent social and physical realities – as it necessarily must from time to time – humans must reformulate their overarching mental *topoi* by reconceptualizing how they are looking at and living in the world. They must occasionally come, that is, to a new overarching *topoi,* to a new way of seeing and experiencing the world.

In order to come to a new way of seeing and experiencing the world, what is needed is the ability to see beyond the existing *topoi* and recognize that which is hidden from the prevailing perspective. In order to do this what is needed is a *paradigm observer*. The paradigm observer is the person able to formulate a new vision of the world by seeing beyond the current, overarching *topoi* and in doing this they are able to articulate a new conception of the world and how humans are living in it. This is the person who comes to *see* the world in a new light and who is able to change how other humans collectively see the world through sharing this vision with others. There are, of course, great challenges with being the paradigm observer and with discovering and communicating this new way of seeing the world, and these ideas are central to all that follows.

Aristotle wrote the *Topics* to first delineate and then set the rules for the multiple areas/topics of dialectic argumentation, and as such his treatise is about methodologies pertaining to *specific* realms, under *specific* circumstances, delineating what is to be included as much as what is to be left out. In detailing this Aristotle was also clear that there is no single, dominant line of inquiry to which all arguments must eventually cede:

> But we must not on this account expect to find a single line of inquiry which will apply universally to them all; for this is not an easy thing to find, and, even were one found, it would be very obscure indeed, and of little service...Rather, a special plan of inquiry must be laid down for each of the classes we have distinguished, and then, starting from what is appropriate in each case, it will be easier to make our way right through the task before us. So then, as was said before, we must outline a division of our subject, and other questions we must relegate each to the particular branch to which it most naturally belongs.[9]

Just as there is no single line of inquiry that universally deals with all arguments, I will argue throughout this essay that there is no single *topoi* that is superior to and which supersedes all others. As much as one may wish to believe there is a single, superior way of looking at the world, of being in the world, this is as much a remnant of the Platonic-Christian-Judaic outlook as it is anything else. It is also one of the main reasons why humans live in the world they do today.

Such a reductionist, panacea approach to understanding the world is fallacious, and it is responsible for much hurt, harm, and hate in the world today. While the prevailing, hegemonic *topoi,* which originated in the West, largely presumes there is a 'right' way of seeing the world, of living one's life, of arriving at an objective Truth, presumes, that is, that such a universal line of inquiry exists, it is in opposition to this reductionist mentality that I propose the *topoistic* perspective. With this I propose that all *topoi* are unique, that there is a multiplicity of *topoi* throughout the world, and that each

[9] Aristotle, "Topics," in *The Complete Works of Aristotle: The Revised Oxford Translation,* ed. Jonathan Barnes, trans. W.A. Pickard. (Princeton, New Jersey: Princeton University Press, 1991), 171.

needs to be understood and appreciated on its own terms – not in terms dictated by another *topoi* supposed to be 'better' in some regard.

More specifically, I propose that due to the structure-behaviour dialectic modern societies must come to see the world from a new perspective as the world has changed because of this prevailing *topoi*, and because this prevailing *topoi* is itself built upon this reductionist, isolationist way of looking at the world, the *topoistic* perspective is proposed as a first step in learning to see the world anew. It is proposed as an heuristic for enabling one to see beyond this reductionist *topoi* and see the plurality and diversity of equally-valid *topoi* that exist in the world today.

The *topoistic* perspective shows that the vast majority of humans see and experience the world through more than one *topoi.* Through the nation-state, union-member, tax-payer, scientist, political-party-supporter, church-member, Hindu, sports-enthusiast, anarchist, and so many more, human beings simultaneously and concurrently see and experience the world on these different levels. Consequently, it is this superimposition of *topoi* upon *topoi* which renders the dominant reductionist *topoi* insufficient for understanding our social world, and if due to the structure-behaviour dialectic there are issues and concerns in the world today that current methods and mentalities seem insufficient to solve them, what I propose is that *the perspective may be the problem*.

The *topoistic* perspective contains three aspects – outlined in detail in Chapter III, Section II – which enable one to see and understand the *topoistic* nature of the world by seeing that all *topoi* have the capacity to **change** over time (how one sees the world can change); that there is a **plurality** of self-referential and incommensurable *topoi* in the world (how one sees the world matters); and that all *topoi* are built upon certain **conceptual foundations** (how one sees the world is based on conceptual frameworks).

I, of course, am not the paradigm observer and this essay will not detail how one may come to see the world anew today. I remark only on the general process involved in this coming to see that which is hidden, a process which, incorporating all the concepts outlined in this Introduction, unfolds like this: How one sees the world is through *topoi*. How one's vision of the world changes is by coming to see that which is hidden and one does this by recognizing that which is beyond the prevailing *topoi.* How one may first

come to see the world beyond the prevailing *topoi* today is by understanding the *topoistic* nature of the world as presented through the *topoistic* perspective. Due to the structure-behaviour dialectic, modern societies are currently looking at the world through the wrong lens, through the wrong *topoi*, and it is the *paradigm observer* who is able to see that which is hidden and arrive at a new vision of our world and humanity's place in it.

The extended essays are presented in three Chapters. Chapter I will look at Charles Darwin and how his theory of evolution by natural selection became a *topoi* through which he came to see the world. I am asking in this Chapter to what extent one can '*see'* their theories in the world before one begins to be speaking analogically or metaphorically. Chapter II will look at Homer's *The Iliad* and highlight how Achilles came to step outside of his collective's dominant *topoi.* I argue that Achilles came to a different conception of reality by rejecting the conceptual foundations of his warrior society, and that this left him and his peers in a situation whereby they were unable to understand one another. Chapter III will offer theoretical emphasis for the ideas put forth in the first two Chapters and will develop the ideas associated with the *topoistic* perspective, the paradigm observer, and how one may to see the world anew by seeing that which has remained hidden.

Chapter I: Darwin, Analogy, and the Theory of Evolution by Natural Selection

Men have frequently adhered with great tenacity and vehemence to the hypotheses which they have once framed; and in their affection for these, have been prone to overlook, to distort, and to misinterpret facts.

William Whewell*, The Philosophy of the Inductive Sciences*

The human mind is an inveterate analogizer. We are compulsively drawn to see meaning in slight similarities between very different processes…Darwin applied the idea of evolution in a discriminating way to living organisms changing in body form over countless generations. His successors have been tempted to see evolution in everything; in the changing form of the universe, in developmental 'stages' of human civilizations, in fashions in skirt lengths. Sometimes such analogies can be immensely fruitful, but it is easy to push analogies too far, and get overexcited by analogies that are so tenuous as to be unhelpful or even downright harmful….On the other hand, some of the greatest advances in science have come about because some clever person spotted an analogy between a subject that was already understood, and another still mysterious subject. The trick is to strike a balance between too much indiscriminate analogizing on the one hand, and a sterile blindness to fruitful analogies on the other.

Richard Dawkins*, The Blind Watchmaker*

Introduction

Charles Darwin (1809-1882) was both a remarkable scientist and a remarkable thinker. The depth of his knowledge and his wide erudition allowed him to put forth a scientific theory that in its extent and influence can be eclipsed only by the likes of Isaac Newton and Albert Einstein. As it has often been remarked, the world became a different place after the publication of his landmark book, *The Origin of Species* (1859).

This Chapter, however, will not be discussing Darwin's accomplishments. Here I look at the Darwinian corpus from another perspective, asking whether Darwin was guilty of seeing too much of his theory of evolution by natural selection in the world as he attempted to explain more diverse phenomena with his theory. More specifically, I will explore whether in *The Descent of Man* (1871) and *The Expression of the Emotions in Man and Animals* (1872), Darwin attempted to account for phenomena in the psychological and the sociological realms through his mechanism of natural selection, and if in doing this he began to speak out of context.

The focus here is on how Darwin may have come to see the world through the *topoi* of the theory of evolution by natural selection and how this affected his later works. This Chapter, then, explores the risks involved in being overly reliant on a single *topoi* for seeing and experiencing the world, and the futility of attempting to reduce a diverse range of phenomena down to a single explanatory mechanism – something which is itself the result of seeing and experiencing the world through a reductionist *topoi*.

In addressing these topics, however, one encounters considerable difficulties. Due to the intricate and difficult nature of the subject matter Darwin and Darwinian evolution are areas of serious intellectual disagreement. The string of caveats that winds its way through the Chapter attempts to account for this. Importantly, I am not attempting to refute Darwin and state that he was wrong about this or wrong about that, as this is well beyond both my intellectual capabilities and the boundaries of this Chapter. Rather, this is an inquiry based on Darwin and his work that looks into how one sees the world through certain *topoi*, and how a particular worldview can result in one detecting patterns where said patterns might not actually exist.

This Chapter looks specifically into the nature of analogy and metaphor, asking that if something is *like* something else, while not *being* this something else, how far

should one let this influence their worldviews and beliefs when one is considering theories and explanations in distinct intellectual realms? I argue that as one sees the world through particular conceptual frameworks one reduces their overall vision and understanding of the world through an over-emphasis on a single, particular *topoi*. For after reading several of Darwin's texts it appeared to me that he came to see the world through and in terms of his theory of evolution by natural selection, and in realizing this I recognized Darwinian evolution as a *topoi:* a way of structuring, organizing, and mediating a person's experience of the world based on certain core concepts.

This Chapter suggests that when a person discovers a way of seeing the world, and as they become more convinced of its legitimacy, they can begin to see justification and evidence for it in all places. As Darwinian theory today has spawned not a cottage industry, but a full-fledged metropolis housing an assortment of schemes and hypotheses from evolutionary psychology, to evolutionary economics, to memetics to sociobiology, all of which take Darwin and his theory of evolution by natural selection as their foundation, my concern is when social scientists, specifically, conduct research and construct theories and hypotheses about the social world, they need to be confident that they are viewing the world through a somewhat disinterested framework and are not being overly reliant on theories and ideas from the natural sciences in framing their understanding. For the social sciences are not simply derivatives of the natural sciences, and different areas of study require different methods and techniques in order to arrive at justifiably relevant theories and conclusions, a judgment Aristotle made not only in his *Topics,* but also in his treatise *On the Soul*:

> If there is no such single and general method for solving the question of essence, our task becomes still more difficult; in the case of each different subject we shall have to determine the appropriate process of investigation. If to this there be a clear answer, e.g. that the process is demonstration or division, or some other known method, many difficulties and hesitations still beset us – with what facts shall we begin the inquiry? For the facts which form the starting-points in different subjects must be different.[10]

[10] Aristotle, "On the Soul," in *The Complete Works of Aristotle: The Revised Oxford Translation,* ed. Jonathan Barnes, trans. J.A. Smith. (Princeton, New Jersey: Princeton University Press, 1991), 641.

To explore analogy, metaphor, and 'reality' in regard to Darwin, Section I looks at English polymath William Whewell's (1794-1866) Consilience of Inductions, a philosophy of science that I believe had a considerable impact on Darwin. Section II looks at two more of Darwin's influences, German writer Johann Wolfgang von Goethe (1749-1832) and English clergyman William Paley (1743-1805), and outlines how Darwin came to use analogy in three separate, though related, ways: the methodological, the philosophical, and the rhetorical. Section III offers a three-tiered classificatory scheme to argue that as Darwin extended his theory of evolution by natural selection outwards in the attempt to explain a greater diversity of phenomena, he went from speaking concretely about phenomena in the biological realm, to speaking isomorphically, then analogically, and then finally, in regard to human social collectives, metaphorically.

My analysis is premised on the notion that Darwin wished to become the Newton of Biology and sought an underlying principle similar to Isaac Newton's (1642-1726) universal law of gravitation that would account for all the diversity and variety found in the biological realm. I argue that Darwin was influenced by Whewell's Consilience of Inductions to extend his theory outwards so that he could better cement its status as a universal law; that to arrive at such a Consilience he had to take several 'leaps' and rely on several different types of analogy; and that his wide use of analogy may have resulted in his *seeing* his theory in realms that it did not necessarily belong.

Section I – Darwin's Goal and the Consilience of Inductions

The topic of Darwin's primary influences is much attested to in the literature, and is still being debated today. While most general readers are familiar with the likes of the geologist Charles Lyell (1797-1875) and scholar Thomas Malthus (1766-1834), there exists no clear consensus about the extent and profundity of Darwin's other influences. In a recent book, *Debating Darwin,* two of the world's preeminent Darwin scholars, Robert J. Richards and Michael Ruse, argue back and forth about who/what influenced Darwin the most: his Victorian upbringing (Ruse) or German Romanticism (Richards). These two eventually become so divided in their opinions that Ruse writes late in the book, "reading Richard's essay and then rereading my essay, I am struck by how completely different are our two visions. Let there be no mistake, to use a hackneyed term, Richards and I are in different paradigms in shaping this essay."[11]

I begin with this quote for two reasons: first, because it quickly reaffirms the extent of disagreement and lack of consensus on so many things Darwin; and second, because Ruse sets important precedents for the rest of this essay by introducing key *topoistic* themes through his use of the words "visions" and "paradigm." I use the term 'vision' abundantly throughout these pages, and while I try and refrain from using the term paradigm, both of these words are connotative of a *topoi.* They both evoke the notion that there are distinct ways of viewing phenomena, and thus from a *topoistic* perspective what Ruse is stating is that he and Richards are looking at Darwin and his influences through different *topoi.* This looking at Darwin and his influences through divergent *topoi,* I suggest, is what results in their *seeing* the Darwinian corpus from such different perspectives.

However, to try and make this a bit clearer, I will describe how their different perspectives structure, organize, and mediate their interpretation of Darwin, giving readers an early glimpse of how a *topoi* functions. First, each has a different 'starting

[11] Although, the spirit of the book was much different early on. This from the Preface: "We both take on questions of historical context and philosophical interpretation, and recognize that our disagreements are more profound and more interesting than simple disputes about disciplinary methods. We are not talking past each other but right at each other. Yet each comes to quite different conclusions and thinks the other has simply been wandering in the intellectual wilderness." Michael Ruse and Robert J. Richards, *Debating Darwin.* (Chicago: University of Chicago Press, 2016), ix. People in different paradigms (*topoi*), as we will see in Chapters II and III, are not talking at each other, but are indeed talking past one another (Ruse and Richards, *Debating Darwin*, 177).

point' for his interpretation, one choosing the German Romantic tradition (Richards) and the other Victorian England (Ruse). These foundations then *structure* their interpretations by guiding their argument, much like a framework or lens, by essentially telling them *what* they are going to see when they look into the Darwinian world.

For once these foundations are either chosen or arrived at, each then sees the Darwinian world in terms of what he takes to be the 'facts,' and each will then spend a disproportionate amount of time analysing the Darwinian corpus in terms of these core 'facts.' Thus they will, either consciously or unconsciously, tend to *see* material that enhances their own argument, while directing them away from seeing the 'facts' which detract from their argument. Structurally, a *topoi* tells one *what* to focus on and pay attention to in the world, and this initial determination of *what* to focus on has a immense influence on what will then be seen. Put another way, when Richards looks at the Darwinian world *what* he *sees* is a German Romantic influence; when Ruse looks at the same world *what* he *sees* is a Victorian England influence.

Both Ruse and Richards are capable enough intellectuals to make good arguments for why they believe what they believe regarding Darwin's influences, and this is seen in the book. Each presents a compelling argument for who and what influenced Darwin the most, both using impressive scholarship and in-depth research to 'discover evidence' that supports their argument. Because there can be no *definitive* answer to who/what influenced Darwin the most, each man makes his interpretation based on what he knows and believes and this stems from his initial foundations and it results both in the ability to find evidence to support their argument and in their final argument.

This highlights the idea of directionality and how a *topoi organizes* how a person sees and experiences the world. The idea here is that for each, the direction their future research will take is largely determined by the foundational concepts that they have chosen. If Richards believes that Darwin's chief influences were from the German Romantic tradition, this will result in research being carried out seeking to support and emphasize this. This is what *direction* his research will take. Richards will not likely start doing research and publishing papers about Darwin's Victorian England influences because this is not how he *sees* the Darwinian world. What he *sees* is German Romanticism and therefore this is the *logical* direction his research will take in the future.

The mediational aspect of a *topoi* determines what is seen and experienced in the world in the now, and it works in such a manner that if Ruse sees a Victorian England influence he will necessarily see the Darwinian corpus in light of this influence. In other words, what he believes *mediates* how he then sees the world. For example, if scholarly material was uncovered that stated Darwin had a chance meeting with an expert on German Romanticism one weekend in London, Richards would likely be interested to know more about such a meeting, whereas Ruse would see little of interest in it. This is because particular *topoi* mediate material in the now and function as an heuristic to help determine what is important and what is unimportant. Because of this a *topoi* also has the ability to 'block out' material that does not accord with one's view and thus interpretations such as Richards and Ruse become more divergent.

This mediation allows each to shut out what he believes to be unimportant, and focus instead on what is already believed to be important, on *what* the structural aspect of their *topoi* has *directed* them to focus upon. Because of the limiting nature of *topoi* and how one is not able to mentally incorporate *everything* into one's theories, one has to make choices. Not everything can be important to every individual and a *topoi* erects conceptual boundaries which mediate *how* an individual evaluates specifics in the world in the now. As a single *topoi* is only able to let in certain aspects of reality, as no way of seeing and understanding the world can incorporate everything, this is necessarily how one comes to see and experience the world through specific lenses.

Importantly, the same phenomena can have radically different *meaning* to two observers, and this is due to the conceptual frameworks they each see and experience material/phenomena through, exactly what I am attempting to highlight with Ruse and Richards.[12] This, then, begins one on the path to *topoistic* understanding by showing how two scholars, dealing with the same material, can view matters so differently. Ruse and Richards are both great Darwin scholars, but in regard to his chief influences they each see the Darwinian world in strikingly different ways, and this is due to how they conceptually approach the Darwinian world.

[12] Expanded on in Sections V and VI of Chapter III with the idea of the '*Gestalt'* switch and how two people can *see* and understand something completely different when looking at the same objects/phenomena.

I stated earlier that Darwin wanted to be the Newton of Biology, and this is a statement Michael Ruse agrees with. Writing in *Debating Darwin*: "Immanuel Kant said that there could never be a Newton of the blade of grass. Darwin was determined to show him wrong."[13] In order to prove Kant (1724-1804) wrong, Darwin believed he had to provide an empirical, scientific answer to three, interconnected questions: how nature operates without an intelligent designer; the origin of man [sic]; and how to materialistically account for all the diversity and complexity of the biological world.[14]

Newton, of course, was the grand synthesizer of Italian physicist Galileo Galilei (1564-1642), Danish astronomer Tycho Brahe (1546-1601), and the German mathematician Johannes Kepler (1571-1630), bringing together and combining their work into a single system that mathematically explained motion and gravitation. More specifically, he brought together empirical data from myriad fields, incorporated it all together, and then with a single, elegant summation known simply as the *Principia,* demonstrated to the world what is still regarded by some as the most remarkable intellectual achievement ever made by a single human being.

Darwin looked at Newton's triumph, largely through the philosophical and scientific works of William Whewell and fellow English philosopher John Herschel (1792-1871), and wished to emulate him by discovering *the* explanation for the three questions laid out above. And when he believed that he had accomplished this, after having his hand famously pushed by the co-discover of natural selection Alfred Russell Wallace (1823-1913), he attempted, like Newton, to present his findings with a systematic explanation, based on a few simple principles, by way of a single mechanism, in a single book. An explanation that is known today simply as the *Origin.*

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[13] Ruse and Richards, *Debating Darwin*, 34.

[14] "Darwin realized that he needed a mechanism to explain his newfound belief. As a graduate of the University of Cambridge, he was aware of the triumphs of its greatest scientist, Isaac Newton. Darwin therefore sought for the organic world a kind of equivalent of Newton's universal law of gravitation. He found his answer in September 1838." Michael Ruse, "Darwin, Charles," in *Evolution: The First Four Billion Years,* ed. Michael Ruse and Joseph Travis, 506 (Cambridge, MA: The Belknap Press of Harvard University Press, 2009); It was in September 1838 that Darwin famously read the English cleric Thomas Malthus (1766-1834). See footnote 36, below.

And when one takes up the *Origin* one can indeed find evidence that Darwin believed he had accomplished his task:

> The fact, as we have seen, that all past and present organic beings constitute one grand natural system, with group subordinate to group, and with extinct groups often falling in between recent groups, is intelligible on the theory of natural selection with its contingencies of extinction and divergence of character. On these same principles we see how it is, that the mutual affinities of the species and genera within each class are so complex and circuitous…The real affinities of all organic beings are due to inheritance or community of descent. The natural system is a genealogical arrangement, in which we have to discover the lines of descent by the most permanent characters, however slight their vital importance may be.[15]

Darwin gave himself quite the task. If he was going to manage it, he would need to rely on knowledge and evidence from a wide range of disciplines – geology, physiology, embryology, anthropology, morphology, taxonomy, anatomy, political economy, ecology, botany and more – and then combine these various strands together to present his theory. And in order to understand how Whewell influenced Darwin in his attempt to accomplish this, one needs to look more directly at what is meant by Whewell's Consilience of Inductions.

The term consilience is today mostly associated with the Harvard Biologist Edward. O. Wilson, after Wilson published a controversial 1998 book of the same name.[16] However, both the concept and the philosophical justification behind it come from Whewell's 1840 *The Philosophy of the Inductive Sciences*. In this book, Whewell presents his Consilience of Inductions by claiming that the more seemingly independent phenomena a theory can subsume under its explanatory power, the stronger becomes the theory. Put more technically, if a theory explaining phenomena 'A' in one realm turns out to also explain phenomena 'B' in another realm, then it is likely a strong theory as it is able to explain a greater diversity of phenomena. This idea is itself premised on the reductionist ideal that universal theories exist, and the central idea is that greater the

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[15] Charles Darwin, *On the Origin of Species* (Oxford: Oxford University Press, 2008), 352.

[16] In the book Wilson postulates that science and its methodology will eventually be able to explain all phenomena, including the social sciences and the arts. Wilson is not alone in holding, or having held, such beliefs. Another contemporary example is the Nobel Laureate, American Physicist Steven Weinberg and his Theory of Everything hypothesis.

diversity of phenomena a single theory can explain the closer it comes to being a universal theory, and hence the 'better' the theory is.

The merits or follies of such an approach aside, the meaning behind the phrase and its importance to Darwin's methodology is found within the terms themselves, and understanding what Whewell is postulating takes little more than understanding the words that comprise it. Consilience means 'coming together' 'or 'jumping together,' and 'of Inductions' refers to the different realms of the inductive sciences. Therefore, the Consilience of Inductions simply means the 'coming together' of the different realms of the inductive sciences through a single set of underlying principles, or laws. This is why when both phenomena 'A' and phenomena 'B' come to be explained by the same underlying principles, it is a Consilience of Inductions. 'A' and 'B' are each representative of a different branch of the inductive sciences, thought beforehand to be unrelated, and by bringing them together with a single explanation one achieves a Consilience of Inductions. This is precisely what Newton achieved in regard to motion and gravitation in his *Principia* as he united the terrestrial and celestial spheres into one coherent system, and this is what Darwin set out to achieve when he went searching for the mechanism that would prove the world had no designer; that would reveal the origin of man [sic]; and that would provide a naturalistic explanation for all the diversity and complexity of the biological world.

Whewell's Consilience of Inductions implies is that there (possibly) exists an underlying connection between different sets of phenomena, and the responsibility of the scientist is to discover the mechanism which links everything together. As the theory which is able to explain the most is naturally that which incorporates the widest range of diverse phenomena, the legitimacy of a theory grows as its explanatory domain expands. Consequently, there is an inherent drive in science to 'push' a theory out further to subsume a greater range of phenomena under its explanatory umbrella as this brings it closer to being an absolutely accurate theory. As Whewell describes it in *The Philosophy of the Inductive Sciences*:

> We have here spoken of the prediction of facts of the same kind as those from which our rule was collected. But the evidence in favour of our induction is of a much higher and more forcible character when it enables us to explain and determine cases of a kind different from those which were contemplated in the formation of our hypothesis. The instances in which this has occurred, indeed, impress us with a conviction that the truth of our

> hypothesis is certain. No accident could give rise to such an extraordinary circumstance. No false supposition could, after being adjusted to one class of phenomena, so exactly represent a different class, when the agreement was unforeseen and uncontemplated. That rules springing from remote and unconnected quarters should thus leap to the same point, can only arise from that being the point where truth resides.[17]

Darwin was focused on finding *the* single explanation that would reduce the above three queries to a single set of explanatory principles, ultimately to the single mechanism of natural selection. Whewell's consilience promoted these reductionist ideals, and I believe Darwin inherited these views from Whewell when it came to formulating his theory of evolution by natural selection. For once again, if one turns to the *Origin,* one can find evidence supporting such a proposition: "It may be asked how far I extend the doctrine of the modification of species. The question is difficult to answer, because the more distinct the forms are which we may consider, by so much the arguments fall away in force. *But some arguments of the greatest weight extend very far*. *All the members of whole classes can be connected together by chains of affinities, and all can be classified on the same principle, in groups subordinate to groups*" [18] (emphasis added).

Based on this, it seems that Darwin was indeed influenced by Whewell's ideas when he wrote the *Origin*.[19] The difficulty with these ideas however – perhaps the inherent danger lurking within them – is that one can be tempted to take Whewell's Consilience of Inductions too enthusiastically and, being tempted by analogy and analogical reasoning (Section II below), begin to *see* their theories in the world not necessarily because they are there, but because one comes to *believe* they are there – or, perhaps more dangerously, because one desperately *wants* them to be there. Consequently, as there appears to be a desire on the part of scientists and researchers to find parsimonious, universal laws, and as the greatest glory is reserved to those who

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[17] William Whewell, *The Philosophy of the Inductive sciences, Founded Upon their History* (London: J.W. Parker, 1840), 230, https://catalog.hathitrust.org/Record/006292390.

[18] Darwin, *The Origin,* 355.

[19] In Chapter III I quote American philosopher E.A. Burtt (1892-1989) stating that all thinkers who came after Newton had to think through the world that Newton created, the primary characteristic of a paradigm observer. Whewell and Darwin are both to be included in this as they were both heavily influenced by Newton, their fellow Cambridge graduate.

'explain' the most, this can lead very capable minds to believe that unrelated phenomena are in fact not only related, but are explicable through the same underlying mechanism.

Whewell himself warns of the dangers inherent in his ideas, however, and how a theory once presumed to be true can turn out to be much more complicated as more phenomena are brought under its rubric. As a theory is pushed further outwards, 'anomalies' can begin to appear that ebb away at its veracity, and eventually its initial truth and hoped-for universality start to seem a slightly more muddled affair. Speaking in regard to the fluid and shifting nature of scientific theories, something encountered in greater detail in Chapter III, Whewell writes with great foresight and understanding in stating:

> This being the mode in which theories are often framed, we have to notice a distinction which is found to prevail in the progress of true and false theories. In the former class all the additional suppositions tend to simplicity and harmony; the new suppositions resolve themselves into the old ones, or at least require only some easy modification of the hypothesis first assumed: the system becomes more coherent as it is further extended. The elements which we require for explaining a new class of facts are already contained in our system. Different members of the theory run together, and we have thus a constant convergence to unity. In false theories, the contrary is the case. The new suppositions are something altogether additional; - not suggested by the original scheme; perhaps difficult to reconcile with it. Every such addition adds to the complexity of the hypothetical system, which at last becomes unmanageable and is compelled to surrender its place to some simpler explanation.[20]

[20] Whewell, *Philosophy of the Inductive Sciences*, 233-34; These ideas seem to raise some problems for Darwin's theory as it was later presented in *The Descent of Man.* In this work Darwin goes to great lengths to incorporate humans into his evolutionary framework through the principle of sexual selection, and for anyone who has ever read it (or simply held a copy in their hand), this addition to his theory does not seem to represent a shift to greater coherency. It seems to add a great deal of complexity to the theory and thus moves it in a decidedly different direction than towards greater coherency and simplicity.

Section II – Darwin's Three Uses of Analogy

Here I describe Darwin's three uses of analogy in positing his theory of evolution by natural selection: the methodological, philosophical, and rhetorical. I begin with Goethe and his conception of the Archetype from *The Metamorphosis of Plants* (1790), outlining how this influenced Darwin methodologically. I then examine the differences between analogical reasoning and logical deduction to explain why Darwin *necessarily* had to rely on analogy in expounding his theory. I finish by looking at the Archdeacon William Paley, his use of analogy in *Natural Theology* (1802), and the impact that Paley and his rhetorical use of analogy had on Darwin. While the preceding Section looked at how Darwin was influenced by the likes of Newton and Whewell to reduce the diversity of the biological realm down to a single explanatory mechanism, natural selection, this Section highlights how Darwin needed to rely on several different types of analogy to accomplish this, and how this resulted in him taking a great many 'leaps' to arrive at his mechanism.

In endeavouring to emulate Newton and attain a scientific reduction of the biological realm, Darwin needed to accumulate and synthesize evidence from disparate intellectual spheres, something that led him to rely heavily on analogy. This one knows, once again, directly from Darwin himself, for in one of the most famous (and later edited) passages from the *Origin,* Darwin announces both that he has achieved this reduction, and he makes his reliance on analogy unambiguous:

> Analogy would lead me one step further, namely, to the belief that all animals and plants have descended from some one prototype. But analogy may be a deceitful guide. Nevertheless all living things have much in common, in their chemical composition, their germinal vesicles, their cellular structure, and their laws of growth and reproduction. We see this even in so trifling a circumstance as that the same poison often similarly affects plants and animals; or that the poison secreted by the gall-fly produces monstrous growths on the wild rose or oak-tree. *Therefore I should infer from analogy* that probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed by the Creator[21] (emphasis added).

[21] Darwin, *The Origin,* 356.

Therefore, having made this clear, I begin with Goethe and his concept of the Archetype, suggesting that this gave Darwin the impetus to use analogy in a methodological manner, and that this methodological use of analogy enabled Darwin to arrive at the idea of descent from a common ancestor. However, before beginning a caveat is in order. While a direct line from Goethe to Darwin is difficult to trace, I have arrived at this connection by a more circuitous route, one which I still believe sufficient for my purposes.

Darwin's methodological use of analogy was combined with the later distinction between homologous and analogous traits and this enabled Darwin to arrive at descent by modification from a single, common ancestor. I describe this as a methodological use of analogy because it was through the methodological principles embedded within these concepts that Darwin came to *think* analogically and he then relied on this specific manner of thinking as a methodology: looking into traits and characteristics of plant and animal forms for entities that were similar enough to be considered analogous – this is *like* that – as opposed to what is constant and underlying (homologous). In coming to *think* in this manner Darwin was then able to *see* these characteristics in the plant and animal world when he carried out his research, and this was crucial for his theory. To use terms which are expanded on below, Darwin used this type of analogy as a methodology to understand the difference between characteristic traits (homologous) and adaptive traits (analogous), and the principles and methods behind this originally came from Goethe.

Goethe and his ideas were influential across the entire biological spectrum in 19th century Europe. So great was his influence that Professor Gordon Miller paraphrases German scientist Hermann von Helmholz (1821-1894) in stating: "after the publication of *On the Origin of Species* in 1859, Helmholz said that Goethean morphology had so shaped nineteenth-century biology that it paved the way for Darwin's theory."[22] A statement like this, coming from a man of Helmholz's scientific and intellectual repute, cannot be underestimated. Helmholtz was intimate with the highest circles of European science and learning, and of such intellectual capacity that he would have been able to

[22] Gordon Miller, introduction to *The Metamorphosis of Plants,* by Johann Wolfgang von Goethe. (Cambridge MA: The MIT Press, 2009), xxiv.

discern influences within texts to a considerable degree. As Helmholtz undoubtedly read both Goethe and Darwin, for him to make such a statement should thus speak volumes.

Robert J. Richards agrees with the idea of such a Goethean influence, writing once again in *Debating Darwin*:

> In the *Origin,* Darwin deployed the idea of the archetype in the penultimate chapter, in the section on morphology, where he reiterated his contention that archetypal structures – for example, the topological similarity of bones in the wing of a bat and the paddle of a porpoise – represented, not an idea in the mind of God, but a feature of the common ancestor. Significantly, Darwin drew support for his view by appeal to Goethe's theories of the ideal plant and the vertebral theory of the skull.[23]

While the terms here may be a touch confusing, one need not be too concerned with this at present. For now, I need to pause on the significance of this statement for again we can find clear evidence in the *Origin* that Darwin did indeed look for the underlying structures, the Archetypes, that were not subject to adaptation through natural selection and which subsequently served as the key to understanding descent from a common origin. Here are the words that I purposely omitted from a quotation from the last chapter of the *Origin* in Section I (pp. 20): "We see why certain characters are far more serviceable than others for classification; - why adaptive characters, though of paramount importance to the being, are of hardly any importance in classification."[24]

To unite these terms with those used above, the 'certain characters' that Darwin singles out are homologous traits and the 'adaptive characters' nonhomologous, or analogous traits. The homologous parallels Goethe's conception of the Archetype, in that these are the entities which hold the *underlying* commonality through which taxonomic classification is possible. The analogous is the adaptive and that which varies the most through descent, and while important for understanding evolution and how plants and animals change over time, they are not of chief importance for classification. Adaptive characteristics are central to the argument from design but Darwin effectively

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[23] Ruse and Richards, *Debating Darwin,* 107.

[24] Darwin, *The Origin,* 352.

inverted these ideas and looked for that which was constant in order to make his argument of descent from a common ancestor.

In order to differentiate between the analogous (adaptive) and the homologous (certain), Darwin had to learn to think *analogically,* and this he did by using analogy as taxonomic methodology. And as Richards affirms above, Darwin was clearly thinking this way in the *Origin,* where "*he reiterated his contention that archetypal structures…represented…a feature of the common ancestor*." (pp. 26) Therefore, Darwin was obviously thinking in terms of an unchanging and constant underlying all the change and diversity he witnessed in the world's biological diversity, and by learning to *think* in this manner and then look for these key taxonomic characteristics, he was able to *see* such distinctions in nature and thus arrive at descent from a common ancestor.

The connection to Goethe's thought can be drawn out in the following excerpt from professor David Seamon's essay "Goethe, Nature, and Phenomenology: An Introduction": "Goethe argued that, in time, out of commitment, practice, and proper efforts, the student would discover the 'ur-phenomenon' (*Urphanomen*), the essential pattern or process of a thing. *Ur-* bears the connotation of primordial, basic, elemental, archetypal; the ur-phenomena may be thought of as the 'deep-down phenomenon,' the essential core of a thing that makes it what it is and what it becomes."[25]

While this shows clear commonalities in Goethe's thought and in the methodology and ideas that Darwin adopted, it does not show that Darwin arrived at these ideas from Goethe. It could, in fact, be nothing more than a coincidence. However, a connection between the two can indeed be discovered by examining Darwin's relations with two British scientists, Richard Owen (1804-1892) and John Stevens Henslow (1796-

[25] David Seamon, and Arthur Zajonc, ed., *Goethe's Way of Science: A Phenomenology of Nature* (Albany, NY: State Univ. of New York Press, 1998), 4; Seamon is highlighting the idealistic aspect of Goethe's thinking in that this ur-phenomena was an underlying, non-materialistic entity. Darwin did not use the ideas in this sense. As I outline it here, Darwin used these ideas more *methodologically*, as Darwin's is a naturalistic theory. Goethe's idealism and Darwin's different use of such ideas is also referred to in the above quote from *Debating Darwin* (pp.26) where Richards writes that for Darwin this underlying entity "represented, not an idea in the mind of God, but a feature of the common ancestor." These ideas are touched on again below (cf. footnote 31). While important, this difference between Goethe's idealism and Darwin's naturalism does not concern the present analysis.

1861). We begin with Darwin's Cambridge mentor Henslow, and another quote from *Debating Darwin,* this time from Michael Ruse:

> Darwin did not take a science degree. There was no science degree. However, for three years he attended Henslow's botany lectures, so increasingly he was learning about the physiology of plants…Classification was also important with Darwin learning that often the way to classify is by digging beneath the immediately useful features, what we would call adaptations and the basis for the design argument, and finding the underlying links, the analogies (homologies) between organisms."[26]

Important here is what Ruse says about classification, about Darwin "*digging beneath the immediately useful features…and finding the underlying links.*" This is, of course, precisely what I stated above in regard to the homologous and the analogous, and it is what Darwin needed to *learn to see* in order to arrive at his ideas of descent from a common ancestor. That Henslow was putting forth Goethe's ideas both in the lectures that Darwin attended at Cambridge and on the long walks the two famously took together while Darwin was a student there from 1828-1831, is an assumption I have good reason to suspect of being true.

From *Memoir of Rev. John Stevens Henslow* (1862)*,* we read that early in his life Henslow was educated by, and had connections to, the celebrated traveller Edward Daniel Clarke (1769-1822), who had early in the 19th century travelled to the continent and who was surely familiar with German science as a professor of Mineralogy. Henslow also had early connections with the celebrated British naturalist William Elford Leach (1791-1836), entomologist James Francis Stephens (1792-1852), botanist George Shaw (1751-1813), and the German-born naturalist Karl Dietrich Eberhard Konig (1774-1851). All these men were very learned and accomplished, and sat near the top of their respective fields at the time.[27]

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[26] Ruse and Richards, *Debating Darwin,* 22.

[27] Leonard Jenyns, John Stevens Henslow, Charles Darwin, and Woodfall and Kinder. *Memoir of the Rev. John Stevens Henslow, M. A., F. L. S., F. G. S., F. C. P. S: Late Rector of Hitcham, and Professor of Botany in the University of Cambridge: by the Rev. Leonard Jenyns, M. A., F. L. S., F. G. S., F. C. P. S.* (London: John van Voorst, Paternoster Row, 1862), Nineteenth Century Collections Online, Chapter 1. http://gdc.galegroup.com.proxy.lib.sfu.ca/gdc/ncco/MonographsDetailsPage/MonographsDetailsWindow?disableHighlighting=false&displayGroupName=DVI-

That they would not have known about and been familiar with Goethe's theory of the Archetype and his subsequent work in morphology and botany, and that these ideas would not have been discussed and debated with Henslow, is unlikely. Goethe was a giant of learning at the time and when he wrote the learned classes of Europe read. And that these Goethean ideas surely would have come up for discussion at some point between Henslow and Darwin as well, given the nature of what they were studying together, seems equally unlikely. Thus, the trail from Goethe to Darwin starts to become a bit more prominent.

Darwin certainly would have engaged with these ideas with his one-time collaborator (and then bitter critic) Richard Owen. Owen is an interesting figure whose fame today rests dually on his efforts in starting the Natural History Museum in London and in his fierce opposition to Darwin's theory of evolution. However, this legacy is a bit unfair, as professionally he made important contributions in the fields of taxonomy and paleontology, and it is Owen who is credited with making the distinction between analogous and homologous structures. Duke University Biology Professor Gregory A. Wray describes Owen's contribution:

> Owen originally proposed the terms *homology* and *analogy* in 1843 with reference to his notion of the archetype, a generalized body organization shared among species within a large group. Owen, who was ostensibly strongly opposed to the idea of evolution, introduced the terms to contrast between two kinds of anatomical similarity among species: homology for corresponding parts of an archetype and analogy for nonhomologous traits with similar function.[28]

Like Henslow, that Owen arrived at these ideas from Goethe's work is not an absolute, but it is well-enough supported to be beyond mere coincidence. Robert J. Richards writes in his 2010 publication *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe*: "Richard Owen, perhaps the most influential biologist

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Monographs&currPage=&dviSelectedPage=1&scanId=&query=&docIndex=&prodId=NCCO&search_within_results=&mode=view&catId=&limiter=&display-query=&displayGroups=&contentModules=&action=e&sortBy=&documentId=GALE%7CBHEHQO082317630&windowstate=normal&activityType=BasicSearch&failOverType=&commentary=&source=Bookmark&u=sfu_z39cpiq&jsid=4d504fbf52635128b67a7643e271decb.

[28] Gregory A. Wray, "Evolution and Development," in *Evolution: The First Four Billion Years,* ed. Michael Ruse and Joseph Travis, 212 (Cambridge, MA: The Belknap Press of Harvard University Press, 2009).

in England during the first half of the century, likewise followed the German lead in constructing his own quite celebrated theory of the archetype."[29] And while Richards continues on to state that in his conception of the archetype Owen followed more closely the examples of the German naturalist Lorenz Oken (1779-1851) and German physiologist Carl Gustav Carus (1789-1869), important here is that not only was Owen aware of these ideas, but that he was following the "German lead," and that Goethe is undeniably the founder of such ideas.[30]

However, if this is not proof enough, according to Richards, Owen's mentor while studying and after university was a British surgeon by the name of Joseph Henry Green (1791-1863). Green studied in Germany and Green "like Schilling and Goethe, both of whom he assiduously read, argued that nature exhibited essential patterns or rational ideas."[31] That Owen would have been mentored by a man who had himself studied in Germany, who closely read Goethe and held Goethean ideals, and that these ideas would not have been imparted to Owen, is impossible to believe. It is likewise impossible to believe that in their early correspondence and work on classification and taxonomy, Darwin would not have discussed these ideas with Owen, knowing now that he had very likely become acquainted with them while at Cambridge.

The homologous is the Archetype. The analogous, by comparison, is that which differs from the Archetype. It is the non-homologous, it is that which changes. Analogy here, as in all cases of analogy, is used as a method of comparison between similar,

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[29] Robert J. Richards, *Science and its Conceptual Foundations Series: The Romantic Conception of Life: Science and Philosophy in the Age of Goethe.* (Chicago: University of Chicago Press, 2010), 528. Proquest ebrary. http://site.ebrary.com.proxy.lib.sfu.ca/lib/sfu/reader.action?docID=10431291

[30] Stephen Jay Gould writes the following regarding Goethe's *Metamorphosis* in *The Structure of Evolutionary Theory:* "In this important work, Goethe applied to plants the same vision that [St. Hilaire, Etienne] Geoffory and Owen would later advance in tying to reduce the great complexity and diversity of animal form (or at least vertebrate) to the single generating pattern of an archetypal vertebra." Stephen Jay Gould, *The Structure of Evolutionary Theory,* (Cambridge, MA: The Belknap Press of Harvard University Press, 2002), 284.

[31] Richards, *The Romantic Conception of Life*, 527; Goethe's Idealism again. The difference here is while Goethe postulated his theory of the Archetype in an Idealistic sense, Carus and Oken were less idealistically motivated. However, this Goethean idealism was inherited by Joseph Green with the notion of nature exhibiting "essential patterns or rational ideas." It appears as if Owen, and then certainly Darwin, stuck to a more materialist conception of the Archetype. Whether idealistic or materialistic, however, the idea remained that there was some reduced, singular entity at the core of plants and animals that needed to be 'discovered.'

though not identical, entities. This is, in fact, precisely what an analogy is: it is a comparison between two *essentially dissimilar entities* for explanation/clarification.[32] The essential is the homologous, the Archetype. The non-essential is the dissimilar, the entities which make the use of analogy necessary: the analogous. The methodological use of analogy in taxonomic classification compares *essentially dissimilar entities* in order to explain or clarify. Homologous traits are directly linked; analogous are adaptive, those which change, those which are not *essentially the same.* Dig down and find the essential, the homologous, and find the common ancestor. This was Darwin's methodological use of analogy.

What links the methodological use of analogy and the second type of analogy used by Darwin, the philosophical, is that this type of analogical methodology and analogical reasoning operates analogously: they are both used to explain phenomena/material when what is encountered is not directly or logically evident. When this is the case, what is needed is the 'leap' of the analogy to bridge the gap of understanding.

What one knows for certain and what one has to *infer* are philosophical topics that garner little attention in everyday discussions, yet they are critically important for how one understands the world around them. To highlight this I focus on the leap that has to be made when one uses analogy, how this separates the inductive from the deductive, or the propositional from the certain, and how this shows that Darwin's theory, at least in this particular sense, may be no more than a philosophical principle.

The correlation between analogous and homologous traits, and the methodological use of analogy and the philosophical use of analogy, is that with the homologous and the deductive a connection exists that assures certainty/continuity, while with the analogous and the inductive there exists a gap that precludes the security and certainty offered by the homologous and the deductive.

[32] Based on an *Oxford English Dictionary* definition used again in Section III below. *Oxford English Dictionary*, online edition. http://www.oed.com.proxy.lib.sfu.ca

In the introduction to the Oxford World Classics edition of William Paley's *Natural Theology* editors Matthew Eddy and David Knight write: "Aristotle's *Posterior Analytics* had stated that it was sometimes impossible to establish a philosophical principle without the introduction of an analogy."[33] I begin with this because here I want to highlight the relationship between inference, analogy, induction, and philosophical principle, and then combine these ideas with Darwin's use of analogy and his theory of evolution by natural selection. We saw above that Darwin relied on inference and analogy, stating "*I should infer by analogy*," (pp. 25) and also that he relied heavily on induction – being influenced as he was by the Consilience of Inductions – and therefore the connection of these ideas to the theory of evolution by natural selection is easy to locate.

Whewell wrote in *The Philosophy of the Inductive Sciences*: "'Induction,' says Aristotle, 'is when by means of one extreme term we infer the other extreme term to be true of the middle term."[34] Thus, in combining these three statements – Eddy and Knight, Darwin, and Whewell – I can deduce that both induction and analogy involve an inference; that whenever one uses analogy or inductive reasoning one is in fact inferring something, and that it is often necessary to use an analogy (inference) to arrive at a philosophical principle. The inference, then, is the 'leap' that has to be made in order to arrive at a conclusion by way of analogy and induction, and none of these three philosophical devices – inference, analogy, and induction – are linked to unambiguous certainty. To use any of them is to take a leap and *presume* that an entity/phenomenon is this way or that way.

Darwin makes use of such analogical inferences by postulating that there are such similarities between two sets of phenomena that he could theorize 'this is what occurs here' (proposition A: Malthus' population principle), and 'what occurs here is *like* what occurs there' (proposition B: competition in nature for food), so consequently, 'I infer by analogy that there are similar mechanisms at work between the two' (proposition C: a process *similar or analogous* to Malthus' population principle is occurring in the natural world). In doing this Darwin wields what Cambridge philosopher Mary Hesse calls a positive analogy, an analogy "by which the model and the natural phenomenon

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[33] Matthew D. Eddy and David Knight, introduction to *Natural Theology,* by William Paley. (Oxford: Oxford University Press, 2006), xviii.

[34] Whewell, *The Philosophy of the Inductive Sciences*, 215.

are assumed to be alike."[35] Therefore, in using ideas such as Malthus' population principle, Darwin inferred that similar processes were operating in the biological realm as were operating in Malthus' principle in order to arrive at an explanation between two *essentially dissimilar entities*, an inference that was indeed central to the formulation of his famous theory.[36]

To presume that separate sets of phenomena are operating according to the same mechanism is to make an inference, and there is no guarantee that an inference will prove to be correct. It may very well turn out to be correct, but initially this truth claim is a supposition used to postulate a theory. As induction is also built upon this type of inference, employing induction or analogy means *inferring* a relationship between two entities. Inferring that some commonality links the phenomena and that phenomena 'B' can be generalized in terms of mechanisms supposed to be operating behind phenomena 'A'. And while this is an effective heuristic for understanding natural phenomena, it is not logical in the strictest sense, nor is it exactly true. It is, again, a method used for explanation and/or clarification to *make sense* of phenomena.

For if something is logical in the strictest sense there is no need to infer anything: it is predictable and clear. However, to stipulate that processes such as those found in Malthus' population principle are operating in the biological realm is to make a comparison between *essentially dissimilar entities* in order to clarify or explain phenomena. This is why Aristotle said that at times it is impossible to establish a philosophical principle without the introduction of an analogy, for it is indeed rare that something is straightforwardly certain. Therefore, analogy, induction, and inference must at times all be used to establish certain philosophical principles. And this is why, when looked at from such a perspective, the theory of evolution by natural section is in fact a philosophical principle.

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[35] Ruse and Richards, *Debating Darwin,* 231.

[36] Darwin's famous words, penned in a letter to a friend: "In October [sic, September 28] 1838, that is, fifteen months after I had begun my systematic inquiry, I happened to read for amusement Malthus on Population, and being well prepared to appreciate the struggle for existence which everywhere goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. Here, then, I had at last got a theory by which to work." Peter Vorzimmer. "Darwin, Malthus, and the Theory of Natural Selection," *Journal of the History of Ideas,* Vol. 30, No. 4. (1969) http://www.jstor.org.

The distinction that enables me to state this is that which separates the logical and the *ana*logical. Indeed, there is an important and non-trivial difference between the two and understanding this difference is important for advancing hypotheses about the natural and the social worlds. The difference is actually very easy to recognize. So easy in fact that all one needs to do is *look* at the words to understand that the analogical must necessarily differentiate from the logical in some meaningful sense as *it is a different word.* They are obviously related to one another, but they become markedly different with the addition of the prefix *ana-*, a prefix that comes from the Greek for 'up' 'back' or 'against.'[37] And once one recognizes this, one sees that one is dealing with very different concepts, for if the two were the same they would not need that troublesome prefix.

The *logical*, as I define and use it here, is that which follows in a necessary fashion as in a piece of deductive reasoning or in an algorithm such as addition. It is not an inference in the sense of *if* P then Q, but simply P then Q. It is logically necessary and certain and is not shackled by that troublesome 'if.' The algorithm of addition, according to this definition, operates logically in that if a person knows and understand the rules of addition, then they know that it is logical and certain that when adding "1" to any number they will get the same result every time: an addition of "1". It is logical in the sense that no matter what the answer has to always be the same. There are no surprises, no second-guessing, and no inferences: simply a straight-forward, *logical* result.

The difference between this and analogy is that when one makes use of analogy one has to make a 'leap' from one idea to another in what must be a *non-logical* manner: for if it were *strictly logical* why would the term *ana*logical exist? Why would a concept like analogy, clearly so closely related to 'logic,' even exist? It exists, I suggest, because hardly anything is strictly *logical*, and the Greeks understood this and reasoned that it is often necessary to reason this way – 'up,' 'back' or 'against' logic – and so they added this prefix to 'logic.' Unlike when doing addition where logically adding "1" to any number *must* result in the number growing larger by "1", in most instances one does not have this same degree of certainty and so one makes use of the *ana*logical. One is 'against' logic in the sense that one is unable to make use of deductive logic and thus one has to

[37] *Oxford English Dictionary*, online edition. http://www.oed.com.proxy.lib.sfu.ca

compensate. This compensation is the inference, and the clue to this is perhaps the seemingly innocuous prefix ana-.

Both in his thought and in the publication of the *Origin*, the methodological and the philosophical were not the only types of analogy important for Darwin. In order to make his long argument he also had to master the rhetorical use of analogy, and this he learned through his intimate reading of William Paley's *Natural Theology*. What I mean by the rhetorical use of analogy is the effective use of analogy when producing a written work so that general readers can understand processes and ideas that, if given in strictly scientific or technical terminology, would be both unpalatable and incomprehensible. It is the ability to effectively and convincingly highlight similarities between disparate elements, not unlike what was described above with Darwin's use of Malthus' population principle. However, whereas Darwin used Malthus' ideas to *create* his argument, he relied on the rhetorical type of analogy in order to *present* his argument.

The rhetorical use of analogy was particularly important for Darwin as his argument, unlike Newton's consilience, was not supported by mathematical demonstration and had to be conveyed strictly by the written word. And as a brief aside, without the capacity to demonstrate on the mathematical level everything Darwin says in the *Origin* is, in reality, nothing more than metaphor: the attempt to articulate biological processes with the written word. Had Darwin chosen interpretative dance as the medium to describe these processes, it would not be dissimilar to what he did with the written word in the *Origin.*[38]

This aside, Paley's book had a considerable impact on Darwin, and this one knows from Darwin himself. Oxford University professor Gillian Beer writes:

> Darwin himself was much affected by his reading of Paley while at Cambridge, and on the very day that his publisher John Murray was selling

[38] "Reciprocally, science makes use of metaphor – the special provenance of literature…'Natural selection' is itself a metaphor that structures the entire theory in unspoken ways…Models in science are in fact metaphors, instruments for understanding a phenomenon by employing more tractable considerations to get at the less tractable…Such metaphors in literature and science operate to acquaint us with aspects of the world hitherto unnoticed. Without the literary device of metaphor, Darwin would not have been able to stake his scientific claim, to make it plausible to his readers and to himself" (Ruse and Richards, *Debating Darwin,* 231).

> the first edition of the *Origin* (22 November 1859) he wrote to John Lubbock: 'I do not think I ever admired a book more than Paley's *Natural Theology:* I could almost formerly have said it by heart.' [And] his close acquaintance with Paley's arguments was crucial to the development of his own quite different theory.[39]

It was crucial indeed, as Darwin followed Paley's example almost exactly when it came time to craft his long argument. To understand how, I jump back to the introduction of the 2006 Oxford World Classics edition of *Natural Theology,* where editors Matthew Eddy and David Knight write: "Paley's book is divided into thematic chapters, consisting of strings of examples to convince the reader that the world was designed. In order to turn these examples into convincing 'proofs', Paley uses metaphors, analogies and appeals to probability."[40]

And what does one find when one turns to the *Origin*? A book organized into thematic chapters, relying on analogy and metaphor to synthesize evidence from diverse disciplines in order to convince readers that the world was *not* designed. Darwin followed Paley's outline and methodology almost precisely in crafting his own, quite contrary argument, an indication that he was influenced by Paley and *Natural Theology* on several levels. For beyond the rhetorical influence, as outlined above, one of Darwin's chief ambitions was to show that nature operated without a designer; that the complexity and diversity of the natural world were natural, materialistic processes and did not need a divine creator.

Darwin's motivation for this stemmed in part from the influence that Paley had on him, as Paley argues in *Natural Theology* for what is today known as the argument from design. In fact, Paley's book is in fact still well-known and read today for its support of the argument from design – well-enough known that Oxford biologist Richard Dawkins thought it necessary to publish a refutation of its main ideas with *The Blind Watchmaker* (1986). The argument from design argues that as there is clear evidence in the complexity of the natural world for the existence of an all-powerful designer God, there must in fact be an all-powerful designer God. Consequently, throughout *Natural*

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[39] Gillian Beer, introduction to *On the Origin of Species,* by Charles Darwin. (Oxford: Oxford University Press, 2008), xxxiii

[40] Eddy and Knight, introduction to *Natural Theology,* xviii.

Theology Paley makes extensive use of both analogy and metaphor, weaving his 'evidence' together in order to prove the existence of a divine creator.

The most famous example of his use of metaphor and analogy, and one which most everyone has likely heard, is the 'Watchmaker Analogy.' Paley argues that if a person finds a watch in a deserted place they *know* that it must have had some sort of designer as it could not have been 'randomly assembled' in nature. In fact, he opens his book with this analogy – a great rhetorical technique in itself – before making his entire argument along the same lines throughout the rest of the book: that as the complexity and wonder of the natural world is so intricate and abundant, as it so obviously could not have been randomly assembled, there must be a designer.

Paley's book is well-written and he was learned on a great number of subjects. *Natural Theology* is not a poorly crafted attempt to prove the existence of a designer God by way of the soapbox, but a well-researched, documented, and organized treatise. Having read it for the first time recently, I admit that it is persuasive. One can only imagine the impact it must have had when it was published to a largely uncritical audience in 1802, an audience that would have overwhelmingly accepted its underlying presuppositions, especially having seen the impact that it had on the young Darwin.

When it came time to write and publish the *Origin,* however, Darwin knew that he was in a much different situation than Paley in that he was attempting to publish a book that the majority of the reading public would likely uncritically *reject.* Knowing this he leaned heavily on Paley and his techniques to put forth his own argument, and that he was able to emulate Paley stylistically is undeniable; for the *Origin,* as is often said, is probably the last truly revolutionary science book that is readable by the general pubic. That he was able to emulate Paley's public reception? This is another matter entirely, one that will be revisited throughout the essay, especially in the Conclusion, and one which is referred to as the '*to-be-heard'* hurdle of the paradigm observer.

Section III –When Theory Feigns Reality

While analogy and the Consilience of Inductions are useful methodological tools, they are double-edged. Too much of a reliance-on or belief-in either can lead to a misapplication of theory and a misunderstanding of the true nature of phenomena. They may even, in the worst case, lead to seeing in the world patterns which are categorically not there. In order to cement the status of his theory through the Consilience of Inductions, Darwin needed to push his theory outwards to account for an even greater diversity of phenomena, and to do this he was forced to make use of analogy to an even greater extent. This last Section asks if Darwin, in explaining phenomena in the human mental and social spheres, pushed his theory out so far that he exceeded its boundaries and came to be speaking metaphorically.

My chief concerns here are with social scientists framing hypotheses about the social world with frameworks from the natural sciences, and on the concomitant desire to reduce a great diversity of phenomena down to a single explanation. Justification for these concerns comes in books such as Richard Dawkins', *The Selfish Gene*, where Dawkins uses a particulate neo-Darwinian notion of evolutionary transmission to postulate the meme and how memes are responsible for the transmission of cultural information; English economist Kenneth E. Boulding's (1910-1993), *Evolutionary Economics,* where Boulding tries to describe an economic system in strict evolutionary terms, in the process using the work 'like' in inverted commas so frequently that it makes one wonder what he is actually saying; and English Associate Professor of Cultural Evolution at the University of Exeter Alex Mesoudi's *Cultural Evolution,* a literalist interpretation of Darwin's theory of variation, competition, and inheritance superimposed on the human cultural sphere in an unabashed attempt to explain human culture in straight Darwinian terms.[41]

[41] Dawkins adds to my continued insistence on the difficultly of almost all things Darwinian and on using models from the natural sciences in the social sciences, writing in *The Blind Watchmaker*: "Once again, the warning with which I began this chapter should be heeded. Cultural 'evolution' is not really evolution at all if we are being fussy and purist about our use of words, but there may be enough in common between them to justify some comparison of principles." Richard Dawkins, *The Blind Watchmaker* (Toronto: Penguin Books, 2006), 216. These ideas are encountered again in Chapter III, Section IV with Anthony Wallace and Interdisciplinary Appropriation.

While these are all interesting and well-informed studies, reading them one cannot help but wonder whether they are an accurate use of Darwin's theory of evolution by natural selection or not.[42] In other words, are these examples of a Consilience of Inductions that should subsequently strengthen Darwin's theory? Or are they simply misplaced analogy and metaphor which result in inaccurate analyses that further stunt one's ability to better understand social, economic, and cultural systems?[43]

With these questions in mind I go back to Darwin and look at specific examples from his later works, chiefly the second edition of the *Origin* (1861), the second edition of *The Descent of Man* (1874), and the third edition of *The Expression of the Emotions in Man and Animals* (1889), to examine how Darwin began to use his theory in increasingly elaborate ways to increase the diversity of phenomena that fell under its explanatory power, be it rightly or wrongly.

Again, I am not arguing that Darwin is right or wrong in certain particulars or that evolution by natural selection as an *explicans* does not belong in this or that realm. In doing research for this Chapter I have learned that the boundaries at which one should draw lines around Darwinian natural selection and thus determine where it 'belongs' and where it is little more than metaphor, loose analogy, or convenient explanation for what we believe to see and experience in the world, is something that at present no one can

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[42] In Chapter III I introduce the *topoi* 'Newtonianism,' and here I introduce Darwinism, another *topoi:* "Darwinism identifies a core set of concepts, principles and methodological maxims that were first articulated and defended by Charles Darwin and which continue to be identified with a certain approach to evolutionary questions." James Lennox, "Darwinism", The Stanford Encyclopedia of Philosophy (Spring 2017 Edition), ed. Edward N. Zalta, https://plato.stanford.edu/archives/spr2017/entries/darwinism

[43] There is also the argument that if human beings are the product of evolution by natural selection then *ipso facto* human constructs such as economic systems must also be the result of natural selection. This is not the argument that these authors, with the possible exception of Boulding, are making, I believe. They are arguing that natural selection is specifically operating within these particular realms, and it is against such reductionism and interdisciplinary appropriate that I am arguing against. To say that because all human beings are the product of evolution and thus human mental attributes, emotions, communities, and hardware stores are the result of evolution as well is the type of blanket statement that does not actually tell one anything; it just gives one a conceptual framework from which to view phenomena (be it rightly or wrongly). It is mistaking levels of analysis and looking at one level as being dominant and fully explanatory at all levels, and an example of the insufficiency of this approach is well established in physics where there are serious problems with the laws and explanations on the cosmological and the particle levels. Kenneth Boulding *Evolutionary Economics.* (Beverly Hills, California: Sage Publications Inc., 1981).

decide positively. The ideas are still too complex, the empirical facts still too lacking, to state these issues definitively.

In almost all aspects of Darwinian evolution there exists a divergence of opinions and beliefs, and the cases of convergence and agreement are but isolated islands in a sea of Darwinian disputation. Confounding matters even more is the fact that while analogy and metaphor are ubiquitous aspects of human life, knowing when one is reasoning analogically or arguing metaphorically requires confronting deep metaphysical questions to which definitive answers may not even exist. Consequently, I offer only an interpretation, not an absolute affirmation regarding Darwin, how one sees the world, and reality.

To present my analysis I begin with a statement of the theory of evolution by natural selection as originally put forth in the *Origin.* I then take definitions from the *Oxford English Dictionary* of isomorphic, analogy, and metaphor, and combine these with excerpts from Darwin's later works to argue that as Darwin pushed his theory outwards, he increasingly moved beyond the original context of his theory and went from speaking isomorphically, then analogically and then, eventually, metaphorically.[44]

I begin with the quote from the *Origin:*

> There is no obvious reason why the principles which have acted so efficiently under domestication should not have acted under nature. In the preservation of favoured individuals and races, during the constantly-recurrent Struggle for Existence, we see the most powerful and ever-acting means of selection. The struggle for existence inevitably follows from the high geometrical ratio of increase which is common to all organic beings. This high rate of increase is proved by calculation, - by the rapid increase of many animals and plants during a succession of peculiar seasons, or when naturalised in a new country. More individuals are born than can possibly survive. A grain in the balance will determine which individual shall live and which shall die, - which variety or species shall increase in number, and which shall decrease, or finally become extinct…The slightest advantage in one being, at any age or during any season, over those with which it comes into competition, or better adaptation in however slight a degree to the surrounding physical conditions, will turn the balance.[45]

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[44] In choosing these definitions there is an element of arbitrariness in that I have chosen from multiple definitions in the OED those which most effectively fit my intended usage.

[45] Darwin, *The Origin,* 344.

What Darwin elucidates here is clearly a theory dealing with phenomena in the biological realm. He is talking specifically about processes and entities in the realm of plants and animals, and explaining how it is that variation and diversity occur in nature through natural selection.

Isomorphic

For the isomorphic I look at Darwin's extension of natural selection to include human beings. This was, of course, famously touched on in the *Origin,* but it was made much more explicit twelve years later with the publication of *The Descent of Man.* In this work, as the name suggests, Darwin incorporates humans into his grand genealogical system, and states that humans, too, are subject to evolution by natural selection and have descended from a common ancestor, as has the rest of the animal kingdom. I call this isomorphic because in placing humans in the appropriate physiological and biological realm, Darwin was, as I show presently, speaking isomorphically.[46]

In Darwin's time the prevailing belief was that God had created each species individually and that man was of a categorically different kind than the rest of the animal kingdom. Darwin's placing humans into the same realm as animals was thus bound to be viewed as sensational in some circles, although Darwin was certainly not the first person to express such views. Today this sensationalism is largely gone and it is widely recognized that human beings are descended from animals, however, Darwin did take a largely unpopular stance in incorporating humans into his theory in this manner.[47]

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[46] This was touched on in footnote 20, as well. Whewell stated that correct theories tended towards simplicity and harmony the more they are verified as true, and those theories which needed additions and further complications to explain phenomena were likely moving in the opposite direction, eventually to be replaced by a simpler theory. Darwin's incorporation of sexual selection in the *Descent* (also discussed in the *Origin*), represents a curious case in regard to Whewell's account as his theory of evolution becomes decidedly more complicated with the incorporation of sexual selection and thus seemingly moves away from Whewell's theory of increasing simplicity and unity with the Consilience of Inductions. These ideas are related to footnote 43, as well, in that perhaps in these diverse realms the power of Darwin's theory falls away and should be replaced by a more adequate theory.

[47] Darwin was essentially the person responsible for changing how human beings viewed the world in this regard, and for this reason he is the *paradigm observer* in regard to human evolution.

What Darwin claimed is that humans and animals are fundamentally the same. That humans are subject to the same biological principles of evolution as the rest of the animal kingdom. As he writes in the *Descent*:

> Even if it be granted that the difference between man and his nearest allies is as great in corporeal structure as some naturalists maintain, and although we must grant that the difference between them is immense in mental power, yet the facts given in the earlier chapters appear to declare, in the plainest manner, that man is descended from some lower form, notwithstanding that connecting links have not hitherto been discovered. Man is liable to numerous, slight, and diversified variations, which are induced by the same general causes, are governed and transmitted in accordance with the same general laws, as in the lower animals. Man has multiplied so rapidly, that he has necessarily been exposed to the struggle for existence, and consequently to natural selection…His body is constructed on the same homological plan as that of other mammals.[48]

Darwin clearly states that human beings descended from a common animal ancestor and are subject both to the struggle for existence and the same mechanism of natural selection as are other animals. Darwin is saying, essentially, that human beings are animals. And when I combine this excerpt, the quote from the *Origin,* and the *Oxford English Dictionary* definition of isomorphic, "*said of groups or other sets corresponding to each other in form, and in the nature and product of their operations,"* my framework begins to take shape: in terms of form and the nature and product of operations, human beings are indeed animals.[49]

For humans, like all other living beings, are open systems that receive energy through the intake of matter and excrete waste products; humans have the same chemical and molecular composition as do other animals; share a common DNA; mate, reproduce and pass genetic material on to their offspring; and according to Darwin the same 'general laws' apply to humans as to animals. Consequently, for all intents and purposes humans and animals are the *same*. On the biological level, humans correspond to animals in form and in the nature and product of their operations, and are

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[48] Charles Darwin, *The Descent of Man and Selection in Relation to Sex: Revised Second Edition*. (Detroit: Gale Research Company, 1974), 142.

[49] *Oxford English Dictionary*, online edition. http://www.oed.com.proxy.lib.sfu.ca

subject to the mechanism of natural selection as are other animals. By pushing his theory out to include human beings, Darwin was speaking isomorphically.

Analogy

Moving to the level of analogy I examine ideas put forth in *The Expression of the Emotions in Man and Animals*. In this work Darwin applied his theory to another set of phenomena in discussing human habits, expressions, emotions, reflexes, and the like, and while what follows may sound critical, the *Expressions* is a wonderful book and shows, I think better than any other, just how innovative a thinker and how careful of a scientist Darwin was. In this work he compiles testimony from various informants and scientists about how different ethnicities act/react in similar situations, and from this correspondence and his own research he postulates that all human beings affect remarkably similar habitual movements, instincts, and the like, such as a seemingly universal reaction to snakes. However, it is when he gets to his explanation of these actions/reactions that I believe he comes to be speaking analogically.

In using the concept of analogy here I again propose that as Darwin is no longer talking about the same *set of phenomena* as when he expounded his theory in the *Origin,* but as he is still attempting to use the same *mechanism* to explain a different set of phenomena, he is speaking analogically. That is, as he is not talking about the same *entities* as he originally was, but as he is still using the same underlying explanation, he is speaking by way of analogy: this *is like* that, in contrast to this *is* this (isomorphic), or this *is* that (metaphor). However, to gain a better grasp of this distinction here first is the *Oxford English Dictionary* definition of analogy: "*A comparison made between one thing and another for the purpose of explanation or clarification*." [50]

Now, that Darwin is speaking of different *entities* while using the same *explicans* – natural selection – can be seen by comparing the excerpt from the *Origin* and an excerpt from the *Expressions*. To make this more noticeable, I reprint below the excerpt from the *Origin* with the following change: I put key terms in **bold** to highlight the entities that Darwin was speaking of, and replicate this in the excerpt from the *Expressions.* This shows that in the *Expressions* the context and the entities referred to are so different that

[50] *Oxford English Dictionary*, online edition. http://www.oed.com.proxy.lib.sfu.ca

Darwin's theory becomes non-transferable in a literal sense. He is now attempting to explain *essentially dissimilar entities* by way of the same mechanism:

> *Origin*: There is no obvious reason why the principles which have acted so efficiently under **domestication** should not have acted under **nature**. In the **preservation** of **favoured individuals** and **races**, during the constantly-recurrent Struggle for Existence, we see the most powerful and ever-acting means of selection. The struggle for existence inevitably follows from the high geometrical ratio of increase which is common to all **organic beings**. This high rate of increase is proved by calculation, - by the rapid increase of many **animals** and **plants** during a succession of **peculiar seasons**, or when naturalised in a new **country**. More **individuals** are **born** than can possibly **survive**. A grain in the balance will determine which **individual** shall live and which shall die, - which **variety** or **species** shall increase in number, and which shall decrease, or finally become extinct.…The slightest advantage in **one being**, at **any age** or during **any season**, over those with which it comes into **competition**, or better **adaptation** in however slight a degree to the surrounding **physical conditions**, will turn the balance.[51]
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> *Expressions*: It further deserves notice that **reflex actions** are in all probability liable to slight variations, as are all corporeal structures and **instincts**; and any variations which were beneficial and of sufficient importance, would tend to be preserved and inherited. Thus **reflex actions**, when once gained for one purpose, might afterwards be modified independently of the **will** or **habit**, so as to serve for some distinct purpose. Such cases would be parallel with those which, as we have every reason to believe, have occurred with many **instincts**; for although some **instincts** have been developed simply through long-continued and inherited **habit**, other highly complex ones have been developed through the preservations of pre-existing **instincts** – that is, through **natural selection**.[52]

Darwin is using the same principle or *explicans* in natural selection to attempt an explanation of phenomena that are *essentially dissimilar*. Put in language of the isomorphic, to be speaking isomorphically is to be speaking about entities that correspond in form and in the nature and product of their operations. Here Darwin attempts to explain how entities of a *different* form correspond in the nature and product of their operations, but he has erred on a crucial point: *the forms are different*. He assumes that because he is talking about humans in the natural world the nature and

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[51] Darwin, *The Origin,* 344.

[52] Charles Darwin, *The Expression of the Emotions in Man and Animals* (Chicago: University of Chicago Press, 1965), 42.

product of operations are the same, survival and reproduction in a competitive environment and liable to natural selection, but he has missed the crucial point in that the forms are different.

For him to answer that the forms are *effectively* the same *because* they have the same product and nature of operations – survival in a competitive environment – is begging the question. It is mistaking the levels of analysis and providing a 'blanket' statement for what may in fact be phenomena in need of a decidedly distinct explanatory scheme. It is a form of circular reasoning that misses the point that while according to such an explanation the forms may be *effectively* the same, they are not *essentially* the same, and to state that they are *effectively* the same because they are subject to the same processes as entities in the biological realm is putting the cart before the horse. It is seeing in the world one's theory instead of seeing in the world what may actually be present.

Human beings, in a strictly biological sense, have the same physical form and the same nature and product of operations as other animals, but this changes significantly when Darwin begins talking about human mental attributes and habits. Human '*reflex actions*,' '*corporeal structures*,' and '*instincts*' are significantly different from '*organic beings'* and '*species*' through which "*a grain in the balance will determine which individual shall live and which shall die.*"[53] So different that they are *essentially dissimilar entities* and to speak of the same mechanism guiding their operation is to speaking analogically. It is to speak out of context and to make a comparison for *explanation or clarification*.[54]

Perhaps Darwin is simply seeing phenomena in the natural world and *believing* it to be explicable by way of his theory of evolution by natural selection, and in attempting to explain human mental attributes, emotions and expressions in such a manner he is

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[53] Darwin, *Origin,* 344.

[54] Darwin, being always such a pensive and careful thinker, was aware of the difficulties inherent in what he was attempting to do. In the introduction to the *Expressions* he writes (in a passage similar to Aristotle's used at the end of the Introduction to this Chapter pp. 14): "It seemed probable that the habit of expressing our feelings by certain movements, though now rendered innate, had been in some manner gradually acquired. But to discover how such habits had been acquired was perplexing in no small degree. The whole subject had to be viewed under a new aspect, and each expression demanded a rational explanation. This belief led me to attempt the present work, however imperfectly it may have been executed" (Darwin, *The Expressions,* 19).

missing the true reality of the phenomena, seeing in different forms and entities in the world the mechanism of natural selection, and consequently seeing what is not there?[55] For such ideas encroach upon the great difficulty that Darwinian evolution has so far failed to overcome: the human mind. One may be able to empirically adduce that there is a universal aversion to snakes, but proving that this is due to evolution and natural selection is immensely difficult.

Metaphor

In postulating natural selection on the social, or tribal level, Darwin applied natural selection to phenomena so far outside the original context of his theory that he came to be speaking metaphorically. Instead of speaking about entities of the same form with the same product and nature of operations (isomorphic), or in making a comparison between entities of a different form but with the same nature and product of operations (analogy), Darwin went beyond these realms and came to be speaking *suggestively* about entities differing both in form and in the nature and product of their operations, seeing in the human social world material phenomena that was solely *representative* of his principle of natural selection.

Conflating matters here is an issue both at the heart of this inquiry and one that is still largely unresolved in evolutionary biology: the levels of selection problem. The difficulty here is understanding on what 'level' natural selection actually 'works'? The individual? The gene? The family? The community? All of these? Some of these some times and others at other times? Difficulty abounds, and British paleontologist and Darwin scholar Gordon Chancellor highlights this in a March 2015 paper "Levels of Selection in Darwin's *Origin of Species*": "Darwinism today seems to have expanded its dominion and has been invoked to explain selection down to the molecular level and up to the species level, but there is still confusion as to what Darwin himself actually said

[55] Of course, this underlying principle, the universal *explicans,* was exactly what Darwin was hoping to find, and what Richard Dawkins also believes to exist and that which Darwin did indeed discover. Writing in the introduction to the Everyman's Library Edition of *The Voyage of the Beagle* and *On the Origin of Species* Dawkins makes it clear that he believes in the universal applicability of Darwin's theory, comparing it to the value of π and the achievements of Einstein and Planck, for example. Richard Dawkins, introduction to *The Voyage of the Beagle and The Origin of Species,* by Charles Darwin (Toronto: Random House, 2003), xxxi.

about levels of selection in *The Origin of Species."*[56] Therefore, inside of this inquiry into metaphor and natural selection on the tribal level are two unresolved issues in evolutionary thinking: where it is that evolution by natural selection actually 'operates,' and what Darwin himself said in the *Origin.*

I refer back to the *Origin* here for two reasons: first*,* to again highlight the contentious nature of many things Darwinian, and, second, because Darwin made an important revision in the last edition of the *Origin* (1872) that deals both with the levels of selection and an intimately connected phenomenon, the problem of social instincts in insects. I say intimately because Darwin had to combine these ideas – levels of selection and social instincts in insects – to postulate natural selection on the human social level by first arriving at an explanation of human moral instincts, an explanation that came by way of the social instincts of insects. Therefore, in order to understand my argument, one has to navigate through the levels of selection, social insects and their instincts, how social insects and their instincts are used to arrive at human moral instincts, and, finally, how all of this is related to natural selection on the human tribal level.

The dilemma in regard to social insects and instincts is why individual members of an insect community are willing to die to ward off intruders, protect the hive, etc., for this type of behaviour flies in the face of Darwin's entire theory in that an individual should not act in direct opposition to its own self-interest by giving up its life, and its ability to procreate, on behalf of other insects.[57] Yet, when observing insects, what one sees is that some are indeed willingly to die for *some reason*. Therefore empirically one has to ask why.[58]

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[56] Gordon Chancellor, "Levels of Selection in Darwin's Origin of Species." Springer International Publishing,(2015),133,http://link.springer.com/article/10.1007/s40656-015-0067-9?sa_campaign=email%2Fevent%2FarticleAuthor%2FonlineFirst

[57] I say ability to procreate here and not 'pass on their genetic material' because Darwin was unaware of what is today known as Mendelian Genetics. Darwin came close to these ideas, and he was indeed informed on heredity, but he did not understand the actual process as worked out by the Czech monk Gregor Mendel (1822-1884)

[58] This is made much more difficult by the fact that humans cannot talk or otherwise communicate with insects. And while this may sound facetious, it is not. Because there is have no form direct communication between insects and humans, one must always rely on a form of behaviourism and, hence, on interpretation. Personally, I hope that if they are doing the same with us, they treat us kindly.

Now, the three key concepts of Darwinian evolution are variation, competition and inheritance. Species and individuals vary in their individual attributes; they compete for scarce resources with other species and with members of their own species; and those who are the most fit in the struggle for existence survive and pass on their (superior) genes to their progeny. There is little dissension with these three pillars of Darwinism, but what is yet to be definitively understood is whether they operate on the level of individuals, on the level of genes, or on the level of communities. If an insect is willing to die for their community (assuming first of all that it *is* for the good of the community), what does this say about the applicable operating level of these core concepts? Where exactly is natural selection 'operating' here? The difficulties with these questions has resulted in an unbelievable amount of research over the years (with the theory of kin selection having made some headway in resolving the problem), but the question as to where natural selection 'operates' largely remains unsolved.

Darwin himself postulated that because of this type of activity there must be some sort of advantage to the community, and the revision in the last edition of the *Origin* reads like this: "in social animals [natural selection] will adapt the structure of each individual for the benefit of the community; if the community profits by the selected change."[59] What Darwin is claiming here is that selection 'works' on the level of the community, implying that not only are actions and changes within the individual affected by natural selection, but that what profits the community in which the individual is a member of can cause an individual to change/adapt through natural selection. That is, natural selection 'operates' at the level of the community.

Therefore, Darwin came to believe that natural selection must 'operate' on the level of the community as empirically one observes altruism and a willingness to die, seemingly on behalf of the community, and this Darwin attributed to an individual's behaviour being adapted so that the community profits. Darwin, in other words, interpreted this to mean that it creates a more 'fit,' or better adapted, community, one that is more likely to endure in a competitive environment, and hence natural selection is operating on the community level by adapting the individual and the individual's

[59] Ruse and Richards, *Debating Darwin,* 143.

behaviour. It is, to put it another way, for the good of the community that the individual insect changes and adapts, and not for the good of the individual insect.

Darwin then took these ideas one step further and postulated that the same mechanisms were at 'work' in human communities, and this is how he explained the origin of human moral instincts. Robert J. Richards comments thus: "when he wrote the *Descent of Man,* Darwin would use the model of the social insects to explain the origin of moral instincts, instincts that worked, not for the benefit of the individual possessing them but for the individuals receiving the benefit."[60] Therefore, the same logic is at work here as with social insects with natural selection acting on the individual but for the benefit of other individuals in the community. What this amounts to is a progression from social instincts in insects and natural selection causing instincts that are beneficial to the community to cause adaptation in individual members of the community, to the moral instincts of human beings and natural selection causing individuals to act in such a way that benefits not the individual in question, but the community as a whole. Thus natural selection 'operates' at the community level in human collectives, as well.

With all of this taken together – the levels of selection, social insects and instincts, human moral instincts, and human communities – Darwin postulates what occurs on the intra-tribal level when tribes meet in combat, and it is here that he comes to be speaking metaphorically. For according to the *Oxford English Dictionary*, metaphor is defined as, "*something regarded as representative or suggestive of something else, esp. as a material emblem of an abstract quality, condition, notion, etc.*"[61] And when one combines this with the following passage from the *Descent*, I believe that the present analysis starts to bear fruit:

> All this implies some degree of sympathy, fidelity, and courage. Such social qualities, the paramount importance of which to the lower animals is disputed by no one, were no doubt acquired by the progenitors of man in a similar manner, namely, through natural selection, aided by inherited habit. When two tribes of primeval man, living in the same country, came into competition, if (other circumstances being equal) the one tribe included a great number of courageous, sympathetic and faithful members, who were always ready to warn each other of danger, to aid and defend each other, this tribe would succeed better and conquer the other. Let it be borne in mind how all-important in the never-ceasing wars of savages, fidelity and

[60] Ibid., 121.

[61] *Oxford English Dictionary*, online edition. http://www.oed.com.proxy.lib.sfu.ca

> courage must be. The advantage which disciplined soldiers have over undisciplined hordes follows chiefly from the confidence which each man feels in his comrades…A tribe rich in the above qualities would spread and be victorious over other tribes.[62]

Darwin claims that due to moral and social instincts that have been acquired through natural selection one tribe is able to conquer another tribe in the *"constantly-recurrent Struggle for Existence*" that Darwin believes to have taken place before 'civilization' like his own arose.[63] Consequently, with the complexities of the levels of selection and social instincts aside, what he is suggesting is that relationships and confrontations between tribal entities are dependent upon the same mechanism of natural selection as that which occurs in the biological realm, and in postulating this he pushes his theory out into the realms of Sociology and Anthropology and, consequently, into metaphor.[64]

For as compared to an isomorphism, which states 'this *is* this,' or analogy, a device used to state 'this *is like* that' in order to explain or clarify, metaphor is used to state '*this is that*' in a representative and/or suggestive manner. Darwin is now speaking metaphorically as what he postulates as taking place on the intra-tribal level in human communities is representative of what he earlier postulated as happening on the biological level.[65] It is representative because both the form and the nature and product

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[62] Darwin, *Descent,* 127.

[63] Darwin did write in the Section "Natural Selection as Affecting Civilised Nations" in the *Descent* that most of his remarks on the matter were taken from the English essayist William Rathborne Greg (1809-1881), the co-discoverer of evolution by natural selection Alfred Russell Wallace (1823-1913), and Darwin's cousin, the English scientist Francis Galton (1822-1911). So perhaps one should not judge him too harshly here (Darwin, *The Descent,* 130).

[64] How much of this postulation of natural selection at the tribal level was due to his time among the Fuegians during the Beagle voyage and his previous knowledge and experience? An experience that deeply affected Darwin and one that had him state, in one of the milder exhortations he makes in regard to this tribe in *The Voyage of the Beagle*: "It was without exception the most curious and interesting spectacle I ever beheld: I could not have believed how wide was the difference between savage and civilized man: it is greater than between a wild and domesticated animal, inasmuch as in man there is a greater power of improvement." Charles Darwin, *The Voyage of the Beagle* (Toronto: Random House, 2003), 217.

[65] If one wished to push the analysis out further one could state, as per Richards and Ruse on science itself being a metaphor (pp. 35), that in doing this Darwin comes to be speaking metaphorically in regards a metaphor. This is actually in line with the *topoistic* perspective in that it attempts to discern and appreciate the different levels of understanding inherent in all matters. Like the onion without the core 'truth' in the middle, the *topoistic* perspective seeks to peel away layers

of operations are *essentially different* and so Darwin is suggesting *this is that*; that what is occurring on the human tribal level *is* that which is occurring on the plant and animal biological level.

for better understanding and appreciate each layer on its own terms. It does not attempt to peel away all the layers to discover a 'Truth' supposedly lying at the center.

Conclusion

This reductionist mentality and the search for universal theory requires more diverse data being subsumed under its explanatory scheme, as the wider the applicability and the more diverse the phenomena a theory explains, the closer it comes to being a universal. But in this search, at what stage does one question whether one is pushing a theory too far? That one is attempting to explain too much with a single theory and that in pushing it out into other realms of phenomena one may be doing little more than the charging down of windmills?

The lure of discovering a universal scientific law is real; very real. And many great minds have sought to extend their theories beyond its initial domain and achieve a Consilience of Inductions, only to be halted in their search by their own faulty hypotheses, presuppositions, and dreams. Having come to see in the world what might not actually be there, seeing instead only what they believed to be there, they fell prey to the very processes outlined here.

As this Chapter has sought to highlight, perhaps even the great Darwin can be included in this category. Having been captivated by the belief that all the complexity and diversity of the biological, human, and social realms could be harmonized under a single explanatory scheme, he began to see his theory in places that it did not necessarily belong, thus falling into the philosophical web Whewell had so elegantly woven:

> The last two sections of this chapter direct our attention to two circumstances, which tend to prove, in a manner which we may term irresistible, the truth of the theories which they characterize: - the Consilience of Inductions from different and separate classes of facts; - and the progressive Simplification of the Theory as it is extended to new cases. These two Characters are, in fact, hardly different; they are exemplified by the same cases. For if these Inductions, collected from one class of facts, supply an unexpected explanation of a new class, which is the case first spoken of, there will be no need for new machinery in the hypothesis to apply it to the newly-contemplated facts; and thus we have a case in which the system does not become more complex when its application is extended to a wider field, which was the character of true theory in its second aspect. The Consiliences of our Inductions give rise to a constant Convergence of our Theory towards Simplicity and Unity.[66]

[66] Whewell, *The Philosophy of the Inductive Sciences*, 238-39.

Chapter II: Achilles and the Achaeans: An Exploration into (mis)Understanding

Two conflicting systems of thought are separated by a logical gap, in the same sense as a problem is separated from the discovery which solves the problem. Formal operations relying on one framework of interpretation cannot demonstrate a proposition to persons who rely on another framework. Its advocates may not even succeed in getting a hearing from these, since they must first teach them a new language, and no one can learn a new language unless he first trusts that it means something.

Michael Polanyi, *Personal Knowledge*

But I did not get my picture of the world by satisfying myself of its correctness; nor do I have it because I am satisfied of its correctness. No: it is the inherited background against which I distinguish between true and false.

Ludwig Wittgenstein, *On Certainty*

Introduction

The Darwin Chapter is meant to give an early sense of how a *topoi* can operate. How one sees the world through distinct and particular frameworks, and how powerful these frameworks can be. This Achilles Chapter will continue to highlight the impact that *topoi* have on people's lives, but it will move in the opposite direction. Instead of highlighting how a person can become immersed in a single *topoi,* in a single way of seeing and experiencing the world, here I present an example from literature of how one's vision of the world can change. How a person can come to step outside their dominant *topoi* and look at the world in a new way, and how this new way of seeing and experiencing the world is connected to the conceptual foundations of *topoi.*

This Chapter also expands on the paradigm observer and the *to-be-heard* hurdle. As I will highlight through Achilles, and as I hope to have just highlighted through Darwin, to be the paradigm observer is to be the individual who comes to see the world differently from her/his peers, and this results from their shifting outside of the dominant *topoi,* the dominant way of seeing and experiencing the world in their given culture. This leads into a discussion of the *to-be-heard* hurdle and the struggles and difficulties that the paradigm observer encounters in attempting to make their new vision understood by those still within the former *topoi.*

Here I explore what it is to act rationally in an irrational world; or, conversely, what it is to act irrationally in a rational world. I draw chiefly from two sources, Homer's *The Iliad* and the English philosopher Peter Winch's (1926-1997) *The Idea of a Social Science and its Relation to Philosophy* (1958). In combining aspects of these works I examine a situation in which members of a community come to opposing conceptions of reality as one member rejects the foundational concepts of their society, and how this results in their inability to communicate with one another.[67]

[67] The terms 'society,' 'collective,' and 'community' are used somewhat synonymously throughout this Chapter, though they are distinct from other larger *topoi,* such as a nation-state and what I call the 'over-arching cultural *topoi.* The distinction goes, roughly, in terms of size – over-arching cultural, nation-state, society, community, collective – but these are all discrete levels of analysis to a certain degree and require their own methods and analysis for a more complete understanding.

Section I begins by describing how societies and human collectives are built upon certain foundational concepts. Section II turns to *The Iliad* to highlight how Achilles comes to step outside the dominant *topoi* of his warrior society. Section III shows how societal relations, like human languages, are structured upon rules that are built upon the collective's foundational concepts and how a rupture in these rules results in the inability to effectively communicate. Each Section is built upon a specific quote from Winch's book and develops the ideas presented in each by examining Achilles and the Achaeans.

To demonstrate how words and actions come to be viewed as 'irrational' I introduce the realm of intelligibility. This tripartite classification delineates how words and actions come to be classified as either 'correct,' 'incorrect but correctable,' or 'irrational,' and this is intimately connected to how *topoi* structure, mediate and organize people's lives. The connection is between how *topoi* operate with rules, norms, and standards of behaviour that function to make a person's words and actions understandable to others within the *topoi.* In developing the realm of intelligibility through Achilles, I offer an example of how these levels operate in regard to understanding and explanation and how a person can move beyond the realms of understanding and explanation and into the 'irrational.'

The Chapter seeks to emphasize how a *topoi* functions as a collective way of seeing and experiencing the world by showing that meaning and understanding come through shared *topoi.* That communal understanding is premised upon the common acceptance and collective agreement of the rules, norms, and standards of behaviour that are derived from a collective's foundational concepts, and that to step outside of these rules and beyond the conceptual foundations of one's *topoi* is to act not only incomprehensibly, it is to act 'irrationally.'

Section I – The Conceptual Foundations of Human Collectives

Human collectives are built around certain foundational concepts. In fact, to make this statement even stronger, I will state that all human collectives must have some sort of overarching *thing* in which members subscribe in order for a collective to emerge.[68] As the French satirist and Enlightenment scribe Voltaire (1694-1778) famously quipped, even bands of thieves have agreements and rules which permeate their collective and govern the behaviour of those within, and these agreements and rules are based on certain concepts. For example, the principle never to 'snitch' is based on concepts such as loyalty, camaraderie, and integrity, and this conceptual basis is structurally evident in all human collectives.[69]

These concepts are then used as the foundations for the society's institutions, and the rules, norms, and standards of behaviour of the society stem from these institutions. It is due to this structure that the words and actions of a individual within a collective are then able to be interpreted and judged by others, and these are what structure, mediate, and organize group life.[70] Consequently, I am suggesting an identifiable link between the central concepts adopted/promoted by human societies, the societies' institutions, and the rules, norms, and standard of behaviour by which people

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[68] A line of clothing often seen worn on the streets of Vancouver today is the 'Anti-social Social Club.' This brand's name can be used to highlight my argument. In order for an anti-social social club to exist, people must come together by first accepting the two foundational concepts such a collective is clearly premised upon: Social clubs, and a social club being anti-social. One would not join a social club if one did not subscribe to the concept of social clubs, and one would not join an anti-social social club if one did not subscribe to the concept of a social club being anti-social.

[69] And expanding this up to include larger *topoi* such as nation states: "Complex societies are focused on a center, which may not be located physically where it is literally implied, but which is the symbolic source of the framework of society. It is not only the location of legal and governmental institutions, but is the source of order, and the symbol of moral authority and social continuity. The center partakes of the nature of the sacred. In this sense, every complex society has an official religion." Joseph Tainter, *The Collapse of Complex Societies,* (Cambridge: Cambridge University Press, 1988), 27.

[70] Institutions generally emerge with societies, nation-states, and overarching cultural *topoi,* and my argument is not meant to be universal in the sense that all human collectives have institutions. Bands of thieves are not large enough and/or structured enough to have or need institutions (unless you include large mafia, perhaps), though they certainly do have norms and standards of behaviour based on central concepts.

in the society are meant to act in accordance with. However, to make this more palatable, I begin with two examples.

When one opens a copy of the *Holy Qur'an* the first words found are well-known to every Muslim:

> *In the Name of Allah,*
> *the Compassionate, the Merciful,*
> *Praise be to Allah, Lord of the Universe,*
> *and Peace and Prayers be upon*
> *His Final Prophet and Messenger.*[71]

I say well-known but this is an understatement. This short verse is spoken by Muslims at various times of the day; often before prayer, before going to bed, and before reading from the *Holy Qur'an,* and it is also said out loud before communal prayer by a Mullah or Imam. Therefore, this verse is inevitably known by all Muslim believers and within it are embedded the central concepts from which the entirety of the faith extends: Allah, the Prophet Muhammad, and the *Holy Qur'an*.

As most people are aware, Allah is the supreme and only deity of this strictly monotheistic faith; the Prophet Muhammad is the messenger of Allah and the final in a long list of prophets dating back to Ancient Israel (also known as the 'Seal' of the Prophets in the *Holy Qur'an*); and the *Holy Qur'an* is the final revelation given to the Prophet Muhammad from Allah, a text known to many Muslims simply as 'The Miracle.' Consequently, these three concepts are necessarily known and subscribed to by every Muslim, no matter the denomination of Islam, and those who are a part of the Islamic community, the *umma,* must accept the authority and veracity of all three, as without any of them there can be no Islam as it is known today.

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[71] Yusuf Ali, Abdullah, ed. *The Holy Qur'an: Text, Translation, and Commentary: New Revised Edition* (Brentwood, Maryland: Amana Corporation, 1989).

Further, when one looks into Islamic life and Islamic societies, one sees that the institutions erected to guide and support the lives of those in the *umma* are built upon and derived from these three concepts. Institutions such as the mosque, Islamic education centres, and Islamic banks, are all based upon ideas and texts such as the *Hadith,* the *Sunnah,* and the Five Pillars of Islam, and these are all derivatives of the three central concepts of the faith. The *Hadith* and the *Sunnah* are documents related to the sayings, teachings, and actions of the Prophet Muhammad, and The Five Pillars come from the *Hadith.* As all of these are themselves premised on a belief in Allah, one sees a direct continuum from Allah, the Prophet Muhammad, and the *Holy Qur'an* to the institutions that structure, mediate and organize the lives of Muslims.

These institutions do this by creating the rules, norms, and standards of behaviour that dictate the lives of the faith's adherents. For example, going to mosque five times a day to pray, abiding by dietary restrictions, and refraining from certain activities judged to be undignified are all used as guides and norms for how people are to act. These determine what behaviour is acceptable and what is unacceptable, i.e. how one should speak and act and how one should not speak and act, and this is the manner in which all *topoi* function.[72] People who act outside of these norms and rules are generally censured and thus do these institutions and the central concepts of the faith structure, mediate, and organize the lives of people in Islamic communities. And anyone who has ever had the pleasure of visiting and spending time in a Muslim community knows very distinctly how much of an impact these institutions and the rules and standards that stem from them do indeed have on the daily lives of Muslims.[73]

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[72] As outlined in the General Introduction, *topoi* structure both mental and physical places in one's life and give one meaning through these commonplaces. The institutions of Islam, as an example of this, structure the lives of its believers through such commonplaces: the places where Muslims meet to find meaning and direction in their lives.

[73] This is a quick gloss over a complex and sophisticated way of life, but it is only meant as a brief example of how societal norms and the standards of behavior that direct the lives of those in a given community come from the foundational concepts the community has adopted. It would be remiss to insinuate that Islam is completely monolithic and that there is a strict uniformity across all Islamic communities, as there certainly is a rich diversity in regard to the varying norms and standards that individual Islamic communities adopt. However, there are also general norms and standards that can be observed in all Muslim communities (this is what makes them Muslim communities) and these are built upon the three central concepts outlined above.

A theocratic community is generally one of the easiest examples for making an argument about the conceptual foundations of a society, as the concepts that structure such a society – God – are made both obvious and explicit, and the enforcement and observance of rules is maintained to such a level that they become quite prominent.[74] For observers from the West, those who live in such different cultures and such different societies, recognizing the modalities of Islam as compared to their own society is easier because, at least superficially, Islamic societies appear so different. Additionally, turning inward and looking at a Western society for a Western person, like turning inward and recognizing one's own idiosyncrasies, is much more difficult than looking outward and looking at someone else's. One tends to be able to *see* other societies and how they are structured more easily than one is able to *see* one's own.

I say that Islamic societies are 'superficially' different than Western societies, and they are superficially different in this sense: everything I wrote regarding foundational concepts and institutions structuring the rules, norms, and standards of behaviour for individuals in an Islamic community applies to how Western societies are structured as well. This is due to the nature of all human collectives as these collectives and cultures are, of course, *topoi.* For in both of these examples people come together under a set of core concepts, and as the *topoi* grows larger and gains a wider influence it permeates not only how those living within the *topoi* interact on a day-to-day basis, it also begins to permeate how individuals within the *topoi see the world.* In fact, as I highlight below, it actually *becomes* the world for them.

To think that one's decision to vote or not vote, to go to the pub on the weekend, to attend a religious institution or a yoga studio, or on what clothes to wear while dining out, is different from decisions made by those living in Islamic communities, is to misunderstand the *topoistic* structure of human societies. aAll these decisions are made possible in the first place by the conceptual and institutional structures erected within the particular place. That decisions and activities in the West are different from those that people make in an Islamic society is not because those in the West are fundamentally

[74] Both internal and external enforcement. If one believes God can see all that one does, knows all of one's actions, and that one will be judged accordingly for such actions one day, one will likely act differently than if one does not believe this. Laws and punishments of the judicial nature are, likewise, more noticeable in such a society, as there is more external enforcement of acts which occur in other societies on a daily basis.

different from Muslims (or vice versa) but because each society is built around different conceptual foundations and people in each consequently see and experience the world differently as a result of this. Western communities and societies are different *institutionally* and *organizationally,* certainly, but that they share the same structural underpinning is immediately recognizable once one looks from a *topoistic* perspective.

What I want to argue is that secular societies, theocratic societies, and even much smaller collectives such as the Ku Klux Klan (KKK) and the Anti-Social social club are all structured the same way. They are all *topoi:* all ways of structuring, organizing, and mediating a person's experience of the world through frameworks based upon particular foundational concepts which bind the collective together. Understanding this span of *topoi* from the over-arching cultural, to large *topoi* such as a modern nation state, to small *topoi* like the Ku Klux Klan and the Anti-Social social club, is key both for seeing and understanding the world from the *topoistic* perspective, and in understanding the immeasurable *topoistic* complexity of our modern world today.

The overarching cultural *topoi* is the one in which all people are brought up, whereas the smaller variety are those in which people actively join, presumably because they subscribe to the central concepts of this *topoi*. That is, within most of the smaller *topoi* people come to see and experience the world through, there is a choice involved in that people tend only to become members of the smaller *topoi* in which they subscribe to the central concepts. In collectives like the KKK, for example, people who are not white supremacists generally will not find themselves a part of such an organization. This is because in order to become a member of such a *topoi* there has to be a social or conceptual incentive which brings a person to this *common*place. And for those who do not subscribe to or sympathize with the foundational concepts of the KKK (racism, inequality, hate), it is unlikely that they will find themselves participating in such a *topoi*.

Contrast this with the over-arching cultural *topoi,* where no such choice is made. Humans are simply born into this world and into a particular culture and all people are thus brought-up and indoctrinated in a specific way of seeing the world. This is the type of *topoi* I describe below with the Achaeans and the type in which people are mostly unaware of the extent in which this *topoi* structures, mediates, and organizes how they see and experience the world: they simply grow up in this world and accept it as the *way the world is*.

Somewhere in between these two are *topoi* such as the modern nation state, *topoi* which also present a slightly different set of circumstances. While nation states and other complex societies certainly have a center that binds people in the society, these large *topoi* are different in a few regards. For example, while all humans are born into overarching cultural *topoi,* and while one actively joins the smaller *topoi,* these middle *topoi* are somewhere in between this. It is not exactly as simple as it was in Plato's or John Locke's time where if one did not subscribe to the *ethos* of their society one could walk out of town and never come back, although there are ways that individuals can actively chose to leave a particular nation-state and live in another nation-state today.[75]

Further, these *topoi* are so large, so rationalized, and so dominant today that individuals who have legitimate concerns but who are unable to 'walk out of town' have to learn to cope and deal with their concerns in different ways, one of which is joining smaller *topoi* and learning to find community and meaning there.[76] This over-lapping and superimposing of *topoi* upon *topoi* is again one of the most characteristic aspects of modern societies today, and coming first to grips with, and then understanding this, will be no small task for social scientists of the future.

Societal *topoi* in the secular West, just as in an Islamic nation, also direct the conduct of the individuals who comprise the society and of the collectivity as a whole through foundational concepts, institutions, and rules, norms, and standards of behaviour. As I looked at Islam as an example of a theocratic society, I want now to examine a comparatively different society, in this case the United States of America, beginning with one of its foundational documents, the *Declaration of Independence*:[77]

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[75] For example, we see nations today accepting refugees for legitimate reasons such as their vulnerability to sexual and gender discrimination. Therefore, those who were once confined and restricted are now able to, through the right legal channels, 'walk out' of their home nations.

[76] Another way is through charismatic individuals who reject the overarching *topoi* of their society and demand to step outside and make significant changes to the status quo: Mahatma Gandhi and Nelson Mandela being two prominent examples from the twentieth century. These ideas are developed in more detail in Chapter III, Section V with Anthony Wallace and his revitalization movements.

[77] The *Declaration of Independence* includes the word 'Creator' in the first sentence. However, the *First Amendment* and, specifically the *Establishment Clause,* make clear that there is no state

> We hold these truths to be self evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness. That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, That whenever any Form of Government becomes destructive of these ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their Safety and Happiness.[78]

One can easily locate the concepts central to the creation of this society in this famous passage: '*self-evident truths*,' '*equality*,' '*unalienable rights*,' '*liberty*,' '*pursuit of happiness*,' '*just powers*,' '*right of the people*,' '*government*,' '*safety*,' '*happiness*.' That these concepts still form the bedrock of American society need not be debated here. Lacking is perhaps the famous "life, liberty, and the pursuit of happiness," but I trust the reader recognizes what I am attempting to highlight. The United States of America, as is every *topoi,* is built upon particular conceptual foundations, and these are likewise located within its foundational documents, as is the case with Islam.

The author of the *Declaration* also endorses my argument regarding a society's institutions being structured around its central concepts when he writes that this particular society is to "*[lay] its foundations on such principles and [organize] its powers in such form as to them shall seem most likely to effect their Safety and Happiness*." In other words, the concepts highlighted above, and those found throughout the above excerpt, (principles) are to be the *structural* foundations of the society. The society is then to *organize* itself by building such an architecture (read: creating institutions) as to *direct* it toward the over-arching goal of Safety and Happiness.

Therefore, if a society aspires to freedom it will chose such a concept as the foundation of its society (*structure*). To obtain this goal, it will then create institutions, rules, norms and standards of behaviour (*meditate*) that influence members of the society to act in such a way (*direct*) so that the society may attain what is expressed in the foundational concept. If, alternatively, a society wishes to take an adherence to God

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religion and there is a separation between Church and State, thus my use of this example as secular.

[78] Thomas Jefferson, *The unanimous Declaration of the thirteen united States of America,* "National Archives", https://www.archives.gov/founding-docs/declaration-transcript

and his [sic] dictates as the foundation of its society, then it will follow the same process of structuring, mediating, and organizing itself in order to attain such an objective.

And all of this makes perfect sense. For the only manner in which a collective can achieve what it has set out to achieve, and its foundational concepts are really the diluted-into-single-word-form of what a collective wishes to *achieve*, *look-like*, *be*, is to structure the society with such principles and rule-based standards of behavior that orientate the actions of the members of the society and directs them towards the accomplishment/attainment of said concepts. Again, if a collective envisions and desires a society of justness, then they set as one of their foundational concepts justice; if a collective wishes for piousness, then piety. Having set these as the foundations of their collective, they then arrange their mediating institutions so as to direct people's norms and standards of behavior toward the attainment of these concepts.

Evidence is found for such an analysis simply by comparing an Islamic society with the United States of America today, for one sees vastly different societies, with specific institutions erected around certain concepts, which then regulate the conduct of its inhabitants through rules, norms, and standards of behavior – an underlying architecture that inevitably results *in specific types of behavior* in both places. For example, in some Islamic communities a person is often told, or at the very least expected, to worship in a certain way; in the United States of America a person is told that one cannot be told how or if one is to worship, one is free to choose as one likes. Communities/societies being of such a *topoistic* nature how a society is structured inevitably breeds distinct norms and behaviors and when one looks at these different societies today one can see this quite clearly: one has a proliferation of faiths and non-faiths, the other a strict unanimity of faith. Because both of these *topoi* chose specific concepts to serve as their central foundations (*structure*), this resulted in the erection of particular mediating institutions (*mediate*), which resulted in standards and rules of behavior aimed at the attainment of these concepts (*organize*), and this largely led to the societies/communities that they have today.[79]

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[79] Large societies are more complicated than this, of course, and I do not believe that a society can simply choose their central goals and automatically achieve them. Social systems are large, self-organizing systems and often respond paradoxically, the Law of Unintended Consequences never being far away. However, my analysis is not entirely wrong, either. The Third Reich, Pol Pot's regime in Cambodia, and the United States of America, all outlined specific concepts as the

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Peter Winch in *The Idea of a Social Science and its Relation to Philosophy* affirms what these concepts really mean to people in their conception of the world:

> The concepts we have settle for us the form of the experience we have of the world. It may be worth reminding ourselves of the truism that when we speak of the world we are speaking of what we in fact mean by the expression 'the world': there is no way of getting outside the concepts in terms of which we think of the world…The world is for us what is presented through those concepts. That is not to say that our concepts may not change; but when they do, that means that our concept of the world has changed too.[80]

What this quote from Winch teaches is that whenever one speaks of the 'the world' one is in fact speaking of the indescribable reality that surrounds one and this, when diluted down to the expression 'the world,' is done through concepts. In other words, there is no way for one to speak of 'the world' other than conceptually, as this 'world' is in fact one's daily-lived reality made comprehensible through the concepts each human holds primary to their understanding of 'the world.' Whatever a person sees and articulates in the world, they see and articulate through the concepts that are at the center of their worldview – that which is 'the world' to them – and this is due to the fact that the concepts people hold primary to themselves function to narrow down the incomprehensible reality that is swirling around them. And by doing this these concepts make 'the world' comprehensible. This is the reason for the discussion of the conceptual foundations of Islam and the United States of America above: each society sees the world through the concepts that their society has selected as important, and this is how members of this society *see and experience the world;* something that is made abundantly clear if one just takes the time and speaks and listens to how a member of each of these separate societies speaks of 'the world.'

By diluting into single words and concepts this inexplicable reality, by 'selecting' what to concentrate on in 'the world,' humans anchor their place in the world and are

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foundations of their societies and then very purposively and deliberately attempted to achieve these, all three succeeding, for a time…

[80] Peter Winch, *The Idea of a Social Science and its Relation to Philosophy* (London: Routledge, 1990), 15.

then able to ‘go out into’ the world and make sense of it. These concepts operating, to put it another way, as a sort of Kantian bedrock by which all else is then able to make sense. The guiding concepts that a community enshrines, then, become the lens through which people brought up in this community come to believe what is important, and these concepts, once shared amongst members of a community, become the world *itself* for these individuals. For as Winch states, “*there is no way of getting outside the concepts in terms of which we think of the world*.”

Consequently, a Muslim sees and experiences the world – and forgive what is going to sound like a crude tautology – *through the eyes and with the mind of a Muslim person,* just as a citizen of the United States of America sees and experiences the world through the eyes and with the mind of a citizen of the United States of America. And while it may sound strange to state it like this, this central aspect of the *topoistic* perspective – how one sees the world matters – can become even stranger: human beings come to see and experience the world through the *topoi that they see and experience the world through.* That is, the specific *topoi* that every human being sees the world through *naturally determines* how they then see the world.

The imaginary manner in which a single individual, brought up within a single community, sees and experiences the world according to the dictates of her/his *topoi* can make this easier to understand. If an individual grew up in a single place and only ever knew this place, having no contact whatsoever with other communities and cultures, this individual would necessarily believe that what happened in their community was normal in the sense that *this is the way the world is,* i.e. *that this is the one true reality*. If this individual was then introduced to another culture, to another community that structures, mediates, and organizes its experience of the world around different concepts, the individual would be unable to understand how this community understands reality, as they would be unable to see ‘the world’ in the same manner that this other community sees the world.

Initially, then, this individual would not be able to understand this different social reality as they would actually be unable to understand that social realities outside of their own even existed. And while this, too, may sound strange, it is fundamental to how one sees the world through specific *topoi* and is itself related to how one comes to see that which is hidden. Because of the very nature of *topoi* – because *topoi* are built upon

certain concepts that are structured with rules, norms and behaviours that interpret words and actions as 'correct,' 'incorrect,' or irrational,' this making each *topoi* unique like a monad – this individual, having only ever grown up in one place and having no contact with the outside world, knowing only her/his own particular *topoi,* would necessarily be unable to see the *topoistic* nature of reality. That is, they would be unable to see beyond their own *topoi* and recognize that other *topoi* exist as their *topoi* is all that they know to exist, and thus for them to be able to see and understand another conception of reality, if all they know is their own conception of reality, is an impossibility. For to see the *topoistic* reality of the world, to see that other *topoi* beyond one's own exist, is to first understand that other modes of conceptual organization (*topoi*) exist, and if a person only ever knew and experienced their own *topoi* they would necessarily be unable to see and understand this *topoistic* reality, as humans are fundamentally unable to *know* that which what they do even *know* to exist.

The idea here is that the primary cultural *topoi* is not only the bench-mark by which humans comprehend 'the world,' it is also the primary lens through which a person views 'the world.' As Winch puts it, "*the concepts we have settle for us the form of the experience we have of the world…[and] the world is for us what is presented through those concepts*." Consequently, the person who only sees and understands 'the world' through a single *topoi* is necessarily only able to see and understand the world by way of this single *topoi,* and 'the world' to them is simply what is presented to them through this *topoi.*

Today we must understand that not only are there many distinct *topoi* that structure how individuals see and experience the world, but also that these are largely incommensurable modes of conceptual organization which present unique conceptions of reality. This multiplicity and plurality of *topoi* is central to the second feature of the *topoisitic* perspective, and it is something that needs to be more widely acknowledged and understood in order to find a new way of looking at the world today.

Section II – Beyond *Kleos* and *Time*

I now turn to *The Iliad* and examine how Achilles came to reject foundational concepts of his Greek warrior society, and how this resulted in his split with the rest of the Greeks warriors. My use of textual evidence from *The Iliad* and the overall argument of this Section is again guided by a quote from Winch's *The Idea of a Social Science and its Relation to Philosophy*: "A man's [sic] social relations with his fellows are permeated with his ideas about reality. Indeed, 'permeated' is hardly a strong enough word: *social relations are expressions of ideas about reality*"[81] (emphasis added). My interpretation of *The Iliad* builds on this as well as on Section I by examining how the Greek warriors' social relations with Achilles are rent after Achilles comes to a new conception of reality by rejecting the foundational concepts of their collective. For when a person's conceptual foundations (*topoi*) change, their world changes; and when their world changes, their reality changes; and as social relations are expressions of ideas about reality, when a single member of a collective steps outside the dominant *topoi* they enter a new conception of reality and thus inevitably rent the social relations they once shared with their peers.

The Iliad is set in the tenth year of the Trojan War and is centered on the rage of Achilles, the great Greek warrior who withdraws from fighting after he has been stripped of his prize Briseis by the leader and King of the Achaean (Greek) forces, Agamemnon. The clash between the two and Achilles' withdrawal results in the deaths of many Greek warriors as well as the Trojans gaining a considerable advantage over the Greek forces as Achilles implores his goddess mother Thetis to convince Zeus to give the Trojans the advantage, so that the Achaeans will come to see how badly they need Achilles, and how wrong Agamemnon had been to strip him of his prize.

Agamemnon eventually sends an embassy to Achilles laden with gifts imploring him to return to the battle, but this is refused; it is only when Achilles' most loved companion Patrolcus is killed by the greatest Trojan warrior, Hector, that Achilles re-enters the war, a war in which the Greeks are eventually triumphant. Upon Achilles

[81] Winch, *The Idea of a Social Science*, 23.

entering the battle again readers witness both his demonic rage and his status as the greatest Greek warrior, as he kills countless men, battles with a river, and holds spectacular funeral games after killing Hector and laying Patrolcus' body to rest. *The Iliad* concludes, however, with Achilles coming to recognize and understand his own humanity through a visit from Hector's father Priam, the King of Troy, who comes to Achilles camp to implore him to return Hector's body so that it may be properly buried by the Trojans, the event which closes the epic.

Unsurprisingly, Achilles is mostly remembered today as a sulking bruiser who acted with uncontrollable rage. However, by employing Winch's ideas and analysis one may arrive at a slightly different understanding of Achilles and his actions. By deepening one's perspective and using clues from the text, one discovers that it was due to Agamemnon's behaviour and its social ramifications that Achilles came to realize that what the Greeks were fighting for in Troy, and indeed the very foundations of their warrior society, had become meaningless. By looking at Achilles and *The Iliad* from this perspective, one enriches their understanding both of Homer's epic and of Achilles, and the reader is able to see an example of how to move past a reductionist reading of a text – Achilles' rage – and on to a newer, deeper level of understanding.

Achilles first realizes the emptiness of his warrior society after Agamemnon strips him of his concubine Briseis in Book I. This realization then comes to his full rejection of this society when the embassy – Odysseus, Phoenix, and Ajax – attempts to induce Achilles to re-join the fighting in Book IX. This rejection of Achilles' and his realization of how Agamemnon has rendered this society meaningless is central to understanding Achilles' and his actions.[82] For it is due to Agamemnon's actions that Achilles came to view his warrior society from such a perspective that he was unable to understand why anyone would live such a life any longer. What had once seemed so natural to him in

[82] I want to argue that Achilles' actions cannot be categorized/explained solely as rage and/or passion, although these certainly were central to his behaviour. Achilles is a complex figure and any attempt at a definitive explanation of him and his behaviour is not laudable, but laughable. Achilles acted with rage, several times over, this is clear. What I argue is that this is not the whole story; that there is something deeper going on with Achilles and I use this argument to argue that there is *always* something deeper going on. This deepening of our perspective is an integral aspect of the *topoistic* perspective and is directly opposed to the reductionist perspective such as was highlighted in Chapter I.

fighting and battling for glory and honour, had now come to seem irrational; irrational enough that he decides it would be better to sail home to Greece than to stay any longer at Troy. What I will show from this perspective is that Achilles' words and actions are actually both logical and justifiable, not simply the acts of a man in the depths of a passion-induced madness, and that it was actually due to his rejection of the two foundational concepts of *kleos* and *time* (glory and honor) that made him speak and act the way that he did.

The Greeks of Homeric epic were motivated by the concepts of *kleos* and *time*, concepts grounded in the mythical and highly theistic world of the ancient Greeks, and which permeate *The Iliad.* Briefly, glory (*kleos*) is won through one's deeds on the battlefield and from performing such deeds over a period of time comes honor (*time*). The two are intimately connected in that honor comes with/from glory and both must be earned through years of hard battle. Related to *kleos* and *time,* a primary objective in this society is to win immortal fame and glory through one's actions, and it is for these three concepts that Achilles has fought his entire life, his drive to achieve this immortal fame resulting in his becoming the greatest Greek warrior. Crucially, it is *kleos* and *time* which Agamemnon renders meaningless when he takes Briseis in Book I, and then when he sends the embassy to Achilles' ships in Book IX to lure Achilles back into the battle with great gifts and wealth.

After the loss of Briseis and his confrontation with Agamemnon in Book I, Achilles swears he will no longer fight and this event, central to my interpretation, is also one of the sources of Achilles' famous rage. However, while Achilles later admits that he was indeed acting with rage during his confrontation with Agamemnon, he also recognizes that Agamemnon was acting even worse than he, an importance piece of evidence for my argument. In Book IX, having been out of the fighting for some time, Achilles proclaims: "He cheated me, did me damage, wrong! But never again,/ he'll never rob me blind with his twisting words again!/ Once is enough for him. Die and be damned for all I care!/ Zeus who rules the world has ripped his wits away."[83]

This highlights two important ideas: first, that long after he has been out of the fighting Achilles is still in a rage, and second, that Achilles believes Agamemnon to have

[83] Homer, trans., Robert Fagles and Bernard Knox. *The Iliad* (New York, NY: Penguin Books, 2001), 264.

acted senselessly, to have acted without his wits. This shows that not only is Achilles still mad, but also that he is questioning the man at the head of this warrior society, questioning whether with such a man in charge, acting the way he has acted, whether both he and the values embedded within this collective are still worth living and dying for. For Achilles' words are clear enough here, and he is adamant that this type of thing will never happen again, something which could be telling readers a lot about what Achilles is feeling.

For in this same passage Achilles has very choice words about Agamemnon and how when at war Agamemnon always sat back and lived off the fighting of others, and also about the hardships and difficulties that he, Achilles, has been through and how he always gave the greatest bounty to Agamemnon when they conquered a city. Could it be that this initial act of Agamemnon's has Achilles seriously thinking about the life he is living in this particular society? About living his life in a society based on the concepts of glory and honor and what it means to live one's life for these concepts?

Perhaps. But I want to suggest that Agamemnon's whimsical and retributive behaviour is not the most crucial aspect of Achilles subjecting the foundational concepts of his warrior culture to reflective inquiry. He and his personal disagreement with Agamemnon in Book I aside, Achilles' probing goes beyond Agamemnon the man and to the deeper importance of what his actions *really mean* for the society as a whole. For what Agamemnon has done is intervene in a domain that cannot be interfered with by a single person, king or otherwise. By interfering with the sacrosanct societal concepts of glory and honor he has in fact gone beyond what is permissible by a single individual and punctured the very fabric of the society itself.

These are concepts which have to be earned through years of hard battle and sacrifice, and *which have to be recognized collectively*; exalted and given meaning through the common agreement of members of the society, as it is through the concepts' collective reification that they are able to bind the collective together. Not only did Agamemnon's actions strike an individual nerve with Achilles, but they actually transgressed the foundational concepts of the entire collective, and this is what resulted in Achilles coming to question his living in such a society.

For Agamemnon alone did not bestow upon Achilles the title of greatest warrior and give him his great glory and honour. Achilles had fought all his life to attain these and they were embedded within the social reality of his society. As such they could not be meddled with by a single person, especially, it would seem, in a theistic society such as this one where these concepts were also associated with the Gods of Olympus. And yet this is precisely what Agamemnon does in Book I, and Achilles almost immediately realizes it, exclaiming to his goddess mother, Thetis: "Mother! / You gave me life, short as that will be, / so at least Olympian Zeus, thundering up on high, / should give me honor – but now he gives me nothing. Atreus' son Agamemnon, for all his far-flung kingdoms - / the man disgraces me, seizes and keeps my prize, / he tears her away himself!"[84] This was the action and the reaction to what initially made Achilles so furious, shocked in fact, by this outrage of Agamemnon. So enraged that he withdrew from the fighting and implored Zeus to wreak the worst upon the Greeks while he retreated to the comfort of his ships.

Achilles' anger has a crucial place in this interpretation. By looking more closely into his anger, and more specifically into how Homer presents it throughout *The Iliad*, further justification for my hypothesis that Achilles came to fundamentally reject this warrior society can be found. Again, Achilles and his rage are likely the two most famous words associated with *The Iliad,* and they are evidenced everywhere throughout the text: in the famous opening words, in the above-quoted lines, in others such as "but *he* raged on, grimly camped by his fast fleet, / the royal son of Peleus, the swift runner Achilles," in Book V, and even in the closing Book of the poem, Book XXIV, when King Priam comes to ask Achilles for Hector's body and Achilles warns Priam to be careful because of the anger still brimming underneath.[85] Therefore, from the opening words to the closing Book, readers are shown Achilles' anger, and thus it is obvious that Homer wanted his readers (originally listeners) to know that Achilles' rage never really subsides. And when I combine this observation with my reading of Achilles' statements above regarding Agamemnon and how he had his 'wits ripped away' and what Agamemnon's actions

[84] Homer, *Iliad,* 89.

[85] Ibid., 94.

meant on the societal level, the way in which Achilles is presented when the embassy arrives at his ships in Book IX becomes all the more interesting.

For when the embassy arrives to implore Achilles to return to the fighting, readers find a markedly different Achilles. Here they are presented with an Achilles strumming the lyre and "singing the famous deeds of fighting heroes," and one must wonder why Homer would wish to present Achilles in such a manner.[86] Present him as the poetic outcast strumming his lyre and singing of such things. Again, it becomes evident from the dialogue between the men that Achilles is still very angry, that his rage is only temporarily entombed below the surface, but the question remains as to why Homer would present him in such a manner? Could he be singing of such things because he wishes to have them again? To be on the battlefield fighting and accomplishing famous deeds? Is Achilles nostalgic? Or has the realization of what Agamemnon has done started to sink in and Achilles is beginning to realize that he may never experience the life of a warrior again?

I suggest Homer presents Achilles like this because Achilles has indeed started to come to a new understanding of his situation. Having reflected upon what has happened he has begun to *see* things in a fresh light, realizing in his time away from the fighting that the foundations of this collective have been jeopardized by Agamemnon's actions. He is still angry, very much so, but his anger is operating on a different level, one that is not strictly parallel to nor commensurable with how he feels about the situation now that he has come to see the conceptual foundations of his warrior society in a new light.

Immediately upon the embassy's arrival, Achilles quickly puts down his lyre and warmly welcomes his old friends, making them sit down to take a meal with him, and conversing of old, not outwardly evidencing what he might be thinking. Then, immediately after learning from Odysseus of the bounty Agamemnon is prepared to offer him to return to the battle, the crucial moment comes. Achilles' anger returns, is

[86] Ibid., 257.

combined with his new understanding, and the *Gestalt* switch is complete: Achilles rejects his warrior society.[87]

This rejection comes in Achilles' great speech to the embassy, a speech in which he details his refusal of Agamemnon's offer and which he ends by announcing that he will sail home to Greece in the morning – a more complete rejection of this society being unimaginable. Consequently, readers are left to ask 'what would make him decide to sail home now? Why did he not sail home before?'

I believe that having had time since his withdrawal to reflect on matters, the realization of what Agamemnon has done has dawned on him. He has come to see how Agamemnon has undermined the entire society by stripping him of his *kleos* and *time* when he took Briseis away*,* but then, *pivotally,* when Agamemnon then attempts to *reinstate* his glory and honor through this bounty of gifts and prizes, the full realization of what has occurred hits him. Through Agamemnon's actions *kleos* and *time* have now become empty concepts – meaningless – and Achilles is the first to see this.

For Agamemnon went beyond the boundaries of what is acceptable and unacceptable and the foundations of this society, glory and honor, became puppets in a play which Agamemnon believed himself to be master. Anger is one thing, and Agamemnon was clearly angry when he stripped Achilles of his prize, but what Agamemnon has done through the embassy cannot be explained by anger. It is not because of anger that Agamemnon is attempting to draw Achilles back into the fighting. Other motives – perhaps motives connected to his own glory and honor – seem to be governing his behaviour, and Achilles realizes this and is so unwilling to have anything to do with such an enterprise that he will do the most *un-honorable* thing imaginable: he will sail home, leaving the entire Greek warrior culture behind and the Achaeans to fight on without him.

Through this rejection Achilles comes to view the Greek warrior society in a radically different light. This is seen by the fact that after Achilles rejected this society

[87] The idea of the *Gestalt* switch is important for my argument. Mentioned in footnote 12, Chapter I, it is developed in much greater detail in Chapter III, Sections V and VI.

and stepped outside of this *topoi,* the Greeks were unable to understand Achilles' words and actions. This, again, is connected to Winch's comment that "*A man's [sic] social relations with his fellows are permeated with his ideas about reality*."[88] And there is certainly textual evidence to be found in *The Iliad* that Achilles and the rest of the Greeks did indeed become unable to understand one another, and I argue that this is because they now lived within different social realties.

This is first seen in Achilles' rejection of Agamemnon's gifts and in his rejection of the very tradition-laced and clever appeals of the embassy in Book IX. This rejection, one which is examined in more detail in Section III, supports my hypothesis. For had he accepted Agamemnon's lucrative offer it would have greatly increased both his glory and his honor (not to mention his wealth), and, therefore, one would have to care little about glory and honor to refuse. Yet this is precisely what Achilles does. His new understanding of this society is then further emphasized when he rejects the clever appeals of Odysseus, Phoenix, and Ajax, as all three men appeal directly to aspects of Achilles' past and their once shared *topoi.* Consequently, in rejecting these as well it shows that Achilles must also have little regard for such matters.[89] For had they still been important to him this should have persuaded him to rejoin the battle. Yet they did not.

What I focus on to end this Section, however, is what occurs when the embassy returns to Agamemnon with Achilles' rejection, and how the Greeks fundamentally misunderstood Achilles' words and actions and falsely attribute his recalcitrance to passion-related terms such as rage and pride. In appealing solely to Achilles' anger and emotions, as both readers are accustomed to doing and as the Achaeans themselves come to do, all parties are guilty not only of a shallow interpretation of Achilles, but it is within this shallow interpretation itself that the evidence for a much richer, much deeper understanding of Achilles' and his actions resides.

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[88] Winch, *The idea of a social science,* 23.

[89] Ajax convinces Achilles not to sail home but this is due to '*philia*,*'* or brotherly-love to his fellows, rather than anything else. Understanding this deepens the analysis of Achilles to yet another level. Achilles was a lover of many. He declares that he loved Briseis; he stays only because of Ajax's plea in regard to brotherly-love; and when he returns to the fighting it is solely because of the death of the man he loved more than any other, gentle and kind Patroclus.

Upon returning from Achilles' ships, Odysseus goes to Agamemnon and an assembly of Greeks to report what has happened. This is what he says: "Great marshal Atrides, lord of men Agamemnon,/ that man has no intention of quenching his rage. / He's still bursting with anger, more than ever – he spurns you, spurns all your gifts."[90] This declaration is then followed by these words from Diomedes, a man not present at the meeting with Achilles, but one who must have felt he understood well enough what was happening with Achilles to state such things: "Great marshal Atrides', lord of men Agamemnon –/ if only you'd never begged the dauntless son of Peleus,/ holding out to Achilles trove on trove of gifts!/ He's a proud man at the best of times, and now/ you've only plunged him deeper in his pride."[91]

The specific words used to explain Achilles and his behaviour are pride, rage, and anger, all terms that are emotionally charged and of what I will call of the *aberration type of explanation* – that is, the type of explanation that is used to explain someone's behaviour when it is thought that it is merely an aberration, as when someone is *temporarily* acting under the influence of the passions and not when a fundamental change of worldview or values has occurred. What I want to argue is that in this case the *explanation by aberration* is shallow, lacking both a depth of understanding and the realization that another conception of reality is possible.

However, I do not believe that the Achaeans did not attempt to explain Achilles' behaviour in terms other than these because they were foolish or unwise; these aberration-type explanations are often very good explanations for human behaviour. The Achaeans explained his actions in this manner because they could not see beyond their own conceptual framework (*topoi*) and hence *could not explain it in any other terms*. As explored in the concluding pages of Section I of this Chapter, they could not see that there could exist another social reality beyond their own – a new realm of conceptual possibilities – as they could not see beyond their own *topoi* of *kleos* and *time*. This was their culture. It was their lens for viewing the world. It was, in fact, *their world*, and as such it was all they knew. How, then, could they be expected to see Achilles' actions and interpret his words in any other way?

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[90] Ibid., 274.

[91] Ibid., 275.

Achilles had come to a new conception of reality through his rejection of *kleos* and *time.* The Greeks present at the assembly had not rejected *kleos* and *time*, and thus were unable to see outside of this social reality and understand where Achilles' explanation was coming from. Again, because only Achilles had rejected these core concepts they could not *see* what Achilles now *saw* and thus the two parties were looking at the world through different conceptions of reality. Because of this they simply could not understand Achilles and thus *had* to put his actions down to acts/motives they could comprehend.

Situations like this are easily understandable when looked at from a *topoistic* perspective. For when one lacks the knowledge and understanding to comprehend something, to see outside of their own conceptual framework, one must necessarily frame one's explanations in terms that are comprehensible to oneself. This comes back to the idea expressed earlier that human beings can only *know* that which they *know* to exist. When Achilles stopped looking at the world through the conceptual framework of *kleos* and *time*, he and the Achaeans lost that crucial commonality, the 'anchor,' which gives words and actions meaning*,* and he entered a new reality based on different foundational concepts. Because the Achaeans were still within Achilles' former social reality (*topoi*), and because they were at this stage unable to see outside of it as they themselves did not know yet that it existed, and because Achilles was as yet unable to make his new reality understandable to them, they attempted to make sense of him and his actions in the only way known to them, not understanding or comprehending that a wholly different conception of reality existed just outside of their own. And this type of understanding, the understanding that other interpretations of reality always lie right around the corner, is a cornerstone of the *topoistic* perspective.

To explain this another way, I offer the following from Czech philosopher Erazim Kohak and his *The Ember and the Stars*. Kohak is writing about the phenomenology of Edmund Husserl and Husserl's "analysis of the intersubjective constitution of objective," and while these terms are not important here, the excerpt and a brief examination of it can help to elucidate the preceding:

> The intersubjective consensus establishes something very like a collective solipsism. Speakers, seconding each other, constitute a shared, internally

> determined monad into which the world can enter only in predetermined categories. Within it the human has nothing to save him from his knavery and folly, now sanctioned by the consensus of consenting adults. A philosophy which begins with a consensus will not easily penetrate beyond the shell of our collective monad. To do that, we must first suspend that consensus in the radical brackets of solitude.[92]

Important here are the terms, '*monad*,' '*collective monad*,' '*predetermined categories*,' '*brackets*,' '*collective solipsism*,' and '*radical brackets of solitude*,' as these speak directly to the impasse between Achilles and the Achaeans. Kohak is describing how a group of people can come to collectively block out aspects of reality and find themselves in a collective solipsism: a situation in which the collective is unable to imagine another reality existing outside of their own, even believing that their reality is all that exists.

The monad is a concept I have mentioned several times already and it comes from the German philosopher Gottfried Wilhelm Leibniz (1646-1716). What a monad represents is an essentially self-enclosed entity, an entity unto itself, indivisible and absolute. And while Leibniz postulated his theory of monads as a metaphysical theory to account for physical reality, Kohak uses it to highlight the isolation and individuality of what he then calls the collective monad, a conception very similar to what I call a *topoi.*

The collective monad is a collective way of seeing and experiencing the world. It is, in fact, a way of seeing the world unto itself, and consenting adults and "*the world can enter [it] only in predetermined categories*." Parallels between these ideas and those of Winch should be obvious. Winch: "when we speak of the world we are speaking of what we in fact mean by the expression 'the world': there is no way of getting outside the concepts in terms of which we think of the world."[93] The connection I make between the two is that the concepts through which one sees the world (Winch) are the predetermined categories through which the world is able to enter (Kohak), i.e. one only sees aspects of the world that one's foundational concepts *permit* one to see.

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[92] Erazim Kohak, *The Embers and the Stars,* (Chicago: University of Chicago Press, 1987), 35.

[93] Winch, *The idea of a social science,* 15.

The result of entering into a collective monad with its predetermined categories can be "*knavery and folly*," that knavery and folly which comes from believing that this is *the way* of seeing the world, and which is the result of consenting to, and then adhering too strictly to, the predetermined categories of a collective monad. When a group of consenting adults gets together and, "*seconding each other*," allows the world to enter only through these predetermined categories, they fall into a collective monad: a blocking-off or bracketing-out of external realities that results in an isolated, closed-minded mentality that is difficult to emerge out of, as "*a philosophy which begins with a consensus will not easily penetrate beyond the shell of [the] collective monad*."

The Achaeans, including Achilles, were in a consensual, collective monad. There was a consensus about how one was to speak and act, and *kleos* and *time* were two of the foundational concepts that made up their predetermined categories. The world entered for the Achaeans, in other words, through *kleos* and *time* and thus the world was 'the world' for them as seen through the lens of *kleos* and *time:* these where the concepts through which they mediated and 'made sense' of what they encountered in the world. Consequently, these two concepts further structured the lives of those within the collective monad through the rules, norms, and standards of behaviour which then gave their words and actions meaning.

For how long this warrior society functioned in this capacity is pure supposition, but in *The Iliad* Homer presents Achilles penetrating the shell (boundaries) of this collective monad. This he accomplished by withdrawing from the fighting and entering the "*radical brackets of solitude*" aboard his ships, and reflecting upon what happened with Agamemnon.[94] The result of this withdrawal was his coming to a new reality outside of the collective monad, and this was accompanied by an inability to communicate his new vision to the other Achaeans.[95] Achilles did not reject Agamemnon's offer and the

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[94] There is also a time element here. The penetrating of the collective solipsism is the first step which may then lead to a shift into a new collective monad, so when the Greeks initially do not understand Achilles this does not mean they will never understand Achilles. Paradigm observers like Achilles can come, after some time, to make their ideas understandable, and this is explored in the Conclusion to Chapter III. There is a dynamism and fluidity to all of this, and this temporal and proselytizing aspect is central to the structure-behaviour dialectic. Things changes, change often comes with a paradigm observer *seeing* the world in a new light, then come the difficulties involved in attempting to explain and convince others of their vision.

[95] The collective monad (*topoi*) is ubiquitous throughout the world and all humans today likely live within more than one collective monad, structuring our reality accordingly. However, there are possibly situations where people still live within a single *topoi* (tribes in the Brazilian Amazon) and

appeals of the embassy because he was mad. He rejected these because Agamemnon had trampled upon *kleos* and *time*, rendering these once foundational concepts obsolete and this allowed Achilles, before any of the other Achaeans, to see the emptiness of this warrior culture.

this is when the collective monad is the collective solipsism. It is here when an entire collective can be unable to *imagine* another reality outside of its own, and perhaps the situation the Achaeans were in when they were unable to comprehend Achilles and had to then resort to terms they found intelligible within their own social reality in order to 'make sense' of his actions.

Section III – Rules of Understanding and Conceptual Foundations

Peter Winch develops his arguments in *The Idea of a Social Science and its Relation to Philosophy* from a Wittgensteinian perspective in regard to logic and rules. In this final Section of Chapter II I will continue to use Winch's ideas and analysis, combining them again with textual support from *The Iliad* to argue that in order to have meaningful communication one must follow rules. I will argue that the reason why Achilles and the Achaeans became unable to understand each other was because Achilles stepped outside of their rule-governed social system.

For once Achilles stepped outside the Greek warrior *topoi* he and the Achaeans lost the 'anchor' through which meaning and coherence are attached to words and actions. To make this argument I rely on two concepts, the *three anchors of communication*: social convention, agreed-upon definitions and physical setting, and the afore-mentioned *realm of intelligibility*. By combining these I show how Achilles and the Achaeans became unable to understand one another once Achilles stepped outside the *kleos*- and *time*-based *topoi* because *kleos* and *time* were themselves additional anchors that made communication possible. With these anchors gone, Achilles stepped outside of the Achaeans' realm of intelligibility and effective communication became an impossibility.

I am guided through this Section with another short quote from Winch: "So the question: What is it for a word to have a meaning? leads on to the question: What is it for someone to follow a rule? Let us once again start by considering the obvious answer. We should like to say: someone is following a rule if he always acts in the same way on the same kind of occasion."[96] To make my analysis I take from this quote the concepts of meaning, consistency, and predictability: a word comes to have meaning when it is agreed upon in its usage and when this usage is structured by rules that allow for consistent and predictable usage.

Therefore, if to use a word properly and within its rules of usage means to use it consistently and predictably, then to go beyond these rules and use a word outside of its

[96] Winch, *The Idea of a Social Science*, 28.

agreed-upon usage is to act inconsistently and unpredictably. To be unpredictable with one's use of words is to be incoherent; it is to be incomprehensible. Moving this from the realm of language to the realm of society, as the foundational concepts of their warrior society, *kleos* and *time,* also structured the Achaean's rules, norms, and standards of behaviour, by dropping this anchor and speaking and acting outside of this realm, Achilles was seen as acting unpredictably and inconsistently. And by acting unpredictably and inconsistently, from the Achaean's point-of-view, he became incomprehensible. He became, in a word, irrational.

This analysis hinges on three pieces of textual evidence from *The Iliad*, two of which were mentioned in Section II: Achilles' outright rejection of Agamemnon's gifts, his rebuking the clever appeals of the embassy to rejoin the Achaean forces, and how the Achaeans were twice "struck dumb" by Achilles rejection when Odysseus reported back to Agamemnon and the assembly. I argue that this rejection was incomprehensible to the Achaeans because in rejecting these he stepped outside of the rules of behaviour, outside the realm of the consistent and predictable, and consequently, from within their *topoi* they were unable to understand him.

Had Achilles either accepted the gifts from Agamemnon or been swayed by the clever arguments of the embassy and rejoined the fighting, he would have been acting both predictably and logically. His actions would have been instantly comprehensible and understandable; they would have '*made sense'* to the Achaeans. But he did not. And that the Achaeans were unable to see it this way is clear, as they were subsequently "struck dumb" by Achilles words, unable to comprehend what he was saying or doing.

The idea that holds these two levels of analyses together – the use of rules in language (words) and in social contexts (words and actions) – is that of the '*anchor'*. For this essay I limit them to three for language: social convention, agreed-upon definitions and physical setting, with the fourth of conceptual foundations being added for social actions. These anchors operate by regulating and specifying contextual appropriateness and by ensuring predictability and consistency with the use of words and actions. It is through these anchors that words and social actions are understood by one's peers, and

this anchoring is governed by rules and logic so as to structure, mediate and organize interactions and understanding in collectives.

The rules are mutual agreements among members of a collective and without such rules there can be no standard by which to judge the accuracy of word usage or an action, nor can there be any shared meaning. Logic governs both how a term or action is to be used in a specific context and how it is to be applied predictably and consistently. Therefore, one follows a logic-based rule when one does the same thing on repeated occasions in the proper setting: using a word, performing a ritual, etc., and this results in shared agreement and understanding among a group of people.

I introduced physical *topoi* in the General Introduction and I can use this concept once again to highlight this point. While one action may be consistent and logical within one place, say the local pub, this same behaviour in another place, say a church, would likely be viewed as illogical and inappropriate. It would not 'make sense' in this different *place*. This is because within physical *topoi* there are rules and understandings that guide words and conduct and in many instances rules and behaviours between places are incommensurable. To jump up and yell in the local pub would be understood there as a part of the place, whereas the same action would be perceived quite differently in a church. As the ability to communicate and act understandably in a place comes from predictability, consistency, and shared agreement through rules, norms and standards of behaviour, by following these standards when in the appropriate place one comes to be understood and effective communication amongst a group of people can occur.

To be predictable and consistent in words and actions, then, is to logically follow the pattern that has been set by the rules of language use and the conceptual foundations of the *topoi*. It is when one steps outside of this realm of predictability and consistency, precisely what happens when someone steps outside of their *topoi,* that one comes to be misunderstood. The person who uses a word in accordance to how they have used it in the past is following a rule that makes their use of the word both predictable and understandable. The same type of logic is at work when it comes to understanding actions on a social level. Consistency and predictability within a place leads to a harmony of understanding. Inconsistency to incomprehensibility.

To make this clearer, I introduce the *realm of intelligibility*. The realm of intelligibility is a heuristic that delineates the boundaries of understanding by making clear how collective understanding occurs on *levels* and how understanding is governed by rules and logic. It is linked to the *topoi* in that both the realm of intelligibility and *topoi* are structured so that actions can be understood in terms specific to the realm and *topoi* in question.

The realm of intelligibility has boundaries, limits and each level within it is an entity unto itself, logically incommensurable with the other levels. These levels, already encountered several times, are the correct/logical, the incorrect/illogical, and the irrational. To be within a particular realm of intelligibility is to be on the first two levels. To be outside is to be on the third level. To be within the realm of intelligibility in language usage is to be within the first two realms where words are either used correctly, or words are used incorrectly but are still understandable and can be corrected and remain within the realm of intelligibility. To be within the realm of intelligibility on the social level is to be on the first two levels of the correct/incorrect with one's words and actions, and this is to be within the rules, norms, and standards of behaviour of the *topoi.* Words and actions that are illogical can be corrected or explained away by the devices such as the explanation by aberration and still remain within the realm of intelligibility. The crucial distinction is the uncrossable divide that exists between the second and third levels: the illogical/correctable and the irrational.

Because the Achaeans could not see outside of their *topoi,* they took Achilles to be on the second level, the 'incorrect,' or illogical. He was, to them, acting in such a way that he could still be corrected and they believed that he was still within their realm of intelligibility. However, what they failed to understand was that when Achilles dropped the 'anchor' of *kleos* and *time* he moved to the third level and thus beyond what the Achaeans were able to logically understand. He had gone beyond the logical/correct and the illogical/incorrect, beyond that which could be immediately understood or corrected, and he now saw reality in a completely new way. He now knew what it meant to be rational in an irrational world.

As humans see the world through and in light of the conceptual foundations at the centre of their various *topoi,* and as these *topoi* structure and mediate their experience of the world by way of conceptual filtering and by allowing the world to enter

through “predetermined categories,” when a member of a collective steps outside the shared, collective social reality and begins to look at the world from outside this *topoi,* their words and actions seem inconsistent and unpredictable, just as words used beyond the first two levels of the realm of intelligibility are inconsistent and unpredictable.

Achilles became the great warrior and legendary Achaean he was because he was always attempting to win glory and honor. This type of behaviour, then, would have been *logically expected* of him in the future, as it would have been predictable and understandable, precisely what it means to be following a rule. And so when Achilles rejected both Agamemnon and the clever appeals of the embassy and did not allow his glory and honor to be restored, he was acting outside the rules of his society and thus his actions were incomprehensible to the rest of the Achaeans. Had he accepted, it would have been a confirmation of the validity of the glory- and honor-based society that he was once a part of as from within this *topoi* it would have been the *logical* thing to do. He would have been following a rule of behaviour in the same manner as when one uses the word ‘mountain’ to talk about a mountain. But he did not. Instead he yelled ‘*alang-alang*’ by announcing he would sail home to Greece, the Achaeans misinterpreted this as ‘table!’, and there was a fundamental lack of understanding.

In his rejection of the foundational concepts of this *topoi* Achilles shifted outside the realm of intelligibility, outside the levels of the correct/logical and the incorrect/illogical, and into the realm of the irrational: the level where two parties look at the same phenomena from such divergent perspectives that they are no longer *looking at the same thing anymore.* Both parties still saw the Trojan War in front of them, however, the material phenomena were now separated by a gap of incommensurable conceptual organization. To the Achaeans the ‘correct’ thing to do was to continue fighting. After being robbed of Briseis and his initial withdrawal, continuing to fight seemed the ‘illogical’ thing for Achilles to do. But after Agamemnon attempted to re-instate his glory and honour, continuing to fight then appeared utterly irrational; so irrational that the best course of action was to sail home to Greece.

When a situation arises that a person speaks or acts in terms outside of the realm of intelligibility, outside of the prevailing *topoi,* those still within it are unable to

comprehend what is being said. This is exactly what occurs not once but twice in Book IX, when the Achaeans are twice "struck dumb" by Achilles' rejection and the announcement that he will sail back to Greece: "A stunned silence seized them all, struck dumb – Achilles' ringing denials overwhelmed them so";[97] "Silence held them all, struck dumb by his story, Odysseus' words still ringing in their ears."[98]

They were twice "struck dumb" because this rejection and Achilles' intention to sail back to Greece were beyond what the Achaeans could predict and comprehend. From the Greek's perspective, this type of behaviour would be egregiously dishonorable, but for Achilles there was now nothing dishonorable about it, it had become for him the *logical* thing to do. For after his conversion honor did not *mean* the same thing to him as it did to the rest of the Greeks; it no longer had the same bearing, was no longer bound by the same rules, and was viewed in entirely different terms. The Greeks still saw the world *through and in terms of kleos* and *time,* whereas Achilles did not. And as highlighted in Section II, this not only makes all the difference in the world, this, in fact makes the world 'the world.'

[97] Homer, *Iliad,* 266.

[98] Ibid., 275.

Conclusion

Once Achilles rejected the conceptual foundations of his warrior society understanding between him and his peers was unattainable; the possibility of rational dialogue gone, as the two parties moved beyond the realm of understanding and explanation and into two separate social realities: into the realms of the logical/correctable and the rational/irrational.[99]

As the British philosopher Bernard Williams (1929-2003) writes in his *Ethics and the Limits of Philosophy* "rational conversation between two parties, as an actual event, needs something to hold it together."[100] With *kleos* and *time* gone, Achilles and the rest of the Greeks no longer had that common thread by which their dialogue could be held together. Put another way, this time in the words of American journalist Thomas Friedman: "the Austrian-born philosopher Ludwig Wittgenstein once remarked that if you ask a man how much is 2 plus 2 and he tells you 5, that is a mistake. But if you ask a man how much is 2 plus 2 and he tells you 97, that is no longer a mistake. The man you are talking with is operating with a wholly different logic from your own."[101]

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[99] To be on the third level of the realm of intelligibility is to be within a different social reality.

[100] Bernard Williams, *Ethics and the Limits of Philosophy* (London: Routledge, 2011), 31. eBook Collection. http://web.b.ebscohost.com.proxy.lib.sfu.ca/ehost/ebookviewer/ebook/bmxlYmtfXzM2MDUyOF9fQU41?sid=af2fc180-3886-4a5f-897b-4cae2e31e00d@sessionmgr102&vid=0&format=EB&lpid=lp_iv&rid=0

[101] Thomas Friedman, *From Beirut to Jerusalem* (New York: Anchor Books,1990), 431.

Chapter III: Why the *Topoi* Matters

To the Enlightenment, that which does not reduce to number, and ultimately to the one, becomes illusion; modern positivism writes it off as literature.

Theodor Adorno and Max Horkheimer*, Dialectic of Enlightenment*

As the twenty-first century unfolds, it is becoming more and more evident that the major problems of our time – energy, the environment, climate change, food security, financial security – cannot be understood in isolation. They are systemic problems, which means that they are all interconnected and interdependent. Ultimately, these problems must be seen as just different facets of one single crisis, which is largely a crisis of perception. It derives from the fact that most people in our modern society, and especially our large social institutions, subscribe to concepts of an outdated worldview, a perception of reality inadequate for dealing with our overpopulated, globally interconnected world.

Fritjof Capra and Pier Luigi Luisi*, The Systems View of Life*

Introduction

My main argument in this third Chapter is that the overwhelming majority of people in the West are today *looking* at the world in the wrong way. I say *looking* because, as should be evident by now, everyone sees the world through specific *topoi* and the prevailing, dominant *topoi* today is causing people to *look* at the world in a specific way. And while there is nothing intrinsically wrong or out of the ordinary in this, as this dominant *topoi* was born in another era, in another time, and because the world has changed because of this topoi, people must today learn to see the world anew.

While much may appear well and good today, there also appear to be gaps where the old *topoi* and the new reality are not necessarily in sync, a situation both natural and understandable, not one to lament nor lose sleep over. In the internal jumble that is a human society various elements change and others remain static and there is always a certain amount of friction between present realties and past habits. Eventually this friction can reach the point of catastrophic breakdown, but only if people remain too rigid. Part of my concern is that modern society is still guided by the distilled ruminations of a handful of dead philosophers who unleashed on the world a *topoi* that is now as worn-out as it patchy. The inability to change and adapt to changed circumstances, as the world today is fundamentally not the world it was when these ideas were formulated, could be catastrophic.

This argument is based on the recognition of an important aspect of human life: all things must change and adapt or they will encounter difficulties.[102] In human societies structure begets behaviour and behaviour begets structure in a manner that is not linear, cyclical nor wholly progressive. It just is. And it is due to the unpredictable dialectic between structure and behaviour that the human world is constantly changing. Therefore, as the world is constantly changing, so too must people's vision of the world, the overarching *topoi,* occasionally change as well. For if the world changes and people are still looking at it with 'old' eyes, they will necessarily be misguided in what they see.

[102] The Catholic Church; Universities; The DSM; Witch Trials; War. All entities change over time and this change comes from change itself. Nothing is static and the only thing that can be said not to change is the process of change itself.

Put another way, as the world changes it necessarily brings with it emerging issues and concerns that stem directly from the particular way in which people are then living in the world; and the particular way people are living in the world is itself dependent upon how they are *looking* at the world. As the world changes, because people are brought up, trained, and become accustomed to the 'old' way of looking at the world, this renders them patently unable to see that which remains hidden, as one cannot see the new reality by looking at it with 'old' eyes. Therefore, in order to see that which is hidden, in order to learn to see the world anew, one must come to see that which has not been recognized, and the way to do this is to reformulate and reconceptualize how one is looking at phenomena.

Both with Darwin and Achilles I have been highlighting the paradigm observer, a theme I continue to develop in this final Chapter. I have explored how people come to see the world through specific lenses, or conceptual frameworks, and I have offered a justification for this by presenting my theory of the *topoi* and the *topoistic* perspective. What combines these five elements – *topoi*, *topoistic* perspective, structure-behaviour dialectic, paradigm observer, and seeing that which is hidden – is that it is the paradigm observer who is able to see beyond the confines of the prevailing *topoi* and see that which has remained hidden.

The paradox of the paradigm observer, however, is that any attempt to reformulate their worldview and come to a new way of *looking* must necessarily come by *seeing* that which is unrecognizable with the 'old' perspective. Therefore, the paradigm observer comes to see the world anew by learning how to see the world anew, and *this is done by seeing that which cannot presently be seen.* The paradigm observer, in other words, must learn to see what they cannot see. Because of this paradox I have developed the *topoistic* perspective and explained how it allows one to understand that many different *topoi* exist; that these different *topoi* are based on distinct foundational concepts; that each and every *topoi* is valid in and of itself; that these *topoi* change over time due to the structure-behaviour dialectic; and that by seeing and experiencing the world through different *topoi* we experience the world in radically different ways. What I propose with the *topoistic* perspective, ultimately, is that finding a new way of looking at

the world today begins with learning how to look beyond the reductionist, isolationist mentality that I have been critiquing throughout this essay.

My hypothesis is that if one can first recognize the *topoistic* reality of the world and learn to move away from this reductionist mindset, one steps closer to finding a new way of looking at the world today, one that embraces plurality instead of one that chases the absolute. The difference between finding a new way of looking at the world and seeing that which is hidden, however, is a difference of kind, not of degree. The former is what may be achieved with the *topoistic* perspective, the latter is achieved by the paradigm observer. I am not the paradigm observer, and this Chapter will not be attempting to outline what may be hidden today and what this new vision of the world could be.

Sections I and II focus on the first aspect of the *topoistic* perspective and the structure-behaviour dialectic. Section I briefly outlines aspects of the prevailing reductionist *topoi* and how this way of looking at the world is incompatible with present realities. Section II introduces ideas related to how one might learn to look beyond our current *topoi* and outlines the three aspects of the *topoistic* perspective.

Sections III and IV examine the second aspect of the *topoistic* perspective, the span of *topoi* from the large to the small and what this means for modern society today. Section III enters the realm of training, education and culture to explore how it is that people are trained to see the world in specific ways. Section IV looks more closely at Science to develop a better understanding of *topoi*, focusing on the dangers of appropriating *topoi* from one realm to another.

Sections V and VI look more closely at the third aspect of the *topoistic* perspective, the importance of conceptual foundations, while also exploring more specifically the difficulties and challenges of associated with the paradigm observer. Section V explores the phenomenon of cultural change through Anthony Wallace's *revitalization movements* and offers an example of the type of processes involved in a paradigm observer coming to see that which is hidden. Section VI examines the importance of conceptual foundations for how one looks at the world and argues that if one is going to learn to see that which is hidden, a reformulation of conceptual foundations might be the place to begin. The Conclusion highlights the last difficulty in

learning how to see the world anew: communicating this new vision to others, emphasizing what I having been calling the *to-be-heard* hurdle throughout.

To explore "why the *topoi* matters," the following authors and books are referenced below. As several authors are cited in multiple Sections I provide an aggregated overview here as opposed to having them in the preceding paragraphs with the main themes of each Section. In Section I E.A. Burtt and his *The Metaphysical Foundations of Modern Science;* C. Wright Mills' *The Sociological Imagination;* and E.V. Walter's *Placeways: A Theory of the Human Environment.* Authors referenced and cited in Section II include Giambattista Vico, Johann Wolfgang von Goethe, Norwood Russell Hanson and his *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science,* and Michael Polanyi's *Personal Knowledge: Towards a Post-Critical Philosophy.*

The chief sources for Section III are Karin Knorr-Cetina and her *Epistemic Cultures: How the Sciences Make Knowledge,* Walter's *Placeways,* and Hanson's *Patterns of Discovery.* Both this and the next Section also include key contributions from the literary theorist Carline Levine and her *Forms: Whole, Rhythm, Hierarchy, Network.* Section IV combines the work of several authors already citied, including Norwood Russell Hanson and Michael Polanyi, as well as contributions from Stephen Toulmin and James Marcum's *Thomas Kuhn's Revolution: A Historical and Evolutionary Philosophy of Science?*

Section V, focuses exclusively on Anthony Wallace and references two of his essays in regard to *revitalization movements*. Section VI combines ideas from Hanson's *Patterns of Discovery* with aspects of Bertolt Brecht's play *Galileo,* while the Conclusion unites the ideas of Michael Polanyi and Anthony Wallace.

Section I – Galileo, Descartes, and Newton: On the Road to Reduction

This Section continues the critique begun in the Darwin Chapter in regard to the overarching Western cultural *topoi:* the reduced, the neo-neo-Platonic, the singular.[103] I focus on a brief overview of its historical formation and key figures (paradigm observers), and I begin here as it is a necessary first step in the quest to see the world anew as the situation today is a direct result of the behaviours, structures, institutions, norms, values, methods, etc., built up in the past. If seeing the world anew involves looking at it with 'new' eyes, one must first understand the central concepts, presuppositions, and ideas central to the 'old' way of looking at the world.

The prevailing *topoi* of the modern world – read: globalization – began to be formulated roughly four hundred-years ago by Italian physicist Galileo Galilei (1564-1642), French philosopher Rene Descartes (1596-1650) and English mathematical physicist Isaac Newton (1642-1726). I begin with Galileo as he initiated the transition into this *topoi* with achievements such as his re-conceptualization of Aristotle's theory of motion.[104] This was crucial because in expounding his theory he emphasized two methodological changes that became, and remain, central components of this *topoi*: (1) the split between primary and secondary qualities; and (2) the idea that mathematics is the language of nature and that in order to understand nature one necessarily has to

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[103] 'Neo-neo-Platonic' because Neo-Platonic is already taken. Meant to highlight the drive in this mentality for universals, for reducing entities to a single mechanism, a single explanation. That Plato lurks in the shadows of modern science and Western theology is evident to once one becomes familiar with these traditions.

[104] The fluidity of *topoi* is further evidenced in the shift from the Aristotelian/Medieval *topoi.* This shift was essentially two-fold and Galileo's achievement was crucial. The two foundations of the Medieval *topoi* scuttled in this transition were Aristotle's theory of motion and his belief in a two-tiered cosmos and uniform circular motion; Galileo was central in abolishing the first two, Johannes Kepler crucial in the later. Newton then came along and combined these ideas and the new *topoi* was established. American philosopher of Science Norwood Russell Hanson explains Galileo and Kepler's dual importance thus: "[Galileo's] break with tradition was essential for his later retroductions from phenomena, *Ii accidenti,* to principles which could explain those phenomena. It parallels Kepler's break with the tradition which required planets to move in perfect circles or in paths which were combinations of circular motions." Norwood Russell Hanson, *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science,* (Cambridge: Cambridge University Press, 1961), 41.

'speak' in the language of number and mathematics.[105] These changes represented a marked shift from the prevailing Aristotelian and Medieval *topoi* and its more qualitative approach to phenomena, and their ultimate effect was to put mathematical physics at the top of the intellectual and methodological pecking order, where they remain to this day.[106]

American philosopher E.A. Burtt (1892-1989) highlights these central features of Galileo's methodological shift in his 1924 text *The Metaphysical Foundations of Modern Science*:

> Swept onward by the inherent necessities of this mathematical metaphysic, Galileo, like Kepler, was inevitably led to the doctrine of primary and secondary qualities, only with the Italian genius the doctrine appears in a much more pronounced and developed form. Galileo makes the clear distinction between that in the world which is absolute, objective, immutable, and mathematical; and that which is relative, subjective, fluctuating, and sensible. *The former is the realm of knowledge, divine and human; the latter is the realm of opinion and illusion*[107] (emphasis added).

Reading this one can immediately appreciate the influence this type of thinking must have had on another of the key figures in this movement, Rene Descartes. A contemporary of Galileo, in 1641 Descartes published his famous *Meditations on First Philosophy*, a book which presented to the educated elites of Europe his dualist metaphysics. Descartes' rationalist metaphysical scheme echoes Galileo's split between

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[105] Galileo is quoted in York University professor Neil Evernden's *The Natural Alien*: "Now I say that whenever I conceive any material or corporeal substance, I immediately feel the need to think of it as bounded, and as having this or that shape; as being large or small in relation to other things, and in some specific place at any given time; as being in motion or at rest; as touching or not touching some other body; and as being one in a number, or few, or many. From these conditions I cannot separate such a substance by any stretch of my imagination. But that it must be white or red, bitter or sweet, noisy or silent, and of sweet or foul odor, my mind does not feel compelled to bring in as necessary accompaniments. Without the senses as our guides, reason or imagination unaided would probably never arrive at qualities like these. Hence I think that tastes, odors, colors, and so on are no more than mere names so far as the object in which we place them is concerned, and that they reside only in the consciousness. Hence if the living creatures were removed, all these qualities would be wiped away and annihilated." Neil Evernden, *The Natural Alien: Humankind and Environment* (Toronto: University of Toronto Press, 1993), 17.

[106] Overtaking Theology, the discipline that was for centuries referred to as the 'Queen of the Sciences.'

[107] Edwin Arthur Burtt, *The Metaphysical Foundations of Modern Physical Science* (Garden City, NY: Doubleday, 1954), 83.

primary and secondary qualities, in that in it Descartes likewise separates the world into two realms, the *res extensa* and the *res cogitan*s. Taken together, Galileo and Descartes' methodological innovations divided the world neatly into that which can be know for certain and that which is merely speculative, "*opinion and illusion*" as Burtt remarks, and they created a distinct hierarchy which overwhelmingly supported certain aspects of reality and completely neglected others. In the process they solidified a rationalistic – as opposed to a phenomenological/common sensical – mechanistic – as opposed to an holistic – and mathematical – as opposed to a qualitative – hierarchy which still dominates Western thought today.

It was forty-six-years later that a third great figure in this movement, Isaac Newton (1642-1726) published a book that changed the world: *Philosophaie Naturalis Principia Mathematica (Mathematical Principles of Natural Philosophy*). In this book Newton cemented Galileo and Descartes' vision in what may be the greatest intellectual and scientific accomplishment the world has ever seen. Though achievements such as the differential calculus – the immense intellectual achievement of first realizing and then demonstrating that if we isolate and break phenomena into infinitely tiny pieces we can achieve the impossible: the analysis of continual change – Newton not only aided but solidified the prestige of these rationalist, mathematical, reductionist methods.[108]

Writing with no hint of hyperbole, their impact and the world they created, both metaphysically and physically, has been immense. Stephen Hawking wrote of Galileo in *A Brief History of Time*: "Galileo, perhaps more than any other single person, was responsible for the birth of modern science."[109] Descartes, not to be outdone, is universally acknowledged as the father of modern philosophy, a fitting sobriquet, as one cannot attempt an understanding of ontology or epistemology today without reckoning with his thought.

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[108] Newton's calculus works to a remarkable extent, hence his great legacy and fame. But it remains unable to tackle many motion-related problems. For example, it cannot solve what is known today as the 'Three-body problem,' but this does not invalidate his immense achievement. However, perhaps it helps to validate my argument that modern societies need to find new ways of looking at the world in light of these shortcomings, if they can ever actually be called that.

[109] Stephen Hawking, *A Brief History of Time: From the Big Bang to Black Holes* (Toronto: Bantam Books, 1988), 179.

And as for Newton, by mathematically demonstrating the laws of motion and universal gravitation Newton connected the stars and the earth into a coherent system, he laid the foundations for modern physical science, and he capped off an intellectual revolution begun by the Polish astronomer Nicolaus Copernicus (1473-1543), the English philosopher Francis Bacon (1561-1626), and the German mathematician Johannes Kepler (1571-1630). In doing this he changed the way all subsequent natural philosophers viewed the world and their relationship to it, the true mark of a paradigm observer. For as E.A. Burtt remarks on the enormity of Newton's impact: "a penetrating study of post-Newtonian philosophers quickly reveals the fact that they were philosophizing quite definitely in the light of his achievements, and with his metaphysics especially in mind."[110] Therefore, all scientists and philosophers who came after Newton had to reckon with his accomplishments, as one could not theorize on the highest intellectual levels without wading through the world that Newton had created.

And while there have been and continue to be critical assessments and re-assessments of their methods, techniques, and ideas, the intellectual world today is still largely their world. Due to the scientific and technological achievements brought about by this emphasis on reduction, mathematics, and rationality, quantification and data-analysis are *de rigueur* in the natural and the social sciences today. Intellectuals, business leaders, and government officials have taken the quantification of Galileo, the rationalism of Descartes, turned Newton into a God, and subsequently followed their lead in neglecting and ignoring aspects of reality that do not reduce to such an analysis.

Through these men and their achievements, Westerners have set out to compartmentalize and package into tight categorical boxes an intimately connected, interdependent, and ever-changing reality. Many great minds, and equally many lesser ones, have become convinced that through this isolation and its reduction to number humans can come to *fundamentally* understand the phenomena of the world. In the process they have become so emboldened that many refer to this set of procedures,

[110] Burtt, *Metaphysical Foundations of Science*, 34.

ideas, and principles simply as The Method, eerily similar to Muslims who refer to the *Holy Qur'an* as The Miracle.[111]

Unfortunately, these are idealizations. In an important and very real sense, they are pure idealizations. To strip phenomena of its constituent parts and analyze it only through a few of its components is an idealization – like when one 'forgets' about the numerous idiosyncrasies of their lover and focuses only on what makes them happiest. This is to idealize a human being. What these men did was idealize natural phenomena. Their idealization was a 'cancelling-out,' or simply an ignoring, of aspects of phenomena that could-not-be-explained-by/were-not-amenable-to their method, and then believing that this isolation was not only permissible, but that it was the only way in which phenomena should be understood.[112] And while these idealizations have resulted in remarkable human scientific and technological achievements, it is because of these very achievements that the world has so drastically changed. In other words, because of these methods, ideas and techniques, issues and concerns have emerged which cannot be solved by recourse to the same way of thinking, to the same way of seeing the world, and this is why a new way of looking at the world is needed today.

Put in more forceful language, these idealizations and their concomitant technological manifestations have ushered in an era of seemingly intractable difficulties, with global climate change being at the top of the list. The progression of the structure-behaviour dialectic has resulted in particular human mentalities, behaviours and structures that can are no longer capable of managing this increasingly complex and interdependent world. And as these structures and behaviours – those built-up and reared in the centuries since these men and their achievements – no longer match the reality of the world, the first step in moving forward is recognizing that this dominant, increasingly world-wide *topoi* is based upon specific reductionist, rationalist, and isolationist concepts that are themselves largely responsible for the modern world.

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[111] Both examples of what I argue against: the drive for the reduction of a great diversity of experiences and methodologies down to the singular. *The* Miracle. *The* Method. Such a designation by way of the definite article suggesting that there could be no other way.

[112] Newton famously stating that he claimed no hypotheses, i.e. accepted nothing as true except that which could be proven true by his own methods.

Due to their success, these methods have been widely appropriated. For example, in the centuries following Newton, academics in a number of disciplines attempted to emulate him and forged his methods onto so many diverse disciplines that it came to be called Newtonianism.[113] The Scottish philosopher David Hume (1711-1776) sought to emulate Newton in Philosophy, the English philosopher John Locke (1632-1704) in Psychology, and the French intellectual Pierre-Simon Laplace (1749-1827) went so far as to believe that with Newton's framework and the right amount of information, he could explain all phenomena in the universe.

And to a certain degree the extension of this conceptual framework to other realms of thought is not inherently bad or insidious. Mathematical reduction, numerical analysis, and data collection are important tools for both the natural and the social sciences, but their limitations need to be understood.[114] The above remarks on Newtonianism are only meant to highlight some of the more extreme examples of this way of thinking. What is concerning, however, is how this manner of thinking and of seeing the world has percolated down and influenced other ways of seeing the world and other intellectual disciplines.

Writing in 1959 American Sociologist C. Wright Mills (1916-1962) examined the state of Sociology and developed the *Sociological Imagination* as an alternative to what he perceived to be the then dominant modes of sociological inquiry, what he called Grand Theory and Abstracted Empiricism. In regard to the latter, Mills describes it in these terms: "As a matter of practice, abstracted empiricists often seem more concerned with the philosophy of science than with social study itself. What they have done, in brief, is to embrace one philosophy of science which they now suppose to be The Scientific

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[113] Newtonianism as a *topoi,* like Darwinism, as highlighted on pp. 39.

[114] Quantification and data analysis are important. The late Donella Meadows, professor at Dartmouth College, highlights this in *Thinking in Systems: A Primer* where she states that in complex, open-ended systems (such as will be discussed in Section II below) numerical analysis is the first step for a researcher so that an understanding of the functioning and state of the system can be adequately grasped. Once the 'state' of the system is somewhat determined, a researcher can then begin more in-depth inquiries. Data collection and numerical analysis are important, they are just not the only way to approach the world, nor are they a panacea in regard to gaining knowledge/understanding of the world.

Method. This model of research is largely an epistemological construction; within the social sciences, its most decisive result has been a sort of methodological inhibition."[115]

A methodological inhibition due to an epistemological construction. He could have been speaking about Galileo. Of course he was not, and the epistemological construction in Mills' case was that made by social scientists in the twentieth-century when they emphasized the use of methods akin to a numerical and mathematical positivism over more qualitative approaches. And in this case, as with Galileo, these methods naturally led to aggregative, statistical, and numerical biases within the social sciences.

Indeed, this epistemological construction mirrored Galileo's in that it emphasized the importance of the quantifiable over that which was deemed to be merely, again, "*opinion and illusion*," and it was constructed so as to highlight and emphasize certain aspects of social phenomena.[116] The connection of it to the reductionist *topoi* outlined above is seen through Mills' highlighting the fact that abstract empiricism embraced a philosophy of science that was modeled on "*The Scientific Method;*" for the notion of *the* scientific method comes directly from the men detailed above and is, as has already been pointed out, itself based on reductionist ideals.

This methodological inhibition was carried out not only on the epistemological, but also on the pedagogical level through the training of social scientists *en masse* in this methodology; educators believing it to be, again, *The* Method for social analysis. On the epistemological level, then, this inhibition was realized through the belief that phenomena falling outside of the methodology was less important than that which falls within it; and on the pedagogical level, with the training of people to see phenomena in this particular way – through this particular lens – thereby instructing them on exactly what to *look for* in phenomena. The most harmful effect of this being that it trains people

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[115] C. Wright Mills, *The Sociological Imagination* (Oxford: Oxford University Press, 2001), 57; Mills wrote about Grand Theory: "Grand Theory – the associating and dissociating of concepts – is well worth considering. True, it has not had so important an effect as the methodological inhibition that is to be examined in the next chapter [abstracted empiricism], for as a style of work its spread has been limited. The fact is that it is not readily understandable; the suspicion is that it may not be altogether intelligible" *Mills, *Sociological Imagination,* 26.) I accept that in writing this essay I likely fall into Mills' category of a Grand Theorist.

[116] Burtt, *Metaphysical Foundations of Science,* 83; All *topoi* are constructed so as to highlight certain aspects of phenomena. This *topoi,* for example, emphasizes the numerical and mathematical and it is still dominant today, I argue.

in an inability to see anything beyond the constructed boundaries of their methodology (*topoi*), and thus trains them to be unable to see that which is hidden.

How much has changed in the intervening years since Mills' book was written? I cannot say precisely, as assessing the current state of affairs is a remarkably difficult task. A poet friend of mine once named one of her books *I can see my love more clearly from a distance*, and this is a wonderful truth of human life. Many things: love, social trends, fashions, passions, are better seen from a distance, both spatial and temporal, and while we are living in an age and a place it is remarkably difficult to get a precise grasp of it.[117]

I was not surprised, however, when I later encountered Mills' sentiments expressed almost precisely in E.V Walter's *Placeways: A Theory of the Human Environment*. In an early section of the book, Walter describes how researchers at the Boston Housing Authority attempted to understand why two identical buildings in the same housing project suffered from such different recurring states of tranquility and violence – the one always being quiet and pleasant, the other being quite the opposite:

> The research folk at the Boston Housing Authority were also good Aristotelians: they believed that the 'place' could be separated from its contents, and they wanted to understand the contents. They tried computer analysis of all the objective parameters, examining every bit of demographic and social information and sorting out all the variables they could abstract from the tenant record cards, without finding any significant differences. The contrast between the two places could not be explained by abstracting the objective characteristics of the people who lived there. I asked if they had thought of going directly to the places, talking to the people, and seeing for themselves. No one had left the office, not because they were lazy or because they shrank from meeting the people, but because they continued to believe that an explanation must be sought in objective, law-like regularities discovered from the analysis of aggregate data.[118]

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[117] This is related to the structure-behaviour dialectic and the paradigm observer. The person able to see the true state of affairs in their time is rare. Behaviours are emergent phenomena of structures and as such are difficult to grasp and *see* until they have become manifest in new structures. The American environmentalist Rachel Carson (1907-1964), her book *Silent Spring* and the launch of the environmental movement is one such example. The structure of society bred specific human behaviours which once identified by Carson brought new structures and behaviours. She was able to see the true state of affairs and brought others to see it as well, and the world changed and people thought differently after her landmark book. The mark of the paradigm observer.

[118] Walters, *Placeways,* 8.

These researchers, then, sought understanding through a reductive, quantitative methodology that is, in a very literal sense, a type of abstracted empiricism. They sought to understand the situation by the use of data *abstracted* from the phenomena, thereby making it "empirical," and they mirrored the desire to the 'scientific' and follow The Scientific Method in their search for "*law-like regularities*." Consequently, it appears that the methodological inhibition of abstracted empiricism was still alive in the late 1980s when Walter was writing.[119]

I am not certain how all social science research is carried out today – whether or not abstracted empiricism is still in the ascendency – but I do know that when funding is discussed, those in charge of distribution want to 'see' the results, the progress of the research, etc., and this seeing involves numbers. Consequently, social scientists are in a position to quantify their 'findings,' something which due to the incommensurability of this need and the research matter at hand, must be either arbitrary and entirely subjective, or aggregative and statistical – the latter landing them back in the trap outlined above.[120] Social scientists are, put another way, forced to be abstracted empiricists; forced to

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[119] However informally: I have a friend who studies Urban Planning at my university and he is currently working for the company that provides transit for the city of Vancouver. After riding a bus to the supermarket, I asked him if the company pays staff members to ride the buses and report back what they have experienced so as to have a better understanding of what it is actually like to ride the bus. After asking his boss he told me that they did not; that they relied on GPS data, the time it took between stops, driver and rider feedback, and that if there was a considerable problem with a certain route a vehicle would drive beside/behind the bus and observe it in this manner. But no employee is paid to *experience* what it is like to ride the bus, making it appear that abstracted empiricism still reigns in regard to public transit in Vancouver.

[120] Quantification helps determine things in a concise manner. It allows the evaluation of large quantities of variables, such as tests at schools and universities, and without this type of analysis it is difficult to judge which applicant is 'best' when compared with others, for example. However, when entities that are strictly non-reducible to number are attempted to be reduced to number, or when there is reduction to number simply because one believes that this is 'what is supposed to be done,' and this is regarded as the chief way to evaluate and understand phenomena, it is a problem. In fact, it is a very difficult problem to which there seems little in the way of an effective and comprehensive solution. Try, for example, to quantify the impact that sense of community has on poverty. Try to examine West Vancouver, the richest neighbourhood in Canada, with the Downtown East Side, the poorest, by recourse to the same methods and ideas. To look only at wages, incomes, rents, essentially quantifiable variables alone, is to fall into the mentality of the tired *topoi* that I have been outlining here. These may be useful indicators, but thinking in this manner could also be a primary cause of the problems.

produce ‘data’ from social phenomena in a impoverished attempt to mirror The Scientific Method.

There are many aspects and dimensions of life where these methods are strictly incommensurable to understanding and comprehension. This is still, it has to be stressed, a method that predominantly reduces phenomena to mathematical analysis, and *not everything is reducible to mathematical analysis.* C. Wright Mills’ plea for a new *topoi* argues that however important the collection of data is in a number of ways, this methodology/thinking does not actually tell one anything about the system other than what this method *allows one to know*. What this amounts to is a methodological handicapping by putting the proverbial cart before the horse. For if one determines beforehand what is important and what is ‘worth studying,’ and studies only what one believes to be worth studying, one becomes but a slave to their methodology, blind both to phenomena and other ways of seeing the world.

(Un)fortunately, these limitations have been understood for some time. But the fact remains modern society has this love of numbers; of quantifying; of measuring; of reducing. While scientistic spin-offs such as Taylorism, scientific management, and other forms of managerial and organizational theory may increasingly be in the past, modern society has only started to do away with the most egregious.

Intellectuals, business leaders, and politicians still overwhelming look to numbers for guidance and understanding, measuring, probing, and calculating, and it seems as if members of this society are forgetting to take the time to think beyond to the bigger questions. For example, how many more measurements need to be made of the earth’s climate, carbon emissions, or the amount of fossil fuels left in the earth’s crust to convince people to walk or ride a bike? How many more studies of incomes and populations of poor people living in this neighbourhood compared to rich people living in that neighbourhood before someone asks why society is trying to make poor people into rich people, as if all people should fit into some idealized mould and attain this ideal type or way of living? How many more analytic analyses need to be made before people question whether or not there might be something inherently wrong with this cultural system and its dominant methodologies, and that this society might, in fact, be looking at everything from the wrong perspective?

This prevailing, reductionist *topoi,* one which is still spreading throughout the world as I write these words, has resulted in such a changed world that it has almost reached the point where humanity must find a new way of looking at the world, before it is too late. I end this first Section, then, with these words from the Scottish psychiatrist R.D. Laing (1927-1989):

> Galileo's program offers us a dead world: Out go sight, sound, taste, touch, and smell, and along with them have since gone esthetic and ethical sensibility, values, quality, soul, consciousness, spirit. Experience as such is cast out of the realm of scientific discourse. Hardly anything has changed our world more during the past four hundred years than Galileo's audacious program. *We had to destroy the world in theory before we could destroy it in practice*[121] (emphasis added).

[121] Fritjof, Capra and Pier Luigi Luisi, *The Systems View of Life: A Unifying Vision*, (Cambridge: Cambridge University Press, 2016), 21.

Section II – *Verum factum* and the *Topoistic* Perspective

In this second Section I propose an approach for how one may come to look at the world beyond the prevailing, reductionist *topoi*. I also go into greater detail in regard to the paradigm observer and briefly outline why it is that the paradigm observer must come to see that which is hidden in order to see the world anew. I begin, however, with a quote from E.A. Burtt which links key ideas highlighted in the previous Section, to the structure-behaviour dialectic, the paradigm observer, the prevalence and importance of *topoi* in human societies, and why it so difficult to see outside one's prevailing *topoi*:

> It is the ultimate picture which an age forms of the nature of its world that is its most fundamental possession. It is the final controlling factor in all thinking whatever. And that the modern mind clearly has such a picture, as clearly as any previous age that one might wish to select, it will not take us long to see.
>
> What are the essential elements in that picture, and how did they come there? Doubtless it is no mystery why…the precise nature and assumptions of modern scientific thinking itself have not as yet been made the object of really disinterested, critical research. That this is true is…due merely to the fact, itself important enough, that *all of us tend easily to be caught in the point of view of our age and to accept unquestionably its main presuppositions*[122] (emphasis added).

The approach I put forward here is in the spirit of Italian legal scholar and philosopher Giambattista Vico (1688-1744) and his *verum factum* principle, the idea that to truly understand phenomena one must be intimately connected to the matter in a creative and engaged manner; that conscious reflection and a stolid rationalism do not bring 'clear and distinct' ideas from which one can deduce axioms and expect to gain knowledge, understanding, and, ultimately, mastery, over one's self and the world.

My insistence here is on the need to discover a new way of *looking* at the world, one that embraces instead of neglects the multiple and varied dimensions of reality that are found in the world today. Such ideas, of course, are neither mine nor are they new; not only did Vico expresses such ideas, but the German polymath Goethe (1749-1832) also proposed a similar approach to understanding, his method and ideals neatly

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[122] E.A. Burtt, *Metaphysical Foundations of Science*, 17.

summarized in this passage from Professor Frederick Amrine's essay 'The Metamorphosis of the Scientist':

> The reason why Goethe does not follow the more usual procedure of demonstrating immediately the simplest form of the boundary colors, then giving the procedure for deriving the more complicated phenomena, is that for him, the process of working through the series as a whole is more important than the end result. *Experiments must become concentrated, ongoing experiences through which one learns new ways of seeing*.
>
> Given this displacement of product by process, one can understand Goethe's repeated insistence that his scientific work needed to be done to be understood. For example, he writes from Italy that his 'plant system' is 'hard to write in any case and impossible to comprehend from mere reading, even if everything were written ever so sharply and properly' [123] (emphasis added).

Inspired by such ideals, here I outline in more detail my *topoistic* perspective and then offer an example of how one may creatively engage with the world in the attempt to move beyond *that-reduced*. First, the three aspects of my *topoistic* perspective:

(1) **Change:** Understand the structure-behaviour dialectic and the fluid nature of human *topoistic* reality, and how this dialectic necessitates periodically re-conceptualizing physical and social realities. By understanding this one comes to recognize why society today must learn to see the world anew by understanding that both the physical world and the way one looks at it are continually changing. Understand that all *topoi* change over time.

(2) **Plurality:** Understand the span of *topoi* from the very large to the very small and the importance of both large and small *topoi*. In this essay, I have highlighted such *topoi* as Islam, the United States of America, Darwinian Evolution, the Greek warrior society of Achilles, the Sociological Imagination, the Ku Klux Klan, and the Anti-social social club. Understanding that all of these are valid and important *topoi* that determine how different people see and experience the world is central. Further, understanding that because of this *'levels'* of reality exist in the same place at the same time for different human beings. This understanding then leads to a comprehension of what happens when *topoi* interact and overlap one another, an understanding of the incommensurability of *topoi,* and how each *topoi* is specific to itself

[123] David Seamon, and Arthur Zajonc, ed., *Goethe's Way of Science: A Phenomenology of Nature* (Albany, NY: State Univ. of New York Press, 1998), 42.

and why one cannot use standards and beliefs from one *topoi* to judge another.

(3) **Conceptual:** Understand the importance of conceptual foundations and conceptual organization in people's lives and the impact that can be made in one's vision of the world if one is able to shift from one mode of conceptual organization to another.

I propose that to see the world anew the first step is learning to look beyond the reductionist *topoi* and that one may do this through the *topoistic* perspective. My question then becomes how to get other people to do the same. Importantly, the way to do this is not by telling people 'look at the world through a *topoistic* perspective.' This is, in fact, the mentality of the 'old' way of looking at the world. What I try to do here is follow the examples set by Vico and Goethe and creatively engage with the topic to provide an example of how I have attempted to see beyond *that-reduced*. My hope is that then perhaps the reader, too, can creatively engage with the world in their own way and come to see beyond *that-reduced*, and in the process move modern society a little closer to finding the elusive paradigm observer.

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(1) "In order to ask why something is the case, we need first to know that it is the case."[124]

I begin with this statement from Philosophy Professor Robert J. Hankinson and *The Cambridge Companion to Aristotle* as it requires one to engage with metaphysical questions, both ontological and epistemological, the first types of questions one must ask whenever thinking about discovery and new ideas. This is because the first questions one needs to ask in the process of discovery are always akin to: 'does it exist?' and 'how do I *know* that it exists?' However, to better engage with these ideas, here are two examples, one from the physical sciences, and the other from the social sciences.

[124] R.J. Hankinson, "Philosophy of Science," in *The Cambridge Companion to Aristotle,* ed. Jonathan Barnes, 138 (Cambridge: Cambridge University Press, 1995).

When I throw a rock up in the air and watch it fall to the ground I can easily determine *it-is-the-case* that the rock moves upwards and then back downwards to the earth. Empirically this is not difficult to determine. I see the rock falling back down to the ground and, sure enough, every time I throw it up in the air it falls back to the ground. Because of this I am soon able to determine *that-which-is-the-case* in regard to falling rocks – that rocks thrown up in the air *always* fall back to the earth. My next step, then, is to try and determine *why* this is the case, however, when I try to determine *why-this-is-the-case* I must then inquire into the existence of something not so empirically evident, and this, as the history of physics shows, is a much more complicated matter.

Moving to the next example, I state in this essay that *that-which-is-the-case* today is that our society is encountering issues and concerns because people are viewing the world through an out-of-date lens, through the wrong *topoi*. Importantly – and here it gets complicated – in doing this I have actually stated *that-which-is the-case* on two levels, one explicit and the other implicit, *and* a provisional *why-it-is-the-case* for the explicit *that-which-is-the-case*, which brings in a third level. To state that it is *that-which-is-the-case* that people are looking at the world the wrong way (explicit) is also to state that there is a better way in which to look at the world (implicit). Therefore, embedded within this explicit statement is the implicit statement that *that-which-is-the-case* is that there is a better way of viewing the world. I do not attempt to determine or justify *why-it-is-the-case* that there is a better way people could be looking at the world (implicit), although I state a provisional *why-it-is-the-case* for the explicit *that-which-is-the-case*, in that why there is something wrong with the world today is because people are looking at the world the wrong way. What I imply with this is that society could perhaps reach the implicit *that-which-is-the-case* – a better way of looking at the world - by rectifying *that-which-is-the-case* on the level of the explicit – society is looking at the world through the wrong lens today – and I state *why-it-is-the-case* that there is something wrong with the world today is because our society is looking at it the wrong way.

With the falling rock there are only two levels: the rock falling being *that-which-is-the*-case, and the why – see Newton's *Principia* for *why-it-is-the-case*. My example from the social world differs in that I gain an additional level of inquiry/understanding in the implicit *that-which-is-the-case,* and in making this judgement, as I am without a Kantian bedrock analogous to the empirical level of watching the rock repeatedly fall to the

ground, I enter difficult terrain. By having “society today is looking at the world the wrong way” being simultaneously *that-which-is-the-case* on the explicit level and *why-it-is-the-case* for the implicit *that-which-is-the-case,* my inquiry becomes increasingly complex. Going to the next level and trying to state *why-it-is-the-case* that humans are looking at the world the wrong way would be the next step in the process, a step not considered in this essay.

In stating my explicit *that-which-is-the-case* I relied on normative beliefs, theory, and empiricism to conclude that there is indeed something wrong with the world today. I then gave a provisional *why-it-is-the-case* as modern society is looking at the world in the wrong way, through an out-of-date *topoi*. Doing this required an alarming number of ontological and epistemological assumptions and presuppositions, but I did eventually arrive at a *why-it-is-the-case*. To then justify this I came up with ideas such as the *topoi,* the structure-behaviour dialectic, and the realm of intelligibility to support my position. Whether the reader accepts such an analysis, seeing as it is necessarily built upon such shaky epistemological foundations, is entirely up to the reader. All I say is ‘Welcome to the Social Sciences.’

Darwin and other social evolutionists must first ask if it is indeed the case that human societies follow the same trajectory and path of evolution by natural selection, or if they do not. This, likewise, will entail a great deal of empirical research, theory, and a decent amount of normativity. However, if it turns out that this hypothesis is indeed *that-which-is-the-case*, that human societies do indeed follow this same path, they can then begin an inquiry into the system and try to determine *why-this-is-the-case*. However, if it turns out that it is not the case that human societies follow this type of pattern, then their entire analysis will be misaligned from the outset; as will my analysis if it turns out that I am wrong in regard to society, societal matters, and *that-which-is-the-case* today i.e. that we are looking at the world the wrong way and that there is indeed a better way of being/living/seeing the world.

What I am proposing in this Chapter is that *that-which-is-the-case* today is beyond the current overarching *topoi.* That the issues and concerns that exist today, in order to be rectified, must be rectified by seeing the world from beyond the confines of the current *topoi*, a hypothesis that hinges on the structure-behaviour dialectic. For the way modern societies are today structured and the behaviours they promote are not

that-which-is-the-case because the world has changed. Consequently, as the world inevitably changes in such a dialectical manner, in order to keep pace with this change societies must continually strive after *that-which-is-the-case* in regard to social, mental, and physical realities. The result of this, of course, is occasionally formulating a new way of looking at and being in the world.

If this sounds strange, the converse of my argument is found in the wide array of eschatological and End-of-History thinking which posits that humans have, or will, arrive at *that-which-is-the-case* in regard to human social matters. From Christianity, to American neo-Liberal Francis Fukuyama (1952-), to the socialist Karl Marx (1818-1883), to various and multiple so-called Cults, many have put forth theories claiming to have found, or how to find, *that-which-is-the-case* in regard to human social matters. My claim is that as soon as a human society reaches *that-which-is-the-case* in regard to human societal matters the romance will be at best generational; much more like the Ancient Israelites and the Exodus going straight out of bondage only to be lost in the desert for forty years, continually searching for the Promised Land.

What I postulate is that all societies must occasionally reinvent their overarching mental *topoi* and continually learn to see the world anew as the world is constantly changing *due to how people see and experience the world*. People build the world they have in their minds into the physical world they inhabit, and as a result of this built world their minds change again. Therefore, if paradise exists today, it will not likely be here tomorrow, and instead of believing that the Promised Land is always right around the corner, it would be better to heed to the wise words of Goethe's Faust:

> *To this idea I am committed wholly,*
> *it is the final wisdom we can reach.*
> *He [sic], only, merits freedom and existence*
> *who wins them everyday anew.*[125]

[125] Johann Wolfgang von Goethe, *Faust I & II,* trans. Stuart Atkins, (Princeton: Princeton University Press 2012), 292.

There is no *utopia,* and there is no giving up and sitting on one's haunches. There is only accepting this fact of human existence and going out and re-winning freedom and existence again and again.

(2) "Seeing what causes a clock's action requires more than normal vision, open eyes and a clock: we must learn what to look for."[126]

This statement from the American philosopher of science Norwood Russell Hanson (1924-1967) emphasizes an important aspect of the *topoistic* perspective in the levels of knowing and inquiry. I will expand on this quote to show that different levels of 'seeing' are influenced by different levels of understanding, and that these different levels lead to one's seeing and understanding different aspects of reality. Central here is the idea that while empirical phenomena might be objectively the same to three observers, as a cup on a table is objectively a cup on the table to everyone, what each sees and what the cup means to each can be drastically different based on their level of understanding.

The first level is that of the layperson. They see it is the case that the clock has an action but this is purely an empirical recognition with no theory or understanding supporting it. They simply have the ability to see the clock's action. They cannot see or understand the cause of the clock's action (the *why*), but they can undoubtedly see the clock's action; they can see *that-which-is-the-case* on the purely empirical level.

The next level is the clockmaker's level. The clockmaker can see *that-which-is-the-case* in regard to the clock's action, as well as understand *why-it-is-the-case*. Knowing *why-it-is-the-case* on this second level goes beyond the level of the layperson and incorporates theory and understanding of how a clock operates and the mechanics behind it, this being the result of the clockmaker having learned what to look for. Therefore, the clockmaker sees *that-which-is-the-case* both empirically and in regard to the why, the layperson only in regard to the naked empirical fact that the clock has an

[126] Hanson, *Patterns of Discovery*, 59.

action. Consequently, only the clockmaker of the two can genuinely be said to see *that-which-is-the-case* in regard to the clock's action.

On the third level things get a bit more complicated. This level goes beyond the clockmaker's seeing *that-which-is-the-case* and enters a realm in which there is really no analogue in this regard. Here seeing *that-which-is-the-case* moves beyond mechanical categories such as a clock and is associated with open-ended systems like social systems, non-linear stochastic systems, natural sciences, philosophy, theology and the like.[127] On this level one must still learn what to look for, but this learning escapes from the categories of the clockmaker and it is here that one must learn to see that which has remained hidden to others in order to see at all.

To bring this back to ideas expressed earlier, to see that which has remained hidden is to see beyond the prevailing *topoi,* and this seeing involves *discovering* what has always been present, but what has up until now not been recognized. As a clock is a mechanically closed, linear system there can be nothing hidden to be discovered in this sense. There can be no real surprises as the clock is essentially a *closed system*. However, on this third level this changes drastically, changes which will become more prominent following the next quotation.

> *(3) "The paradigm observer is not the man [sic] who sees and reports what all normal observers see and report, but the man [sic] who sees in familiar objects what no one else has seen before."*[128]

The person able to see that which has remained hidden on the third level is the paradigm observer. This is the person able to see outside of the dominant *topoi*, to see *that-which-is-the-case* on the third level when everyone else is unable to do so. It is the

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[127] There are multiple levels on which one can come to see *that-which-is-the-case.* In an earlier paper, entitled *The Wheel,* I examined these topics stating that there are some cases, as in the wheel, where improvements are not possible once you arrive at the wheel. You can make it technologically better by using different materials, etc., but once you have arrived at the wheel you cannot go further, the wheel is *that-which-is-the-case* in regard to a multi-purpose device primarily designed to move things. Here, then, one can appreciate the multiple levels of *that-which-is-the-case:* the purely technological in the case of a wheel and a clock, and the shifting, as with social systems, religious, fashion trends, etc.

[128] Hanson, *Patterns of Discovery*, 30.

person who begins to sense the inherent fallacies and difficulties in the the existing *topoi* and who begins to critically question and look beyond them.

The clockmaker has the ability to make technical fixes because of the very nature of the system that she/he has been trained in; this is what they understand and what they have learned to look for, and the system in which they find themselves presents them with issues of an essentially solvable nature. They see in familiar objects what they have been trained to see and when there are issues they are able to solve them. However, in moving to the level of the paradigm observer, one begins to observe phenomena that are outside the framework of the clockmaker, one sees in familiar objects phenomena of significance that until now have not been identified but which are crucial to the system in question.

Put in the language of the Achilles Chapter and the realm of intelligibility, it is the clockmaker who understands the difference between the logical and the illogical; it is the paradigm observer who understands the difference between the rational and the irrational. The clockmaker sees what they should see and when matters go awry it is within the capacity of the logical to fix it: it is correctable. This is due to the linear and mechanical aspect of the clockmaker's perspective – all must follow logically within the confines of the system as strictly irrational things cannot occur on this level. A clock or a car's engine are such closed systems. When there is a malfunction it can be fixed from within the system and when any part of the system malfunctions this results in the entire system shutting down. However, for one who has learned what to look for, these malfunctions can be logically repaired and the system set functioning again.

The paradigm observer sees in the familiar what no one else can see and this is also related to the nature of the system that she/he is immersed in. Systems on this level are like forests as opposed to being like a car's engine; if one species of plant or animal goes missing, the entire system does not collapse as it is an open, adaptive system. These systems are fluid, dynamic, ever-changing, and it is in systems of this type that the paradigm observer can come to see and recognize that what appears 'irrational' to the layperson or clockmaker is actually eminently rational. This then results in the 'old' way of looking at things becoming patently irrational and is what allows the paradigm observer to shift to a new level of understanding; to a level of understanding where they

are able to see the world in a new light, from an entirely new perspective, and it is this new way of looking that makes all the difference.

The 'clockmaker' mentality is, in fact, related to the mechanistic *topoi* outlined in Section I, though it is through no fault of the creators of this *topoi* that it resides on the clockmaker level. The paradigm observers of this *topoi* – such a Galileo, Descartes, and Newton – did not understand the open-systemic nature of the world and assumed it was a type of closed system. They did this because they did not have the intellectual environment and/or conceptual capacity to understand what an open-ended complex system is, and therefore they were necessarily unable to understand that the world is an open-ended system itself. Recall that it is very difficult, perhaps impossible, for human beings to *know* that which they do not *know* to exist. Therefore they created their worldview based on a closed, mechanistic understanding of nature, and this highlights another crucial reason for why society today must learn to see the world anew today: the originators of the prevailing *topoi* fundamentally misclassified the true nature of the world.[129]

Darwin was the paradigm observer in postulating his theory of evolution by natural selection. Evolution itself was not first proposed by Darwin, but having found existing explanations wanting he dedicated himself to understanding the subject and was the first to give such a resoundingly solid explanation of its main mechanism that others were then able to see evolution by natural selection as well. Achilles came to see the Trojan War in a fundamentally different way than the rest of the Achaeans, seeing beyond *kleos* and *time* to an entirely new level of reality, and as such he too was the paradigm observer.[130] Importantly, both Darwin and Achilles were looking at the *same*

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[129] An open-ended system is one that is not strictly prohibited by the laws of thermodynamics in that it is able to create increasing complexity in the face of entropy. Ideas first put forth by the Russian/Belgian chemist Ilya Prigogine (1917-2003) and now widely accepted. So widely accepted, in fact, that it is now acknowledged that the majority of systems in the world are of this open variety, not of the closed, mechanical variety.

[130] Such is the nature of a *topoi* shifting event that, as we have already seen, Achilles was misunderstood by his peers, and even Darwin and his theory had issues, being rejected not only by the religious establishment but also by much of the scientific establishment in the decades after if was first put forth. In fact, it was not until the 1920s, with the so-called Modern Synthesis which incorporated Mendelian genetics with Darwin's theory that Darwin's views were fully accepted by the scientific community. It still remains locked in a fierce debate, of course, with parts of the religious establishment. The '*to-be-heard'* hurdle, a concept expanded upon in the Conclusion to this Chapter.

world as everyone else, the very same familiar objects in the world, but because they both reconceptualised what they saw, they both came to look at the world in a completely new light, and this is indeed the hallmark of the paradigm observer.

> *(4) "It is a commonplace that all research must start from a problem. Research can only be successful if the problem is good; it can be original only if the problem is original. But how can one see a problem, any problem, let alone a good and original problem? For to see a problem is to see something that is hidden."*[131]

It is the paradigm observer who comes to see a genuine problem and recognize that *that-which-is-the-case* is beyond how the clockmaker is currently looking at the world. This they accomplish by seeing beyond the ordinary and appreciating what has not been recognized, what has remained hidden to all other observers. To see *that-which-is-the-case* on this level is to recognize a problem; it is to intuit, as Darwin did, that there are genuine concerns with the manner in which the currently accepted explanation/way of seeing the world is explaining phenomena in the world, and thus that it is lacking in some fundamental way. It is to recognize, in other words, that the perspective is the problem.

The paradigm observer is able identify a problem due to the manner in which they come to view phenomena and 'familiar objects' in the world. Importantly, one cannot discover a problem from the clockmaker's perspective, one can only see malfunctions, as this is the manner in which the clockmaker has learned what to look for. One can only see a problem on the level of the paradigm observer because to encounter a problem is to see that which is beyond the logical and fixable and recognize the importance of that which falls beyond these confines, and in order to do this one must learn how to look from a fundamentally new perspective. This results in recognizing that which has been unrecognizable, or seeing that which has remained hidden, and seeing on this level simply does not exist from the clockmaker's perspective.

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[131] Michael Polanyi, *The Tacit Dimension*, (Chicago: University of Chicago Press, 1982), 21.

The problem is not a lack of funding if a continuation of funding does nothing but prolong the need for funding. Anything that needs constant support to attain what it cannot attain through its own proper functioning can properly be said to have a problem. The problem is not a lack of funding: but what *is* the problem? It is something beyond this. And looking at it as a lack of funding is looking at it the wrong way. It is looking at it as a clockmaker would when clocks needed to be daily wound; as an inescapable condition of the system. But this is not how the paradigm observer looks at it. The paradigm observer looks beyond for the problem unseen, not noticed, clearly not thought of. And it is only once the problem is identified and a suitable solution proposed and acted upon that the problem will cease to be a problem any longer, something that inevitably results by first learning how to look at the world from the paradigm observer's perspective.

Section III – What *Topoi* Do

This Section and the next continue what was begun in the first Section of the Achilles' Chapter by looking at the various *topoi* and elaborating on the second feature of the *topoistic* perspective. Here I go into more detail on the varieties of *topoi*, exploring how *topoi* range from the very large to the very small, and why seeing and understanding this multiplicity of *topoi* is so important today.

In examining aspects of the overarching cultural *topoi* I emphasize the critique made in Section I of this Chapter by exploring how it is that everyone has a specific way of looking at the world, and that this is consequent on the manner in which people are brought up and indoctrinated in specific cultural *topoi.* I argue that this manner of seeing and experiencing the world becomes so engrained that many people tend not to notice it, it simply becomes *the world* for them, implying in this that many in the West are today being brought up in such a manner that they do not even recognize their reductionist worldview as it has become so engrained in them.[132] I also focus on other levels of *topoi* such as the Anti-Social social club and the Ku Klux Klan and on how these differ from the overarching cultural *topoi* in that these are *topoi* people actively join and initiate themselves in to. Important here is the idea that how one chooses to see and experience the world can very much become how one then sees and experiences the world.[133]

This Section and the next also take a closer look at Science, using it as a framework to highlight both how a *topoi* is structured and how Science can be used as a microcosm for understanding the *topoistic* nature of our social world. By looking at the overarching structure of Science and at the smaller scientific theories within the

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[132] The term 'indoctrinated' is not meant here in a pejorative sense. It is meant to focus on the uncritical acceptance of one's cultural upbringing, not forced or abrasive propaganda or anything of the sort. Merriam Webster Dictionary defines it: "to teach (someone) to fully accept the ideas, opinions, and beliefs of a particular group and to not consider other ideas, opinions, and beliefs," and in the type of overarching cultural *topoi* that I discuss here, indoctrination defined in this manner is not too strong of a word. As much as one may wish to believe one is open-minded and above this, culturally and tribally everyone is not as all humans are indoctrinated to some degree. *Merriam Webster Dictionary,* online verison, https://www.merriam-webster.com.

[133] This is aspect of *topoi* is reminiscent of the Buddha (circa 480BCE-400BCE) saying one becomes one's thoughts. One largely becomes the person they are in modern society by selecting the *topoi* one chooses to be a part of. Those who join finance will learn about the financial aspects of human life and will consequently come to see the world in terms of finance, nurses will see the world in terms of their outlook and daily environment, environmentalists in terms of theirs.

overarching *topoi* of Science, I hope to better highlight how both large and small *topoi* structure, mediate, and organize how one sees and experiences the world. There is 'Science' on one level, an over-arching mentality and conceptual framework that guides people to act and experience the world in particular ways, but as I show with an inquiry into the work of Austrian sociologist Karin Knorr-Cetina (1944-) and her *epistemic cultures*, different branches of science also function as independent *topoi,* prompting practitioners of the different branches to see and experience the world in vastly different ways.

Further, in this discussion of *epistemic cultures* I also expand on the central feature of *topoi* that I have been repeating throughout this essay: that *topoi* structure, mediate, and organize one's experience of the world. Through Knorr-Cetina's work I show in more detail how *topoi* supply a framework or lens through which one sees the world (*structures*); how they act as conceptual filters through which one then makes sense of the world (*mediates*); and how they provide direction for further inquires and activities in the world (*organizes*).

Here, then, in the longest Section of the essay, I combine ideas from Anthropology, the Philosophy of Science, and Sociology of Science, to show how people are *both* brought up *and* trained and educated to see the world in specific ways. There is an over-arching cultural *topoi* that everyone is immersed in as a child, as well as specific and specialized *topoi* in which people actively enter and are trained and educated in as they grow older. This Section shows, then, how divergent peoples such the San of Southern Africa, the Dayak of Borneo, high energy physicists, and molecular biologists are all educated in particular ways of seeing the world, how this structures and directs how they see and experience the world, and how these are all equally valid and important ways of seeing and experiencing the world.

I begin with a quote from philosophy professor Friedel Weinert to re-emphasize how a *topoi* is structured and how *topoi* such as scientific theories change over time:

> Scientific theories operate under such constraints. With the exception of empirical constraints, these constrains form presuppositions. Presuppositions are fundamental assumptions, which, at least for the time being, are protected from critical inquiry. They are accepted as 'true.' They

> serve as historical a priori. They are not unquestionable but they remain unquestioned for certain periods of time. Whether true or false, they channel research into particular directions.[134]

When discussing Aristotle and E.V. Walter in the General Introduction, I stated that all *topoi* have boundaries which mark them off from the rest of daily, lived experience. This narrowing of perspective is in fact *the* fundamental aspect of *topoi* and without *topoi* we could never really 'stop' and make sense of the world around us. Each *topoi* is, in itself, a 'snapshot' attempting to catch and understand a certain aspect of reality, and it is guided by rules and standards which separate words and actions into the 'logical,' the 'illogical,' and the 'irrational.'

In the case of scientific theories, the boundaries that isolate the theory from the rest of reality are the constraints that Weinert highlights, both empirical and intellectual. The intellectual constraints he calls presuppositions and "*historical a priori*," and the empirical include the physical aspects of the universe that fundamentally exist and which cannot be contravened; physical realties such as those which preclude the building of a perpetual motion machine, or those which make it impossible for one to 'stop' natural processes and perform an isolated, static analysis of a small lake, for example. Consequently, scientific theories are based upon certain fundamental presuppositions and constraints that act as boundaries, and within these boundaries rules, norms, and standards of thought and behaviour emerge that guide how one is to speak and act within the *topoi.*

In this way a scientific theory is structurally analogous to other *topoi,* such as Kohak's collective monad with its "predetermined categories" through which the world enters, for the constraints of a theory stipulate how a scientist can think and 'act' when using a theory by stipulating what is 'allowed to enter'. In other words, the 'world' that the scientist sees when looking at it through a particular theory is only that world which enters through the presuppositions and historical a priori of the theory, and this is logically consequent on how a scientific theory is necessarily structured according to how thoughts, actions and phenomena come to be regarded as 'logical,' 'illogical,' or

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[134] Friedel Weinert, *Copernicus, Darwin, & Freud: Revolutions in the History and Philosophy of Science*, (Chichester: Wiley-Blackwell, 2009), 15.

'irrational.' As I show below when discussing the uncertainty principle in particle physics, because of these intellectual and empirical constraints there are certain thoughts/activities that a scientist either cannot or must have while working within the confines of a particular theory, and this is related both to the 'snapshot' aspect of *topoi* and how *topoi* structure, mediate, and organize how and what one sees in the world.

As such, a scientific theory functions similarly to *topoi* such as the Ku Klux Klan, an Anti-Social social club, and a church. Certain concepts bring people to these collectives and there are rules, norms, and standards that govern behaviour and which influence how people within each *topoi* experience the world. An observation that can be justified simply by pointing out that one is expected to speak and act differently within each of these 'places,' and thus one experiences a significantly different aspect of human social reality within the Ku Klux Klan – grouping together to hate a certain ethnicity – as compared to what one experiences in an Anti-Social social club – grouping together to be anti-social – as compared to what one experiences in a Church – grouping together to praise God.

The final two lines of my quotation from Weinert further highlight important ideas for my theory of the *topoi*: "*They are not unquestionable but they remain unquestioned for certain periods of time. Whether true or false, they channel research into particular directions*." The time element is key as it is related to the structure-behaviour dialectic and the idea that *topoi* change over time. As the world changes one's knowledge and perspective of the world must also change, and this change eventually necessitates new *topoi*: new ways of looking at the world, something which undoubtedly happens with scientific theories. As science and scientific theories hold such an unrivalled place in terms of knowledge and understanding in the modern world, if it can be more commonly understood that scientific theories operate as *topoi* and that they necessarily change over time, then it will be easier to understand that other *topoi* necessarily change over time as well, and consequently why it is perfectly natural that modern society needs to change how it is looking at the world today.

Lastly, the final words emphasize the directionality of *topoi*. How one looks at the world, the *topoi* that one uses to structure their experience of the world, holds an incomparable influence over how one then acts in the world, and this is seen in scientific theories in the way that "*they channel research into particular directions*." Put another

way, a scientific theory functions like a flashlight in the woods, pointing out and illuminating the route that a person will inevitably follow, as one rarely points a flashlight in one direction and walks in another.

I now expand the realm of *topoi* to the highest level, the inherited or the indoctrinated, by examining what I call the overarching cultural *topoi*. What I emphasize here is an important, though seemingly under-acknowledged, fact of human existence: that one cannot even take one's every day perceptions for granted without realizing that they too are implicated in a higher level of learned cognitive understanding. This is highlighted by E.V. Walter in the following statement from *Placeways*:

> Our 'common sense' assumes that eyes, ears, and other organs of perception register the world independently, without direct help from the rest of our experience. When we see an object with a certain form, color, and texture, the mind automatically registers 'tree.' If we pause to think about the 'critical tradition' in philosophy and psychology, we may recall that the thought, 'tree,' is what Kant called an 'intuition' that the mind associates with specific data received by the eye. However, the intuition – or whatever name you prefer to give the mental representation – is not a 'natural' psychological event but the complex product of social and civilizational processes. From infancy we are trained not only in what but also in how to see. We learn to build the world and the things in it by organizing selected fragments of experience. The sense organs arouse sensations, but the mind selects, sorts, combines, and builds them into the name-bearing, identifiable objects we know as things. Therefore, the obvious world is indeed a scheme of things.[135]

Walter highlights several important points here. First is the notion that "*we learn to build the world,"* that the world is not presented to one as pure phenomena and one is then free to make their own judgments and assertions about the world. Those who surround a person in their culture both deliberately and unconsciously teach and train others in what to select in the world, why this should be selected, and this is how all humans learn to build the world from selected entities around them. Deliberately *and* unconsciously because in *deliberately* pointing out and advancing ideas and teaching one what to select, they also *implicitly* pass on what they themselves have uncritically

[135] Walters, *Placeways,* 169.

accepted as part of their own cultural indoctrination. That is, because they *see* the world in the particular manner that has been taught to them, through the particular concepts and entities that allow the world to become 'the world' for them, they uncritically accept this as *that-which-is-the-case* in regard to how the world is to be organized and understood.

Consequently, when they then instruct others on what is important, on what to select in the world around them, they are implicitly stating the beliefs and values of the culture that has taught them what entities/phenomena are to be selected in the first place. For example, when an elder points out a certain type of tree, or a feature of a ceremony to a child, they are pointing out both a physical object/process in the world and an entity that this culture has 'selected' as it believes it to be in some sense important. This designation of importance is arrived at by the self-defining processes of cultural selection and it is due to this type of training and indoctrination that the child comes to "*[organize] selected fragments of experience*" into a "*scheme of things*," and by this process the world comes to be 'the world' for them.[136]

For Walter states that "*from infancy we are trained not only in what but also in how to see*," and this statement also nicely identifies the structural and mediational aspects of *topoi*. As a person is brought-up and trained to see 'the world' through the framework or lens of their cultural *topoi,* one is trained in *what* to see through the process of cultural selection. This then structures how one looks at the world and as one grows older and goes out into the world, it is through the mediating filter that is itself determined by *what* one is to see in the world that one comes to interpret, or 'make sense,' of 'the world' around them (*meditates*). In other words, entities and concepts which have been selected by one's cultural *topoi* come to be deemed important, and it is through these selected entities that one comes to see and experience 'the world.'

Walter then speaks of the "*complex product of social and civilizational processes*" that creates a person's "*mental representation*" of the world, and in stating this he is underlying the fact that as one is brought up within a specific culture, one which relies on past and present understandings of the world, one is necessarily taught how to see the

[136] *Gestalt* and how different people come to see the world so differently: "The sense organs arouse sensations, but the mind selects, sorts, combines, and builds them into the name-bearing, identifiable objects we know as things" (Walters, *Placeways,* 169).

world according to the dictates of this culture. The "*mental representation"* one has of objects and entities in the world is indeed the outcome of these processes. Therefore, an individual has no pure, objective experience of objects in this world, but sees and experiences objects in this world as they have been taught to see and experience them by their culture. This type of cultural indoctrination begins from the youngest age, and it becomes a person's chief way of making sense of the world. As such, the overarching cultural *topoi,* that which one largely takes for granted, which goes mostly unperceived, and which is uncritically accepted by everyone for at the very least a period of their lives, is the most important *topoi* in a person's life in terms of how a person ultimately *sees* the world.[137]

One's understanding and conception of the world is dependent upon how one is taught to organize their experience of the world, on what one has learned to acknowledge as important, and this is done through cultural indoctrination. As each culture differentiates itself from others through its conceptual foundations, rules, norms and standards of behaviour, each becomes what it is by emphasizing its own particular "*scheme of things*" over others.

An understanding of this cultural indoctrination is one of the great treasures Anthropology and Ethnography have given the world. From the Polish innovator Bronislaw Malinowski's (1884-1942) work with the Argonauts of the Pacific, to American complex systems analyst Stephen J. Lansing's (1942-) analysis of water systems in Bali, to the American anthropology pioneer Ruth Benedict (1887-1948) and her remarkable *Patterns of Culture*, to British medical anthropologist Margaret Lock's (1936-) comparative ethnological work on the body, illness and disease in North America and Japan, it is undeniably known today that different cultures of people are brought up and trained to see and experience the world in diverse and unique ways.

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[137] The most important, but not the only *topoi.* The clash of *topoi* is one of the most perplexing elements of modernity and is not limited to large, 'complex' societies like one sees in the West. In East Kalimantan I once enjoyed a four-hour Christmas Eve mass in a brand new church replete with electricity and other 'modern' conveniences, where there were breaks in the Christian portion of service to allow for traditional Dayak song and dancing. Here, then, are three *topoi* interacting in the same spatial and temporal space: the modern scientific, the Christian, and the Wehea Dayak. For a Wehea Dayak in the Church, where does one's true allegiance lie? Should they have true allegiances? What is to be done in a conflict between these different *topoi*? These are difficult questions people manage today.

Trained and indoctrinated to regard different objects as important; to select and concentrate attention on different elements and aspects of their surroundings; on who/what/when/where to worship and revere, and in a multitude of other ways, each culture creates and possesses a unique and incomparable vision of the world. People in different cultures are brought up in such a diversity of ways that they unmistakably see and experience the world differently. For to believe that a bird flying overhead looks and means the same thing to a member of an isolated tribe living in the Brazilian rainforest and a person trained and educated in a Westernized high-school is not laughable, it is lamentable. And to believe that one interpretation of such an event is in any way 'better' than another, is perhaps even more lamentable.

In complex societies such as those emerging throughout the world today, people are also trained how to see the world in more highly developed and technical *topoi*. As a result, different groups of people within the same society come to see the world from different perspectives. For example, a high-energy physicist comes to see the world as would a high-energy physicist, and a molecular biologist comes to see the world as would a molecular biologist. And while it may sound superficial, this is the same as saying that a San in Southern Africa sees the world as would a San, and a Dayak from the jungles of Borneo sees the world as would a Dayak (all of this echoing what I said previously about a Muslim seeing the world as would a Muslim, of course).

This is because all of these groups live and work in specific places, which are structured around specific concepts, that have them follow specific rules, which then lead to specific behaviours. As a result, each becomes a specific way of seeing and experiencing the world, incommensurable to how people see and experience the world in another place. For example, a Dayak from the interior of Borneo and a San from the parched deserts of Namibia would not be able to travel to one another's territory, taking their knowledge and understanding of 'the world' with them, and then understand how to see and experience 'the world' as the other does.

Similarly, the molecular biologist, trained for most of their adult lives in the methods and ideas of molecular biology, would simply not be able to prosper in a high-energy physics laboratory. This is because it takes much more to see the cause of a

clock's action than simply normal vision, open eyes, and a clock. All four of these places are diverse and demanding environments and knowing what to look for comes from being taught what to look for over time, and this training and education results in one coming to see the world in a particular manner.

To be trained and educated in such a *topoi* is to come to see the world through this particular *topoi*, and the *topoi* of the high energy physicist or the molecular biologist is just as real and influential as the cultural *topoi* of the San or the Dayak. They are all conceptual frameworks which determine how a person sees and experiences the world, and one can only truly understand how a member of such a *topoi* sees and experiences the world by being a member of such a *topoi*. Just try to imagine, for example, the upbringing, training and indoctrination involved in living and understanding material and phenomena in a parched desert, or in a tropical rainforest, or in attempting to see high-energy particle collisions or perform RNA and DNA splicing.

The paradox is that one cannot. For to see and imagine these worlds would be to instantly comprehend a multitude of particulars that at present none of us know to even exist (unless a person from one of these specific *topoi* happens to be reading this, which I doubt). And yet these 'non-existent' entities are precisely what structure the lives of all these different groups of people, this giving rise to the charming notion that what is non-existent in one realm constitutes the world in another.

All of these activities and entities are connected to their own specific *topoi*, to their own particular way of framing one's experience and of organizing reality, and to their own particular place. As such they can only be understood by coming to see the world in their own very distinct and particular ways, in their own very distinct and particular places. No matter how hard I try, I simply *cannot* see and experience the world as does a Dayak forester, a San bushman, a high-energy physicist, or a molecular biologist.

Each *topoi* is unique, it is self-referential, and it can only be judged from within the *topoi* itself. This is because as one cannot personally experience all these ways of seeing the world, one cannot know them; and if one cannot know them, how can one judge them? One can therefore only judge them by standards set within their own dominant *topoi,* and thus to judge them is to judge them by standards outside the *topoi*

in question. To do this is to judge what one does not know based upon what one does know. It is to judge an entity based entirely on one's own standards, and just by attempting this one comes to act absolutist and idealist by assuming that one *topoi* is somehow better than another, that one way of seeing and experiencing the world is superior to another, and consequently this type of judgment is nothing more than a presupposition of the particular way in which one is looking at the world.

Karin Knorr-Cetina expands on scientific ways of seeing and experiencing the world in *Epistemic Cultures: How the Sciences Make Knowledge*, an inquiry into how people are taught to see in specific ways and how this structures how one then views phenomena and comprehends the world. She presents her ideas through highlighting the several years she spent doing field research with high-energy physicists at CERN and with molecular biologists in several locations throughout Germany, including the Max Planck Institute in Berlin, and the result is a penetrating look into the specific conceptual frameworks used by scientific communities, the eponymous *epistemic cultures*.

Her opening words provide a definition: "Epistemic cultures," says Knorr-Cetina, "are those amalgams of arrangements and mechanisms – bonded through affinity, necessity, and historical coincidence – which, in a given field, make up how we know what we know. Epistemic cultures are cultures that create and warrant knowledge."[138] The book expands on this concept through an analysis of how high-energy physicists and molecular biologists perform their research, and through this analysis Knorr-Cetina is able to highlight exactly how an epistemic culture functions. Eventually readers are able to see much more clearly how an epistemic culture is a distinct collective made up of networks, theorems, procedures, and presuppositions that result in a specific way of seeing phenomena in the world. Consequently, while reading her book I came to realize that there exist clear similarities between epistemic cultures and *topoi,* and so what I

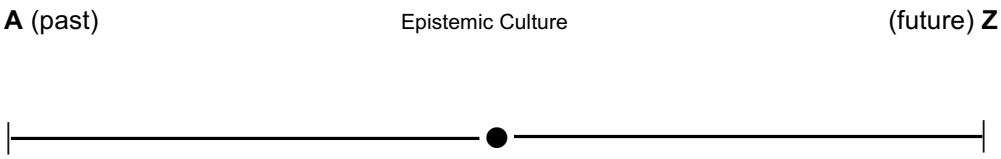
[138] Karin Knorr-Cetina, *Epistemic Cultures: How the Sciences Make Knowledge*, (Cambridge, MA: Harvard University Press, 2003), 1; The most famous example of an epistemic culture from Anthropology is likely E. E. Evans-Pritchard's classic study *Witchcraft, Oracles, and Magic among the Azande* (1937).

would like to do is use her analysis to highlight how it is that epistemic cultures likewise structure, mediate, and organize what one sees and experiences in the world.

An epistemic culture functions as a *topoi* in the following manner: (1) it is used as a framework or lens through which a member of the culture views the world and in which the knowledge of the field is based (*structures*); (2) it functions as a conceptual filter through which entities and phenomena in the world, including scientific research, become comprehensible to practitioners (*mediates*); and (3) it functions as a conceptual network through which all future research in the field is based upon (*organizes*).

An epistemic culture is a framework that a scientist views the world through and which they must accept in order to do research in a particular field. One cannot be a molecular biologist and wholly reject the epistemic culture of molecular biology. An epistemic culture is composed of "*amalgams of arrangements and mechanisms,*" something which corresponds to the central concepts, presuppositions, and rules, norms and standards of my *topoi*. They rely on past research in that which has been postulated as *that-which-is-the-case* as well as on "*historical coincidence,*" and thus they are based upon and guided by what Weinert earlier called the "historical a priori" of scientific theories. In other words, an epistemic culture acts as a lens through which a scientist sees and understands the world, as a conceptual filter through which phenomena observed in the world is comprehended, and as a focal point, though now greatly expanded into an entire framework or network, from which future research is based upon. In sum, an epistemic culture functions so that *what is observed by the scientist in the course of their research is given its meaning by its relation to the overall framework of the epistemic culture.*

To make this a bit clearer, I provide a rather sparse, though I believe useful, spatial/temporal diagram. The heart of the epistemic culture, so to speak, is the dot in the middle, and this incorporates everything that has been accepted by the community as *that-which-is-the-case* in the past (A), and it looks into the future by directing subsequent research (Z).



The directionality aspect (*organizes*) is shown in that where you begin, the dot in the middle, very much dictates where you will 'end up.' The conceptual filtering (*mediates*) in that all phenomena are viewed through the "predetermined categories" which all epistemic cultures are structured upon, and phenomena seen in the world must come to make sense *in terms of* these predetermined categories, just as future research must be *directed by* these predetermined categories. The overall framework or lens (*structures*) is shown by the entire diagram taken together: this is the 'snapshot' aspect of the *topoi*, as when it is viewed as a distinct totality it highlights how all that falls outside of (A), the black dot, and (Z) is essentially 'left-out' of this particular way of looking at the world.

I further develop these ideas by looking at how Norwood Russell Hanson explains the famous uncertainty concept in *Patterns of Discovery*:[139]

> There are plenty of technical obstacles for the quantum physicist to hurdle: most of these he [sic] attacks from within the conceptual framework of the theory. The uncertainty principle is no such obstacle, for it is built into the outlook of the quantum physicist, into every observation of every fruitful experiment since 1925. The facts recorded in the last thirty years of physics are unintelligible except against this conceptual backdrop. One cannot maintain a quantum-theoretic position and still aspire for the day when the difficulties of the uncertainty relations will have been overcome. This would be like playing chess and yet hoping for the day when the difficulties of possessing but one king will have been overcome. To hold a quantum-theoretic position just is to accept the relations as unavoidable.[140]

Uncertainty is part of the epistemic culture of particle physics in that it is part of the framework in which the rest of quantum physics becomes and remains intelligible. It is a foundational part of the epistemic culture's conceptual framework and as such one

[139] In what follows, particle physics, quantum physics, quantum mechanics, microphysics and high-energy physics are all synonymous terms denoting the same field of study.

[140] Hanson, *Patterns of Discovery*, 149.

simply cannot 'do' particle physics without accepting uncertainty.[141] To put it in terms of the diagram, it is within the black dot of particle physics as it is accepted as *that-which-is-the-case* from the past (A), and it looks forward to the future (Z) in that all future research within particle physics must take place in light of uncertainty. However, I can elaborate in greater detail.

Structure: Uncertainty is not a problem as identified in Section II, as something unseen and lurking in the shadows of the discipline waiting to be solved. While especially naïve physicists and philosophers might believe this and wait for the day this uncertainty is overcome, it is not a matter of better technology, more research, or ignoring it. Uncertainty is a core feature of particle physics and the uncertainty principle could be overthrown only through a complete overhaul of the entire conceptual framework of particle physics. Uncertainty, therefore, structures particle physics by being an integral part of the lens/framework through which particle physicists see the world, and in this manner it dictates *what* the particle physicist sees when they look at the world. To turn this around, when particle physicists look at the world, *what* they *see* is uncertainty.

Mediate: With uncertainty structuring *what* particles physicists see when they look at phenomena, they subsequently view phenomena in light of uncertainty being a fundamental reality. That is, uncertainty has to be accounted for and accepted as valid in all experiments, research and when viewing phenomena, and this is how uncertainty mediates particle physicists seeing and experiencing the world. It guides them in a similar manner to the directionality (*organizing*) aspect of *topoi* by being a 'light,' but while the directionality aspect is predominantly for future research/proposals, etc., the mediational aspect is largely for phenomena being viewed *in the moment*; uncertainty mediates *how* phenomena directly in front of the physicist appears in the world and it is through this mediation that phenomena comes to 'make sense' to the particle physicist. Physicists see phenomena in the world *in light* of uncertainty.

[141] Knorr-Cetina includes an interesting case in her book of physicists at CERN viewing experiments that increase the cases of uncertainty as being *an advance in their knowledge.* It is very interesting that high energy physics now face situations where an increase in uncertainty is *celebrated* as an increase in knowledge. See Chapter 3: "Particle Physics and Negative Knowledge," for more.

Organize: Particle physicists theorize taking uncertainty as a given. This is the sense in which uncertainty is used as a guiding 'light' to organize what they see in the world, and therefore they do not attempt experiments assuming uncertainty does not hold, as this would falsify their experiments from the beginning. This would be ignoring *that-which-is-the-case* in particle physics and by disregarding it as unimportant or invalid it would send the particle physicist in the wrong direction. To do research in particle physics, therefore, is to do it with the 'light' of uncertainty guiding the way, and thus uncertainty organizes and directs how particle physicists see and experience the world.

I quoted E.V. Walter earlier regarding his learned "*scheme of things*" that structures, organizes, and mediates how an individual experiences the world through their culture (pp. 123). This scheme of things is analogous to an epistemic culture as neither the particle physicist nor the molecular biologist look at phenomena directly, but they look at it in light of and through their epistemic culture. They are not, in other words, seeing *pure, objective empirical phenomena*, but they are seeing empirical phenomena in light of and through the dense web of presuppositions and accumulated knowledge that makes up their epistemic culture. And, crucially, it is only through this dense web that high-energy physicists and molecular biologists are able to 'make sense' of phenomena and by which entities come to have meaning.

The importance of this, to come back to the self-referential aspect of the *topoistic* perspective, the paradigm observer, and seeing that which is hidden, is two-fold. First, anyone not trained in such a culture will necessarily not be able to see phenomena that the specialist claims to see because they are not able to see the world in the same manner as the specialist trained in this epistemic culture.[142] This is further related to why it is impossible to judge a *topoi* except on its own terms, why one cannot use the terms, concepts, and presuppositions of one *topoi* in judging another, because unless one has been trained or brought up in this *topoi,* one simply cannot *know* it and thus any standards of judgement used between *topoi* are largely incommensurable (more on this below). Second, as an epistemic culture becomes the lens through which a person views

[142] And the difficulty here is that everyone, the San, the Dayak, the physicist and the biologist, are brought up and trained in highly specific ways of seeing the world. Hence difficulties arise in communicating between people like Richard Dawkins and Pope Francis as they simply do not see and experience the world in the same way. They *see* different entities in the world, entities that they have both be taught and come to believe truly exist, and their ways of seeing the world are entirely self-referential and incommensurable.

the world, any phenomena that falls outside of this lens *will be unintelligible* as an epistemic culture teaches and trains its members what to select – what to look for and what to focus on – and one cannot *select beforehand what one does not know is there*.

This type of training and education, in other words, results in 'blind spots' where phenomena fail to 'register' for the observer because not everything can be selected as not everything can be included in a single *topoi* and hence come to have *meaning.* Only that which falls within the *topoi* can be meaningful, and as the identification of a problem necessitates recognizing that which is hidden, and as that which is hidden must *necessarily* be non-meaningful for the *topoi* observer as it falls outside of the *topoi,* this type of training and education effectively results in training ourselves to be unable to see that which is truly significant, that which is hidden.[143]

This potential blinding through training and education can be highlighted by cases of scientists/thinkers trained in one epistemic culture entering another and making some of the largest discoveries in the field. Possibly because they are able to look at the material free from the learned presuppositions of the discipline and see matters differently, they are able to see *that-which-is-the-case* while those trained and reared in the discipline are unable to. Francis Crick (1916-2004) and James Watson (1928-) both came from physics backgrounds and were working in the Cavendish Laboratory at Cambridge before they discovered the structure of DNA; the political scientist Elinor Ostrom (1933-2012) spent a career studying commons resources and their governance and her pioneering work earned her the Nobel Memorial Prize in Economics in 2009; and American physicist Thomas Kuhn (1922-1996) – most fitting for this study, perhaps – was not even a philosopher of science, the field in which he made his greatest impact. Philosopher and writer James Marcum writes:

> In terms of philosophy of science, Kuhn admitted that he had an 'everyday image of logical positivism,' meaning that he had not read or was trained

[143] What is *significant* follows the same sequence as what makes a *judgement* a *judgement*. If the issue at stake were plain, reasonable and straightforward, a judgement would not be required. But as something which requires a judgement simply does not fall within this sphere, something like a judgment is needed. This same logic works with the idea of significance. To be significant in the sense I am using it something must be out of the ordinary. To be out of the ordinary it must come from outside the received view. If something is straightforward and easily noticed it necessarily is not significant, as not everything can be significant, and because significance must come from somewhere. It comes from being unseen, not noticed, hence being out of the ordinary in such a way as to be judged as significant, once it is noticed.

> extensively in it. When critics charged him with philosophical naiveté, they failed to appreciate Kuhn's amateur status in the field. He was self-taught, as he openly acknowledged. If Kuhn had studied extensively the philosophy of science literature, 'I probably would never have written *Structure*.' *He was an amateur but that status often permitted him to cross disciplinary boundaries, which otherwise could not be traversed by those who are indoctrinated through oppressive dogmas and confined by restrictive boundaries*[144] (emphasis added).

Hence the double-edged sword that is *topoi*-specific training when it comes to specialized areas of study and their specific and highly technical epistemic cultures. To go back to Darwin, one becomes so engrained in viewing the world in a particular way that one can become unable to *see* anything else. And the resultant rigidity of such a perspectival solipsism, can result in the inability to adapt and see phenomena from another perspective, one of the most pernicious habits a person, a community, or a society can adopt.

For there is a world of difference between looking at a stick as an object that has fallen from a tree, and seeing in it an entity that can be used to spear fish. But there is also a world of difference between believing that the stick can only be used to spear fish, and understanding that it can also be used to make baskets, set traps, and protect gardens.[145] To remain too engrossed in a single *topoi,* in a single way of looking at the world and at phenomena, can result in a person being blind to a much broader, much richer array of phenomena. As such, any homogenizing, overarching method/*topoi* is something one should be wary of; cautious of adopting, even more cautious of embracing.

To come back, them, to the notion of incommensurability, Knorr-Cetina highlights that the methods, ideas, and procedures of one epistemic culture are strictly non-transferable to other realms of inquiry. In other words, one cannot 'do' high-energy

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[144] James A. Marcum, *Thomas Kuhn's Revolution: A Historical and Evolutionary Philosophy of Science?* (London: Bloomsbury, 2015), 27.

[145] High energy physicists and molecular biologists are still going to be the ones most likely to make a fundamental breakthrough in their fields, as compared to, for example, me. There has to be a recognition and cognizance of the field, especially in such a specialized area, to see *that-which-is-the-case.* Those outlined here were obviously familiar enough with the epistemic cultures of their adopted fields, but what I want to highlight is that they were not in their intellectual 'homes,' so to speak.

physics with the framework, methods and mentality of molecular biology. She makes this incommensurability clear in comparing the methodologies of her two epistemic cultures, showing exactly why there can be no such appropriation, and while the language may be a touch dense, the incommensurability of the two can be gleaned from passages such as the following:

> It is important to realize that molecular biology's preference for blind variation and natural selection by no means implies that this method is any less effective than physics' care of the self and negative epistemics. In fact, molecular biology, by all standards, has been very successful in the last 20-30 years, and seems bent on remaining successful in the foreseeable future…[Furthermore] biochemical reactions, as used in experiments, are not formulated mathematically and, hence, cannot be calculated in the way the reactions in a detector can be computed. Thus, for molecular biology to behave like experimental HEP [High Energy Physics], many components of its system would have to change in synchrony with other components. In other words, it would involve a change of the whole epistemic culture.[146]

Related to this methodological incommensurability, reading Knorr-Cetina's analysis one begins to understand how each group approaches phenomena and organizes its inquiries, and this understanding puts to rest the notion that there exists a single Scientific Method for all to follow. Though the overall goal of knowledge and understanding may be the same within the two epistemic cultures (as they both fall within the over-arching *topoi* of Science), the methods and conceptual frameworks used for the accumulation of knowledge and for understanding in each differ so greatly as to be not only incommensurable, but, as the above quote highlights, methodologically and conceptually distinct. Therefore, while both are oriented towards knowledge and understanding there exists great differences between the methods and concepts used to arrive at this knowledge and understanding.

In *Epistemic Cultures* Knorr-Cetina describes the varied and diverse ways of knowing in what she calls a "knowledge society": a society which "is not simply a society of more experts, more technological gadgets, more specialist interpretations. It is a society permeated with knowledge cultures, the whole set of structures and mechanisms

[146] Knorr-Cetina, *Epistemic Cultures,* 93.

that serve knowledge and unfold with its articulation."[147] In other words, a knowledge society is a society which is complex, diversified, and specialized enough to have many different epistemic cultures. In closing this Section, then, I elaborate on the plurality of *topoi* and highlight that this important aspect of modernity is one of the main reasons why a *topoistic* perspective is so crucial today.

For in addition to the increasing number of *topoi* present in knowledge societies, nations and peoples all over the world today are adopting a dominant, homogenizing *topoi,* and this homogenization is subsequently causing the fragmentation into an increasing number of smaller *topoi* within human collectives, possibly as people search for ways to cope with the homogenizer. Consequently, there is the curious situation today whereby there is both *topoistic* homogenization and *topoistic* fragmentation as people begin to structure and organize their lives both in the same, and in radially different ways. Importantly, as *topoi* increase, split, and superimpose, they overlap and 'crash into' one another, and this can be the cause of great social and political difficulties.

Furthermore, this superimposition and overlapping of *topoi* highlights how the dominant, isolationist, and linear *topoi* is unable to cope with the complexities of modern societies. An example: when *topoi* interact and someone states an idea or opinion, to another person looking at it from a rationalized, linear perspective it may seem like a contradiction and hence be classified as a poor opinion/idea. However, to the thinker able to look at the world from a *topoistic* perspective, they will perhaps see that two *topoi* are over-lapping and 'bumping into' one another, and instead of rejecting the idea, they recognize that it is actually a very good idea, just subsumed under multiple *topoi,* and that perhaps it is the linear, white/black, yes/no mentality that should be rejected instead. For the thinker in this case might very well be contradicting themselves on one level, but when the analysis is deepened and taken to another level, it may turn out that the contradiction is simply the result of two *topoi* interacting with one another.

Take the example of John Locke (1632-1704). Locke was a genius who wrote two hugely influential books in epistemology/psychology and political theory. However, there was a problem in reconciling his beliefs in the two books and this presented quite

[147] Ibid., 8.

real difficulties for Locke. Locke scholar Peter Laslett comments on this in the introduction to the Cambridge University Press edition of *Two Treatises of Government*: "As Dr. Von Leyden has shown, these earlier essays would not have provided a doctrine of natural law capable of reconciling the theory of knowledge in Locke's *Essay* with the ethical doctrine of that work and of *Two Treatises.* This, it is suggested, may have been one of the reasons why Locke was unwilling to be known as the author of both books."[148] That is, Locke may have wished not to be known as the author of one of the most influential books ever written, because his conception of Natural Law and his theory of knowledge in this and another of his works did not logically and rationally accord with one another.

And while this type of thinking may be a problem on one level (evidently John Locke's), once one looks from a *topoistic* perspective and learns to deepen their analysis and understand that different realms just might not be logically coherent with one another, it is not so much a problem: it becomes more of a vindication of the ineffable complexity of human social life and the poverty of the prevailing, guiding *topoi*. As the world grows more *topoistically* complex individuals come to see the world through more than one *topoi*, and therefore it becomes much more likely that most individuals will hold opinions and beliefs that contradict one another. And this is perfectly acceptable.

For nothing in all of this takes away from the brilliance of Locke's two works, contradictory or not; and when one looks from the *topoistic* perspective one easily sees that the books are in two *essentially dissimilar* realms of material/phenomena, and therefore they should not necessarily be expected to logically cohere. Consequently, Locke's linear, reductionist, isolationist mentality that believes otherwise, faces the same criticism that was levelled at Galileo, Descartes, and Newton in Section I: it is an idealization. Locke was guilty of believing that all should necessarily follow the dictates of human reason and rationality, and for this reason he and others rejected what should

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[148] Peter Laslett, introduction to *Two Treatises of Government,* by John Locke (Cambridge: Cambridge University Press, 1988), 82. Laslett, apparently to add more emphasis, adds the following in a footnote on the same page (for those, unlike myself, who can understand this): "The trouble was that Locke based right and wrong on God's commands and punishments, but also adopted a hedonistic ethic as well, an ethic of the Hobbesian sort. Meanwhile he passionately believed in the possibility of demonstrating ethics mathematically, though he was perpetually complicating everything with his anthropological relativism, noting the variety of ethical values among the world's peoples and hinting that virtue and vice were simply customary."

not have been a concern. Thus slaves to their methodologies and incapable of looking beyond, they allowed their mentality to dictate their world, as all *topoi* necessarily do.[149]

When phenomena appear too complicated to be dealt with by a particular method, by a particular way of looking at the world, this does not make the phenomena disposable as 'contradiction' or 'non-sensical.' Ideas, phenomena, entities thus rejected could be well-beyond the 'non-sensical' or the 'contradictory,' in fact, they could brilliant ideas – *they could very well be that which is significant, that which is hidden* – just submerged under several levels of seemingly competing *topoi* and thus undetectable by current methods. For as I have shown time and again in this essay, if one has the wrong perspective to begin with one will necessarily be unable to see *that-which-is-the-case* (directionality).

My perspective is supported by American literary theorist Caroline Levine in her 2015 publication *Forms: Whole, Rhythm, Hierarchy, Network.* In this work Levine takes a formalist view of the nested and recurring forms within a society, how these forms interact with one another, and presents an analysis similar to that expressed here. For example, she writes: "In theory, political forms impose their order on our lives, putting us in our places. But in practice, we encounter so many forms that even in the most ordinary daily experience they add up to a complex environment composed of multiple and conflicting modes of organization – forms arranging and containing us, yes, but also competing and colliding and rerouting one another."[150]

For Levine, then, political 'forms' are organizational forces that have traditionally 'put one in their place,' so to speak. If one were a Liberal and another a Marxist, "*political forms arranging and containing,*" then living, arguing, debating, etc. would be a relatively straight-forward affair as both parties, due to their formal categorization as either Liberal or Marxist, should predominantly adhere to the principles, ideas, and values of their perspective, and this would govern both their words and their actions – analogous, in a way, to Aristotle's dialectical commonplaces outlined in the General Introduction and how arguments are meant to take place according to his categorization.

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[149] The question becomes, to paraphrase the Buddha again in my own particular language, 'what *topoi* does one want to see the world through?'

[150] Caroline Levine, *Forms: Whole, Rhythm, Hierarchy, Network*, (Princeton: Princeton University Press, 2015),16.

However, Levine posits that there is a much more complicated reality today due to the "*competing and colliding and rerouting*" of forms, and this raises significant issues for this former categorization of political forms. The formerly reified boundaries that separated the Liberal from the Marxist are no longer so absolute, and the deeper one gets into this menagerie of forms, this "*complex environment composed of conflicting modes of organization*," the more one can realize that one is in fact both a Liberal and a Marxist – it just depends on the question and the context.

Consequently, when one wonders at the complexity of the world and the seemingly intractable nature of so many current social and political issues, a *topoistic* or formalist perspective can be helpful. By pointing out that many different *topoi,* or forms, exist in the world, that these are foundational in structuring people's experience on so many different levels, and that the old methods and old ways of looking at the world are incapable of coping with this complexity, coming to see the world in such a *topoistic* way can become central as one strives for that which remains hidden.

Section IV – Interdisciplinary Appropriation, and the *Topoi* of Paradigm Shifts

This Section is in many ways a direct continuation of the last. There I examined the span of *topoi,* Science, *topoistic* incommensurability and self-referentiality, and how *topoi* structure people's lives. Here I continue with many of these ideas, focusing again on Science, something for which I have another motive as well. I would like to alleviate any tension that may have arisen due to my emphasis on the natural sciences in this Chapter, after having stated repeatedly that social scientists must be careful they are not appropriating methods and frameworks from the natural sciences in framing hypotheses about the social world. Here I explain and justify my use of such sources so as to free myself from any suggestion that I, too, am guilty of interdisciplinary appropriation.

I then continue on to the man who likely figures in this essay more than any other, the physicist and historian of science Thomas Kuhn (1922-1966). However, as in the Darwin Chapter, instead of looking directly at Kuhn's work, I use Kuhn and his concept of the *paradigm shift* to focus again on interdisciplinary appropriation and to provide another example of how *topoi* actively shape how one sees the world. I call this the '*topoi of the paradigm shift*' and in exploring it I further emphasize how people come to see the world through specific conceptual frameworks, and re-affirm my contention that social scientists must think originally and not restrict their intellectual abilities by being overly-reliant on methods, ideas, and frameworks from disparate disciplines in attempting to understand the social world.

Karin Knorr-Cetina writes in the opening paragraph of *Epistemic Cultures,* "Epistemic cultures are cultures that create and warrant knowledge, and the premier knowledge institution throughout the world is, still, science."[151] As my essay is primarily concerned with epistemology and how different groups of people come to know the world, I, as Knorr-Cetina illuminates, would be remiss if I did not include Science here. However, this is not the only reason why Science figures so prominently in these pages. There are, in fact, several:

[151] Knorr-Cetina, *Epistemic cultures,* 1.

(1) Science and scientific theories are *topoi.* Therefore, including a discussion/exploration of them enriches the present study.

(2) Science operates as a microcosm of the second aspect of the *topoistic* perspective, namely: *topoi* operate from the level of the large down to the small, and each functions independently in structuring, mediating, and organizing one's experience of the world.

(3) Scientific theories, like all *topoi,* change over time. This highlights the first aspect of the *topoistic* perspective, the structure-behaviour dialectic, and shows that as the world is continually changing so too must theories and views of the world occasionally change. This also shows that because science holds such a commanding position in the world in regard to knowledge and truth, if scientific theories are of a fluid nature and change over time, then other *topoi* likewise change over time.

(4) When a change in *topoi* occurs within science, what Kuhn famously called a *paradigm shift*, these are not straight-forward affairs. Convincing people to see the world in a new light, as is what must occur in a shift of *topoi,* is remarkably difficult both within the natural sciences and elsewhere. Incredible discoveries which instantly change how everyone views the world do not exist, and this is because all people see the world through conceptual lenses and thus changes are gradual and take time. Consequently, when it comes to being the paradigm observer, both in science and without, the challenges involved just '*to-be-heard*' are remarkably similar.

(5) Science and the history of science hold a distinct advantage over other disciplines in regard to this type of *topoistic*-shifting inquiry. The American anthropologist Anthony Wallace (1923-2015) outlined this in an article published in the journal *American Anthropologist* in 1972, where he explains why it is that paradigm shifts are so well documented in science and technology as opposed to other disciplines:

> The examples so far cited have tended to lay emphasis on largely scientific and technological cores, with occasional reference to theology and the arts. Perhaps such 'hard' domains attract attention because problems can here be phrased in relatively formal, and therefore finite and solvable, terms. It may be that the aesthetic urge which in part prompts the process of core development is best satisfied in working with systems that permit highly structured, cumulative thinking.[152]

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[152] Anthony F. C. Wallace, and Robert Steven Grumet, *Revitalizations and Mazeways: Essays on Culture Change*, (Lincoln: University of Nebraska Press, 2003), 83; The quote continues on and highlight problems associated with the '*to-be-heard'* hurdle: "But paradigmatic thinking itself does not necessarily address itself to the practical problems of the world; it may appear, to those outside the paradigmatic community, that it is a domain of trivialities, a menagerie of hair-splitting pedants, cranks, and ivory-tower types whose preoccupations are irrelevant to the 'real' world. Irrelevant,

Anthony Wallace became well-known in Anthropology circles for his *revitalization movement* hypothesis (topic of the next Section). According to Wallace, a revitalization movement is a *topoi*-shifting event – an event in which people come to see the world from a new perspective – and in this quote he explains why it is that studies related to the natural sciences are so predominant in the literature on such shifts.[153]

The reasons, as Wallace highlights, are quite straight-forward, but can be expanded upon. Arguments, concepts, and notations in the natural sciences and technology are accompanied by 'breaks' that are cleaner, more obvious, and more verifiable and explicable than they are in the social sciences, and this fundamentally extends from the nature of the subject matter and its concomitant methodologies. As the natural sciences deal more specifically with concepts amenable to mathematical definition and demonstration, they gain a level of clarity and authority that makes dissension difficult, and which also makes it is easier to identify when a *paradigm shift* has occurred in these disciplines

American philosopher E.A Burtt helps to clarify these ideas by illustrating how Newton's *Principia* changed how people approached phenomena: "He not only found a precise mathematical use for concepts like force, mass, inertia; he gave new meanings to the old terms space, time, and motion, which had hitherto been unimportant but were now becoming the fundamental categories of men's [sic] thinking."[154] Therefore, when Newton reconceptualised the physical world as he did in the *Principia,* he did it mathematically, and this mathematical demonstration allowed him to re-define terms and concepts in a fundamentally new way, making his new conceptual world both very recognizable and almost impossible to argue against. After Newton one was either

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that is, until the paradigm has been developed to a point where one of its aspects presents a means for solving someone's practical problem." When a new *topoi* is put forth people are simply unable to understand it and so they reject it. However, if the idea turns out to be a good one, if it turns out to be *that-which-is-the-case,* then as the saying goes: first they reject it, then they praise it, then they appropriate it.

[153] Wallace uses the term *paradigm shift* frequently in his work, and while I wished not to use this phrase in my essay, by incorporating Wallace and then doing more research, as will become obvious below, it became impossible to keep it out. See footnote 161, as well.

[154] E.A. Burtt, *Metaphysical Foundations of Science*, 33.

speaking in Newtonian terms, or one was speaking against them, and the clarity that accompanied this conceptual shift makes it much easier to definitively *see* the event.

Compare this with a slightly earlier event, the Protestant Reformation, and one's analysis becomes much 'fuzzier.' One can easily find the important dates and the major figures involved, the core concepts that were debated and discussed, but even the handful of trained historians and theologians who spend their lives studying the event remain without the clarity and exactness to which scholars of the Newtonian Revolution are endowed. One knows for certain that the Protestant Reformation happened, just as one knows for certain that the Newtonian Revolution happened, but one can see in a much crisper, cleaner manner quite precisely when the latter occurred and the important details involved, and this is largely due to the immediate conceptual impact that it had on those who followed, and on the nature of the subject matter at hand.[155]

For such reasons a paradigm shift is more easily observed in the natural sciences than it is in Anthropology or Theology, and this is largely why, as Wallace suggests, so many of the studies regarding paradigm shifts initially came from technology and the natural sciences. It is also a primary reason why so many of the sources I cite in this Chapter are themselves concerned with the natural sciences.

However, that many of my sources are *concerned with* the natural sciences should not disarm the reader, as the works I refer to and cite most frequently in this Chapter are works of philosophy, not works of science. They are indeed about science and draw much of their expository material and resources from science, but they are not *science* books in that they are not dependent upon and/or framed around theories, methods and ideas from the natural sciences in shaping their hypotheses; nor are they offering science and its methods and ideas as guides for Philosophy, History, Sociology, or any other Social Sciences.

The full title of Hanson's book is *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science*; Polanyi's is *Personal Knowledge: Towards a Post-Critical Philosophy;* Burtt's *The Metaphysical Foundations of Modern Science*; and Karin

[155] It also, as the final sentence of Wallace's quote outlines, has to do with the nature of the system in question, open or closed, ideas discussed in Section II with the Clockmaker and the Paradigm Observer levels.

Cetina-Knorr's *Epistemic Cultures: How the Sciences Make Knowledge*. And as for Kuhn? He was indeed trained as a physicist, but *The Structure of Scientific Revolutions* is an historical and philosophical essay. It deals overwhelmingly with conceptual matters within the natural sciences, not strictly empirical, physical matters, and conceptual matters are, by their very nature, not reducible to the methodology or mentality of modern physical science.[156]

Kuhn is responsible for bringing the term 'paradigm shift' to such prominence with the publication of his 1962 essay *The Structure of Scientific Revolutions*. And while it was initially my desire not to use Kuhn nor the phrase in this essay, as the essay developed this desire shifted to the point where it would have been impossible to keep Kuhn out. For in doing my research I found that not only were there several thinkers before Kuhn, but also several of his contemporaries were engaged with the same concept(s), and in realizing this I came to recognize that there exists a *topoi of the paradigm shift.*

Of the books already cited, Norwood Russell Hanson's *Patterns of Discovery* (1958) and Michael Polanyi's *Personal Knowledge* (1958) use the term paradigm throughout, and I found it much more openly and conspicuously used by British philosopher Stephen Toulmin in a 1961 lecture series given at Indiana University called *Foresight and Understanding*. For example, in the second of Toulmin's lectures, he uses distinctly Kuhnian language when describing the overthrow of Aristotle's theory of motion by the Galilean:

> No wonder that the replacement of one ideal of natural motion by another represents so profound a change in dynamics. Men who accept different ideals and paradigms really have no common theoretical terms in which to discuss their problems fruitfully. They will not even have the same problem: events which are 'phenomena' in one man's eyes will be passed over by the other as 'perfectly natural.' These ideals have something 'absolute'

[156] When I tell people about this essay they almost always mention Thomas Kuhn and French philosopher Michel Foucault (1926-1984). I have opted out of including anything in regard to Foucault, but his *The Archaeology of Knowledge* (1969) may express similar ideas to those presented here. I have not read it. I have read Kuhn, but my only reading of his work occurred five years ago and I did not revisit his essay at any time while writing this essay.

about them, like the 'basic presuppositions' of science about which R.G. Collingwood wrote.[157]

I state that Toulmin's language here is 'commonly acknowledged' as 'Kuhnian' and this is due to the fame attached to Kuhn and the ideas Toulmin here postulates. For if the above excerpt were given to a random sample of Science, Social Science, and Humanities students and they were asked to name the author, I believe it is safe to assume that an overwhelming majority would say 'Thomas Kuhn,' while perhaps next to none would say 'Stephen Toulmin.' Of course, anyone who has read and understands Kuhn's essay will easily spot the parallels with the manner in which Toulmin writes and with the ideas he expresses here, but it is unlikely that many will state that it is Toulmin writing and not Kuhn. However, these lectures were actually delivered before *The Structure of Scientific Revolutions* was published, and this shows that these ideas were evidently not Kuhn's alone.[158]

This supposition of mine was later validated when I read the following in James A. Marcum's, *Thomas Kuhn's Revolution: A Historical and Evolutionary Philosophy of Science?*: "Although the paradigm concept was not original with Kuhn – philosophers Georg Lichtenberg, Wittgenstein, and Toulmin used it earlier – Kuhn certainly made it popular."[159] Add to Marcum's list R.G. Collingwood, Michael Polanyi, Norwood Russell Hanson and, perhaps more importantly since it came from a discipline outside of the history and philosophy of science, Anthony Wallace and his "Revitalization Movements" paper from 1956, and one sees that these ideas were not birthed by Thomas Kuhn alone. Indeed, they had been 'in the air' for some time before Kuhn published his now famous essay.

Post-Kuhn, the essay and the phrase have been wildly popular, effectively spawning their own sub-industry of social scientists and others all postulating on the ubiquity of paradigm shifts. This makes it appear as if once people read and digested

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[157] Stephen Toulmin, *Foresight and Understanding: An enquiry into the aims of Science*, (London: Hutchinson & Co., 1961), 57; R.G. Collingwood was an English philosopher (1889-1943).

[158] However, Marcum also shows that Kuhn had indeed been presenting these ideas for some time, starting with the Lowell Lectures at the Boston public library in 1951 (Marcum, *Kuhn's Revolutions,* 32-36).

[159] Marcum, *Kuhn's Revolution,* 176-77.

Kuhn's work, the *topoi of the paradigm shift* arose with its own conceptual foundations and central ideas as people suddenly started to '*see'* these same concepts and structures everywhere. Take, for example, this statement from Marcum, quoting the British sociologist Nick Perry: "For some students of economics, international relations, political science, normative political theory, organization theory, psychology, sociology, geography, art history and religion, the master is Thomas Kuhn. *They have claimed to detect parallels between his account of science and developments in their own subject areas*"[160] (emphasis added).

Beyond this web of academic mimesis, it is not to exaggerate to say that the term paradigm shift and its associated connotations have become commonplace today, having entered the common vernacular with widespread ubiquity. For everyone from hoteliers, to bankers, to sports broadcasters are referencing '*paradigm shifts'* and the impact these shifts are having on their specific domains. And therefore, in a very real way, the Kuhnian concept of paradigm shift itself became, and remains, a *topoi*: a way of looking at the world, of structuring, mediating and organizing experience, and of attempting to understand social reality through the use of certain core concepts.[161]

Having encountered in the preceding Section Knorr-Cetina's analysis on methodological incommensurability in the natural sciences, as well as the topics explored in the Darwin Chapter, now one sees Kuhn's famous essay and its concepts being appropriated across disciplines as well. What is one to make of the appropriation of these ideas across diverse disciplines? For while the difference exists in that in the case of social scientists using Kuhn and his *topoi* of the paradigm shift it is not appropriation from the natural sciences to the social sciences, but appropriation from Philosophy and History to the social sciences, it is appropriation nonetheless.

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[160] Marcum, *Kuhn's Revolution,* 177; "*To detect parallels*." I compare this to Wallace's phrase "*the possibility of a similarity of process*" below and to the Richard Dawkins' earlier quote (footnote 41) where Dawkins says "*there may be enough in common between them to justify some comparison of principles."* These ideas are central to my idea of interdisciplinary appropriation. My question is what, exactly, do these terms mean and how should one proceed with these? As guides, or as cautions?

[161] I am not sure how much of an authority Australian philosopher Howard Sankey is, but reminiscent of what E.A. Burtt said of Isaac Newton in Section I (pp.99) Marcum writes the following: "'When Kuhn died in 1996,' as Howard Sankey testified, 'he left the field of history and philosophy or science a different field from the one he entered'" (Marcum, *Kuhn's Revolution,* 158).

While I cannot speak directly for those who have made their analysis along Kuhnian lines or who have incorporated Kuhn's analysis into their own, I believe all social scientists should reflect on whether they are using the most adequate conceptual framework(s) when undertaking an inquiry of phenomena, and that they are mindful of appropriating methods and ideas from one discipline to another. For again, if one begins from the wrong starting-point, from a focal point or framework that is not *that-which-is-the-case,* one will necessarily error in their analysis, and knowing how far a *topoi* may be stretched into another realm can be an exceptionally difficult task, that which I highlighted with Darwin, and that which Anthony Wallace remarks on in the introduction to a 2003 collection of his essays published by the University of Nebraska Press:

> One of the intellectual problems associated with concepts such as 'revitalization movements' and 'paradigmatic processes' is indeed to define the optimum scope of their application. If one is a splitter by temperament, one tends to restrict the usage of such terms to a narrow range of phenomena; in the case of revitalization movements, for instance, to religious movements led by a visionary prophet in preliterate societies in colonial situations. To those of us who are lumpers, revitalization can occur in any society, large or small, industrial or preindustrial, be secular or religious, and be led by anyone from a charismatic prophet to a committee of atheistic politicians. Splitters would restrict paradigms to science; lumpers would generously lather the idea over technology, art, theology, and any other field that seems to qualify, under the rule, 'If it walks like a duck, and quacks like a duck...' Another boundary problem concerns the entity to which reformers address themselves. When the whole society is explicitly intended as the target (as in my formulation), the label revitalization clearly applies. But what are we to call efforts to abruptly reform, or revive, merely an institution like a university or a telephone company, or other small component within the larger society, without pretension to wider goals? Here my own preference would be to recognize the possibility of a similarity of process but not to employ the term 'revitalization,' lest it be diluted by too liberal usage.[162]

"*Recognize the possibility of a similarity of process*." This is a wonderful way to phrase it as it represents both an open and a closed door, the possibility of answering both yes and no; sometimes yes; sometimes no. It should be evident that I believe in such a similarity of processes due to my belief in the commonality that collectives share in their inherent structure and in being based on specific conceptual foundations, but I

[162] Wallace and Grumet, *Revitalization and Mazeways*, 7.

also believe that every case, every discipline, is unique and worthy of its own distinct inquiry. I do not believe there is a single, universal explanation for all these types of shifts in all disciplines. Contingency trumps causality in the real world and as such direct, single-causal explanations in regard to complex events should slowly be phased out of our methods and models.[163] These are difficult philosophical questions, very complicated matters, and one cannot adopt a yes/no, black/white attitude in regard to theories/methods being 'transferable' from one discipline to another. This being, of course, in line with the central argument I am making in this essay against reductionism and the need to look at the world from a new perspective.

An example, then, to end this Section: Kuhn famously stated that when a paradigm shift occurs the concepts, terms, and definitions used on either side of the divide become incommensurable.[164] What is one to make, then, of the complications associated with such a central concept of the Kuhnian *topoi* when one turns to the social sciences? As quoted in the Preface, in *The Great Transformation* political economist Karl Polanyi emphasized what appear to be strictly incommensurable paradigm-esque shifts in regard to contractual law and labour systems. Once contractual law and private property rights enter a social system, the old system becomes obsolete; it does not 'fit' anymore; it becomes incommensurable. Thus postulates Karl Polanyi.

However, on the other side of the argument, literary theorist Caroline Levine highlights the non-incommensurable aspects of society, arguing in *Forms* that there is a residual element to all social transformations.

> Repetition as a form is so crucial to the endurance of institutions that it helps us to understand how apparently residual elements can last into distant futures, thus collapsing distinctions between dominant, residual, and emergent. That is, if we understand institutions as taking shape every day through the re-enactment of norms and practices, this means that they

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[163] Because they are idealizations. A single causal explanation does not satisfactory explain complex events. The decimation of Hiroshima was caused by a nuclear bomb. But it was not caused *only* by the explosion. Many events had to occur in order for the bomb to explode when and where it did, and a great example of this type of thinking is found in the final chapter of American historian Christopher Browning's *Ordinary Men,* where he discusses the many and varied 'causes' of events in relation to the Holocaust.

[164] This too has been criticized. See, for example, Harvard University professor Peter Galison's, *The Disunity of Science: Boundaries, Contexts, and Power.*

> always depend on citations borrowed from the past. There is thus nothing in the dominant that is not in some sense residual. [165]

Levine, then, follows the ideas explicated above in regard to the structure-behaviour dialectic in that she assumes there is some sort of 'golden thread' that links institutional change from one regime to the next. Who is right, Levine or Polanyi? Or is this even the right question to ask? With the old linear, rationalized perspective it may be, but by looking through the *topoistic* perspective one can begin to see that there is much more here than simply asking who is right and who is wrong. There is much more here, indeed.

[165] Levine, *Forms,* 63.

Section V – Revitalization Movements

The previous two Sections focused on the second aspect of the *topoistic* perspective: the span of *topoi* and the importance of this for understanding the world today and in moving beyond the prevailing reductionist *topoi*. This Section and the next focus on the third aspect of the *topoistic* perspective: the importance of conceptual organization and reformulation in shifting from one *topoi* to another.

Here I explore Anthony Wallace's revitalization movements in order to highlight the shifting nature of *topoi* on a larger level in examining full-cultural shifts, thus moving on from smaller *topoi* such as an epistemic culture or scientific theory. This Section, then, provides scholarly verification that cultures/societies can and do change in the manner I am suggesting, with this verification adding a hint of optimism to my inquiry. The type of cultural change that I am advocating has undeniably occurred in the past, and so the task today, though daunting, is not insurmountable. Such change can happen again.

The remainder of the essay is also more specifically concerned with issues associated with the paradigm observer and with the processes and difficulties involved in being the paradigm observer. Wallace's theory of revitalization movements offers an outline of how a paradigm observer may come to a new way of seeing the world and subsequently change their overarching cultural *topoi.* The terms *topoi* and paradigm observer are not used by Wallace, of course, but as he outlines how a single individual can bring about a change in the way an entire culture sees and experiences the world, I include him here as his theory is closely related to my own hypothesis of the paradigm observer discovering a new way of seeing the world. Wallace does not offer a guide for how revitalization occurs in all circumstances, or how one may occur again in the future, he offers an elucidation of the mental processes that a paradigm observer possibly undergoes in the process of such a *topoi*-shifting event. As such, his theory rightly deserves a place in a study such as mine.

In his "Revitalization Movements" paper, Wallace laid out what was for him the process that cultures go through when they change direction; or, as he puts it in the opening sentence of the paper, when there is a "successful innovation of whole cultural

systems."[166] According to Wallace, these movements occur frequently, and "an earnest attempt to collect all revitalization movements described in historical, anthropological, and other sorts of documents, would without question gather in the thousands."[167] He then produces a list of revitalization movements known to have occurred, a selection of which includes: "in North America, the Handsome Lake case (Seneca, 1799-1815), the Delaware Prophet (associated with Pontiac, 1762-1765)…in Europe, John Wesley and early Methodism (1738-1800)…in Africa, the Sudanese Mahdi (the Sudan, 1880-1898), and the Xhosa Revival (South Africa, 1856-1857)…in Asia the Taiping Rebellion (China, 1843-1864); in Melanesia, the Vailala Madness (New Guinea, 1919-1930).[168] And while most of these examples are associated with religious, or spiritual, movements he later enlarges the range of situations in which revitalization movements occur by stating:

> Revitalization movements are evidently not unusual phenomena, but are recurrent features in human history. Probably few men [sic] have lived who have not been involved in an instance of the revitalization process. They are, furthermore, of profound historical importance. Both Christianity and Mohammedanism [sic], and possibly Buddhism as well, originated in revitalization movements. *Most denominational and sectarian groups and orders budded or split off after failure to revitalize a traditional institution*[169] (emphasis added).

As the last sentence makes clear (and as he also makes clear in the long quotation on pp. 145), these processes function in the secular realm as well, and in developing the idea of a revitalization movement he was attempting to provide the underlying process or mechanism by which a raft of associated movements are known to have occurred throughout the world. Thus pushing the range and variety of revitalization movements out even further, he writes:

> Behavioral scientists have described many instances of attempted and sometimes successful innovation of whole cultural systems, or at least substantial portions of such systems. Various rubrics are employed, the rubric depending on the discipline and the theoretical orientation of the researcher, and on salient local characteristics of the cases he has chosen for study. 'Nativistic movement,' 'reform movement,' 'cargo cult,' 'religious

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[166] Wallace and Grumet, *Revitalizations and Mazeways*, 9.

[167] Ibid., 9.

[168] Ibid., 10.

[169] Ibid., 13

> revival,' 'messianic movement,' utopian community,' 'sect formation,' 'mass movement,' 'social movement,' 'revolution,' 'charismatic movement,' are some of the commonly used labels. This paper suggests that all these phenomena of major cultural-system innovation are characterized by a uniform process, for which I propose the term 'revitalization.'[170]

Therefore, having shown that according to Wallace the revitalization process is both well-documented and known to have occurred throughout the world and in various cultures, I now turn to the inner-workings of a revitalization movement and how Wallace outlines their formulation.

The key aspects of the process are disillusionment and individual stress, as a revitalization movement "occurs under two conditions: high stress for individual members of the society, and disillusionment with a distorted cultural *Gestalt*."[171] The use of the term *Gestalt* is important here as it links Wallace's theory with a central idea that has come up repeatedly throughout this paper: how different individuals can *see* something completely different when looking at the same entities/phenomena (more on this below). A third aspect that is also critical is how the proponents of a revitalization movement must understand their culture as a system.[172] Defined in more detail, then:

> A revitalization movement is defined as a deliberate, organized, conscious effort by members of a society to construct a more satisfying culture. Revitalization is thus, from a cultural standpoint, a special kind of culture change phenomenon: the persons involved in the process of revitalization must perceive their culture, or some major areas of it, as a system (whether accurately or not); they must feel that this cultural system is unsatisfactory; and they must innovate not merely discrete items, but a new cultural system.[173]

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[170] Ibid., 9.

[171] Ibid., 28.

[172] A cultural system, of course, is an open-ended system and not a closed-system, as discussed in Section II.

[173] Ibid., 10; Hungarian chemist/philosopher Michael Polanyi (1891-1976) disagreed with this, emphasizing what the 'self-organization' of cultural systems. From the introduction to *The Tacit Dimension: "*I shall show, for example, that when originality breeds new values, it breeds them tacitly, by implication; we cannot choose explicitly a new set of values, but must submit to them by the very act of creating or adopting them." Michael Polanyi, *The Tacit Dimension,* (Chicago: University of Chicago Press, 2009), xix.

Therefore, in the process of revitalization there is disillusionment with the cultural system, this disillusionment is the outcome of individuals accumulating stress due to the current cultural *Gestalt*, and eventually the decision is made that the only way to relieve this stress is to actively change the cultural system. The outcome of the process is, as the last sentence indicates, "*a new cultural system.*"

Central to this process is the idea that all individuals in a society react to aspects of their culture and these reactions can be either positive or negative. In the case of negative this involves increased stress and the individual starts receiving what Wallace calls "signals." These signals tell the individual there are issues and concerns with their current cultural system, and it is when they receive too many negative signals that an individual becomes disillusioned and the process of revitalization begins.

This reaction to stress and an individual receiving signals from their cultural system occurs through what Wallace calls the *mazeway*: the internalization of "nature, society, culture, personality, and body image, as seen by one person."[174] The *mazeway*, then, is the internal mechanism through which an individual *interprets* their world; it is how an individual in a collective makes sense of the blooming, buzzing confusion that surrounds them, and how they live and cooperate with other members of their collective and the physical, cultural system they live in. "It is therefore functionally necessary for every person in society to maintain a mental image of the society and its culture," and this mental image Wallace calls the *mazeway.*[175]

The term is a neologism Wallace arrived at by way of analogy, and by appreciating how he came to the term one can better understand its centrality for the individual, the culture, and for revitalization movements. This from another essay titled "Mazeway Disintegration: The Individual's Perception of Socio-Cultural Disorganization":

> To summarize, then, this formulation, which combines elements of culture, learning, and psychoanalytic theory: it is proposed that we regard physical objects external to the individual's perceptive apparatus, including natural objects, elements of material culture, and human bodies, as constituting a 'maze,' which presents the individual with cues…The individual's behavior

[174] Ibid., 12.

[175] Ibid., 12.

> in running the maze in order to obtain satisfactions is the learning of a *way* (systems of action sequences), and to the extent that the way of using the same maze is similar among many persons, the anthropologist can denote the modalities of individual ways as elements of culture or national character. These ways, furthermore, can in man [sic] be abstracted, analyzed, verbally described, and reified, and be presented as cues by persons, by writing, and so forth.[176]

The '*mazeway*' puts forth the idea that humans have an internalized map of their world that is made up of "*physical objects external to the individual's perceptive apparatus,*" and that the individual learns a 'way' to run this maze as a manner of obtaining satisfactions. Further, when people coalesce in a group and 'run' their respective, similar, *mazes* in a collective fashion, the anthropologist can begin to collect and detail aspects of a particular culture through observing this. It is then by understanding and noting changes in these modalities that the anthropologist can find the evidence of a revitalization movement having occurred.

The key to understanding the *mazeway* and revitalization movements is the idea that all humans find a 'way' to satisfy their wants in the 'maze' that is their cultural system, and that this can be disrupted by stress which then leads to disillusionment. As each individual 'learns the way' in their society and reacts to the stress that is caused through their navigating the maze, as a society changes (or remains the same) the individual's *mazeway* reacts to this. If the individual receives too much negative, recurrent, and continual stress, it can become unbearable for the individual, so unbearable that they are unable to cope with the source(s) and they seek to actively change their cultural system as it has become unable to satisfy their wants and needs. Wallace:

> Whenever an individual who is under chronic, physiologically measurable stress, receives repeated information which indicates that his *mazeway* does not lead to action which reduces the level of stress, he must choose between maintaining his present *mazeway* and tolerating the stress, or changing the *mazeway* in an attempt to reduce the stress. Changing the *mazeway* involves changing the total *Gestalt* of his [sic] image of self, society and culture, of nature and body, and of ways of action...The effort to work a change in *mazeway* and 'real' system together so as to permit more effective stress reduction is the effort at revitalization; and the

[176] Ibid., 184

> collaboration of a number of persons in such an effort is called a revitalization movement.[177]

When an individual cannot deal with this stress through their existing *mazeway,* the individual must "*[change] the* mazeway *in an attempt to reduce the stress,*" and the result of this is a new way of looking at the world: "*changing the mazeway involves changing the total Gestalt of his [sic] image of self, society and culture, of nature and body, and of ways of action*." This *Gestalt* switch is carried out through a reconceptualization or reformulation of the underlying elements of the culture. As Wallace writes in the "Revitalization Movements" essay, "whether the movement is religious or secular, the reformulation of the *mazeway* generally seems to depend on a restructuring of elements and subsystems which have already attained currency in the society and may even be in use."[178] A revitalization movement, then, is not a complete break from the past and a rejection of everything in the culture, a 'turning the clock back to Year Zero,' but it is a reformulation of elements already present in the cultural system which results in a shift of perspective, in a new way of *seeing the world*. This is, in fact, indicated in the name of the movement as *revitalization*; it is a new way of looking at the existing system, a revitalizing or rejuvenating of existing elements and subsystems that is itself brought about by "visions of a new life by individuals under extreme stress."[179]

This reformulation and new way of seeing is thus internal and psychological. It involves a change in the individual *mazeway*, the underlying physical society, at least to begin with, does not change: the vision of how people *could be living compared to how they are now living changes.* That is, the process of revitalization involves an individual seeing the same physical world, but seeing it from a new perspective; they are still looking at the same structures, entities, people, etc., but what they see is markedly different from what they saw before, hence the importance of the term *Gestalt.* A revitalization movement, then, involves a conceptual reorganization and not a complete refutation of the elements in the culture: it represents a new way of *seeing* the same world.

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[177] Ibid., 12.

[178] Ibid. 17.

[179] Ibid. 14.

This is why the use of the term *Gestalt* is so crucial. In reference to German psychologist Wolfgang Kohler's (1887-1967) famous *Gestalt* diagrams, in a revitalization movement the physical *place,* the physical objects external to the individual, does not change; the individuals vision of the place changes. Just like in Kohler's diagrams where the physical picture does not change, but what a person *sees* in the picture changes. Again, the actual, underlying material on which the drawing is printed in no way changes, yet a person unmistakably goes from seeing two faces to seeing a wine goblet. In a revitalization movement the underlying, physical society does not change, *but the paradigm observer's vision of it changes*. In the process of revitalization, then, an individual does not immediately change the physical world they are living in, an individual changes the way they *look* at the physical world they are living in, and this then presumably leads, at some point in the future, to the physical place itself changing.

Lastly, Wallace uses the concept of the *mazeway* in combination with what he calls the 'real' system: "*The effort to work a change in mazeway and 'real' system together so as to permit more effective stress reduction is the effort at revitalization*."[180] When formulating the *mazeway* (pp. 151, above) he specifically separates the *mazeway* – the individual's internal mental mechanism – and the "*physical objects external to the individual's perceptive apparatus, including natural objects, elements of material culture, and human bodies."* Therefore everything that encompasses the 'real' system outside the *mazeway* is what he calls the *maze,* and this is what makes up the everyday, lived environment of the individual, a distinction that corresponds precisely to what I outlined in the General Introduction in regard to the physical and the mental *topoi* uniting in one in human societies.[181]

As the individual lives in their daily, physically lived environment this causes them to react mentally to this world. An individual largely thinks the thoughts they do, as I have stated earlier, because they are in the physical place that they are in. Wallace's 'real' system, in other words, is the physical *topoi,* and the internal mental mechanism of the *mazeway* corresponds to the mental *topoi.* As the effort to combine these and make them congruent to the point of excessive stress reduction is the end result of a revitalization movement, one sees in Wallace's theory the ideas I presented in the

[180] Ibid., 12.

[181] Ibid., 184.

General Introduction regarding the physical and the mental *topoi* and how they interact with each other, blending and interacting to continually create and re-create the world one lives in through the structure-behaviour dialectic.

As this new way of seeing the world comes about by a reconceptualization of existing elements in a cultural system, by the recognition and 'seeing' of those entities which have remained hidden in looking at the world from the 'old' perspective, one can assume that it is through the paradigm observer that such a change occurs. An assumption to which Wallace seemingly agrees, writing as he does: "The reformulation also seems normally to occur in its initial form in the mind of a single person rather than to grow directly out of group deliberations." [182]

[182] Ibid., 17.

Section VI: How we Conceptualize the World is the World.

All human beings live with particular ways of seeing the world and these are based on certain concepts. Certain ways of seeing are taught from an early age and they so permeate one's mental sphere that they are hardly recognizable, if recognizable at all. They are simply ingrained and accepted as 'the way the world is.' Other ways of seeing the world one learns through training and education as one grows older, and these are likewise based on concepts and presuppositions. These ways of seeing can become every bit as influential in shaping how one sees the world as those taught from an early age. Consequently, as both these ways of seeing the world are based on concepts, how one views the world conceptually matters greatly as this guides all subsequent observations and perceptions.

This last Section builds on these ideas and again emphasizes the third feature of the *topoistic* perspective: the conceptual nature of *topoi*, the importance of conceptual organization, and how a reformulation or reconceptualization of phenomena can lead one to see the world in a new way. While emphasizing these ideas, I also highlight the obverse: that at times a person is unable to get beyond their ingrained conceptual presuppositions and see *that-which-is-the-case* because they are unable to reconceptualize phenomena. If what I am arguing is correct, that we are today looking at the world through an out-dated *topoi* and that this *topoi* is insufficient for dealing with present social realities, then understanding the importance of conceptual foundations, conceptual organization, and the reconceptualization of phenomena could be central for arriving at a new way of seeing the world.

Here I look more closely into the effects of conceptual organization on observation with philosopher Norwood Russell Hanson's *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science*. While Hanson is principally concerned with particle physics, his work is important for my analysis as his focus is on how what one understands conceptually affects what one then sees in the world; or, again, how one is at times *unable to see* because of an inability to properly conceptualize phenomena. As the ability to see that which cannot be seen from within the dominant *topoi* is central for discovering a new way of looking at the world, and because humans are taught, trained, and indoctrinated to see the world in specific ways – because everyone learns how to *look* in specific ways – it can often be the case that

the only way to learn to see what has up until now gone unseen is to go beyond how one has learned to look, and this is done by reconceptualizing how one looks at the world.

I begin with Hanson's portrayal of Galileo Galilei and Rene Descartes, and how Descartes was unable to understand the true nature of motion because he was unable to *see* acceleration in terms of time as opposed to distance travelled. And while this may seem a trifling matter to the non-physicist, it is quite important for my argument here. For in outlining the manner in which both approached freely falling bodies, Hanson shows that Descartes could not understand acceleration as Galileo finally did, because he could not properly conceptualize the phenomena.

For a long time, however, neither could Galileo, and this was due to the conceptual background that Galileo was immersed in and through which he looked at the problem to begin.[183] Galileo came of age in a scientific community that still accepted Aristotle's theory of motion; the idea that freely falling bodies increased in speed as they fell towards the earth due to the natural attraction of matter to the centre of the earth, and that consequently heavier objects fell faster than lighter ones. By Galileo's time there were thinkers moving away from such a conceptualization of motion and gravity, but the conceptual framework that Galileo himself was educated in was a version of Aristotle's physics know as *impetus theory*. Galileo later achieved great fame for redefining the nature of freely falling bodies free from these false Aristotelian presuppositions, and, as Hanson points out, it was from a reconceptualization of the nature of freely falling bodies that Galileo was able to achieve this.

Galileo did this by reimagining the relationship of acceleration to *time* and not *space,* and this reconceptualization was what allowed him to eventually understand the true nature of the phenomena. Put more technically, he reconceptualized falling bodies in a manner that allowed him to see that velocities of falling objects are proportional to the times of their fall, and not proportional to the distance the falling object has fallen

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[183] Galileo attempted to formulate a law of falling bodies in a 1604 letter to Paolo Sarpi where Galileo misidentifies *that-which-is-the-case* in regard to freely falling bodies. This incorrect conceptualization of phenomena is what Galileo eventually overcame and he was able to postulate his law of falling bodies by 1632 and publish it four years before his death in *Two New Sciences* (Hanson, *Patterns of Discovery,* 36-49).

from its starting point. This reconceptualization Descartes was not able to perform, as Hanson points out "Descartes joined the others in treating uniformly accelerated motion as that in which velocity increases in proportion to the distances traversed, and not in proportion to the times."[184]

Now, I have repeatedly used the word reconceptualization, and what is meant by this is that by removing oneself from the dominant way of looking at phenomena (impetus theory, for Galileo) and choosing a different conceptual basis to look at it, one arrives at a distinctly new way of looking at phenomena. This comes first from the recognition that the current way of viewing the phenomena is just 'not right' in some sense, and it is followed by the attempt to set this right through viewing the phenomena from another perspective. In other words, a reconceptualization means choosing new foundations from which to evaluate/make-sense-of what one is seeing, and this reconceptualization necessarily results in viewing phenomena through a completely different framework – though not necessarily resulting in viewing it through the 'right' framework, of course.

For example, humans could reconceptualize their relationship to animals by stipulating that all animals are Gods. Nothing in animals would change; Gods or not, they would still be *exactly the same entities they were before the reconceptualization,* however what would change was first how humans *saw* animals, and then likely how humans acted towards animals. This is what I tried to highlight with the *Gestalt* switch in revitalization movements in the preceding Section, and what is meant by Galileo's reconceptualization of freely falling bodies in terms of time instead of space. He decided to look at and evaluate freely falling bodies from entirely new foundations, and these new foundations, it turned out, while having nothing to do with the physical phenomena themselves, allowed him to see *that-which-is-the-case* in regard to freely falling bodies. Consequently, one sees here justification for my repeated insistence that how one *sees* the world matters greatly.

Descartes was unable to see *that-which-is-the-case* in regard to freely falling bodies because he was looking at the problem through the eyes of a geometer and mathematician and not through the eyes of a physicist. That is, he was looking at it

[184] Ibid., 46.

through the *wrong conceptual framework*, and this is central for understanding how Galileo *reconceptualised* the phenomena and subsequently saw *that-which-is-the-case*. Galileo was able to look from an entirely new perspective, a perspective that is now called modern physics, instead of looking at it as a geometer, and in stating it this way I hope the reader can begin to see the importance of conceptual frameworks. Geometry and Physics are based upon different concepts and these concepts and the frameworks built up around them – rules, structures, and norms and standards of thought and behaviour – determine *what* and *how* a person then sees phenomena in the world. Here is how Hanson describes Descartes' conceptual difficulties:

> Here is a pure geometer considering a problem of physical space and motion, and this is why he does not grasp Beeckman's principles, nor see the problem as does his correspondent…But it is understandable why this factor should so long have been overlooked: thinking new thoughts in a conceptual framework not designed to express them requires unprecedented physical insights. In the history of physics few could sense the importance of things not yet expressible in current idioms.[185]

Therefore, while both Beeckman and Galileo were able to reconceptualise the problem as a physics problem and not as a geometry problem, Descartes was simply unable to see it this way this. However, remember that for a long time neither Galileo nor Beeckman were able to see it this way either, and the final two sentences help one to understand why this is so: "*thinking new thoughts in a conceptual framework not designed to express them requires unprecedented physical insights*." Their conceptual framework, that of impetus theory, was not designed to allow such thoughts, nor was the geometry of Descartes. Therefore, Galileo and Beeckman had to go beyond this conceptual framework to see *that-which-is-the-case,* and the difficultly here is that this requires the recognition of "*the importance of things not yet expressible in current idioms*." That is, it requires recognizing the significance of those entities/phenomena which the dominant *topoi* is categorically unable to account for; recognizing and then *understanding* that which has remained hidden to all previous observers.

[185] Ibid., 46; Isaac Beeckman (1588-1637) was a Dutch philosopher and contemporary of Descartes who, according to Hanson, formulated his own principle of the conservation of motion as early as 1613 (Ibid., 44).

How Galileo came to *see* acceleration, then, was based not on empirical but on conceptual considerations, and this involved a 'leap' on Galileo's part. To understand acceleration the way he eventually did, he had to commit to a conceptual framework without knowing whether it was either *a priori* or *a posteriori* correct. He had to allow his mind to accept that which could not be either theoretically or empirically proven beforehand, but which *might* then allow the phenomena to 'make sense.'[186]

The story of Galileo dropping two stones from the Leaning Tower of Pisa is almost certainly apocryphal, and it was not from running his inclined plane experiment a couple of times one afternoon that he all of a sudden sat back and exclaimed 'that's it!', immediately understanding *that-which-is-the-case* in regard to freely falling bodies and acceleration. The famous inclined plane experiment came *after* Galileo's reconceptualization and was used to confirm what he had recently reconceptualized. Therefore, it was only after he made the conceptual leap that allowed him to look *outside* his prevailing *topoi* that he was able to devise the famous experiment and empirically verify his intuitions.

There was no eureka moment caused by his looking at phenomena and then suddenly understanding the truth about freely falling bodies, and, according to Hanson, this conflation of empiricism and conceptualization may be responsible for the commonly held, though largely fallacious, conception of the nature of discovery: "philosophers who dwell exclusively on the attention-getting events fail to note what is involved in directing attention in some desired manner. It cost Galileo thirty years of labour before he saw the conceptual structure of acceleration clearly enough to confirm his ideas by the inclined-plane experiment."[187]

So while Galileo eventually came to see the nature of falling bodies differently, it was not an example of seeing with his eyes as in empirically looking at falling bodies and

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[186] In Section III of this Chapter I briefly discussed the uncertainty principle in physics. There I stated that one cannot do particle physics without taking uncertainty into account. That it is a core part of the epistemic culture and as such it has an important role in all future research. However, if one were to do genuinely original and revolutionary research in theoretical physics, one could engage in thought experiments as if uncertainty did not hold and this is the type of conceptual leap I am trying to outline here. It is a reconceptualization that goes so far beyond *that-which-is-the-case* that it is almost unbelievable one would venture to such a place. However, this is often exactly what is required in order to be a paradigm observer (think realm of intelligibility and the 'irrational').

[187] Ibid., 68.

understanding.[188] It was, in contrast, a learning to see on a new conceptual level, a learning to see, to use the Platonic phrase, with the 'mind's eye,' a helpful metaphor that highlights the ability to see something *conceptually* before one is able to see it *empirically*. Again, Descartes was not able to see acceleration as Galileo eventually did because he was unable to conceptualize it with the mind of a physicist and incorporate the crucial time element into his analysis, and this was independent of how many rocks he saw falling. By looking at it only through the eyes and with the mind of a geometer he could analyze it only in terms of space, and so he could not come to see *that-which-is-the-case* in regard to freely falling bodies.

Both the complications and misconceptions inherent in such an understanding of evidence and in the tenacity in which people adhere to their prevailing *topoi*, are highlighted in Scene Four of Bertolt Brecht's play *Galileo*. In this Scene a crowd is gathered at Galileo's and he implores them to look through his telescope so that they may see the four moons of Jupiter. Of course, they all reject his offer and the Scene ends with a dejected and forlorn Galileo.

Of the people present one is an Aristotle-deferring mathematician who dances-around Galileo's requests to look through the telescope, and who remains steadfast in his Aristotelian beliefs throughout the short scene. I want to suggest first that there is nothing out of the ordinary with this. Human beings hold on to their beliefs against almost all odds, even against empirical evidence, and thus had Brecht's obstinate mathematician looked through the telescope and saw the moons of Jupiter it is farcical to believe that he would have turned around and said: "okay Mr. Galilei, you're right, I'm wrong. Aristotle was wrong. We need to reformulate our worldview to account for the

[188] Galileo matches quite closely the solitary and stressed individual Wallace claims necessary for a revitalization movement to occur. With the story of his being called before the Inquisition and the danger Galileo put himself in, one sees a person clearly under enough psychological stress that they were willing to take considerable risks to change the prevailing order. The prevailing Aristotelian theory of motion and the surrounding Aristotelian dogma must have increased this stress to such a level that he eventually reached the point where it was unbearable for him. He believed *that-which-is-the-case* to be outside the prevailing *topoi* and he sought to make this known, even with the full knowledge that fellow Italian Giordano Bruno (1548-1600) had met his death at the hands of the Inquisition. Galileo was very much the paradigm observer. He put forth his ideas, collected followers and adherents, and with the 1687 publication of Newton's *Principia* the movement he had largely begun was complete. The *Gestalt* shift done. Humanity now saw and experienced a new world and it was Galileo who initiated the shift.

imperfection of the heavens." This is actually farcical on two levels. First, as evidenced in the brief exchange between the characters, the mathematician was so engrossed in his worldview, so convinced of its veracity, that he would not even deign to look through the telescope, something which actually tells one as much as it dismisses about the clever mathematician.

If the mathematician did look through the telescope and see the four moons, there is no guarantee that he would have responded in the above manner, and this is related both to the tenacity in which humans tend to hold to their beliefs and in difference between seeing conceptually with the 'mind's eye' and seeing empirically with the eye. The clever mathematician clearly did not have Galileo's inquisitive mind, his desire to right intellectual wrongs and upset the status quo, nor the conceptual framework and conceptual understanding necessary to comprehend the four moons of Jupiter. Therefore, not being able to understand with the mind's eye what the four moons *really meant,* he was incapable of even looking through the telescope to see what Galileo assured everyone was most certainly there. For from the mathematician's Aristotelian perspective, it was impossible that the four moons could be there and his entire worldview stipulated that the heavens were not like that. Consequently, the mistakes Galileo made were both in underestimating the tenacity to which the obstinate mathematician held to such views, and in overestimating the impact that four small dots seen through a telescope could have on another human being (or group of human beings).

Anyone with good enough eye sight can look through a telescope and see four small dots, but not every one can look through a telescope and see four small dots and understand what they mean, especially if these four small dots are absolute anathema to one's worldview. And when reconsidered in this manner one can better understand the mathematician's refusal to even look through the telescope. His Aristotelian worldview would not allow him to conceptualize an imperfect celestial sphere, to see with his mind's eye that there could be another conceptual organization of the heavens that led to another cosmological and physical reality, and thus he refused to look. Again, for the mathematician it was *impossible* for Jupiter to have any moons and so it would be ridiculous for him to even look through the telescope; akin to getting down on one's hands and knees when a young child says there is a dragon under the bed. One knows

that the dragon is not there because everyone *knows* that dragons do not exist, just as the mathematician *knew* that the moons were not there.

Seeing involves a conceptual shift, not simply the recognition of empirical phenomena, and this *seeing* requires a leap: one the rational mathematician obviously was not ready to make. Galileo himself had to take a 'leap' to see with his mind's eye the true nature of acceleration, then was he able to see it empirically with the inclined plane experiment. The mathematician could not see the four moons of Jupiter with his mind's eye and thus would not even look. He would not even look because even though he could surely see on the empirical level, he could not see on the next level, and thus, in a very real sense, he could not see at all. And so why look?

Lastly, had the mathematician looked through the telescope and acquiesced to Galileo's conceptual vision as hypothesized above, it should strike one as odd, as such a response is uncharacteristic both in the history of science and of humanity in general. All human beings become so entrenched in their own way(s) of seeing the world that it can be very difficult for one to shift from their current *topoi* into another. This is examined in more detail in the Conclusion, but it is related to the difficulty of providing so-called 'direct evidence' and with engaging in argumentation when two people are in differing *topoi,* as was highlighted in Chapter II with Achilles and the Achaeans.

It is for these reasons that I have been referring to the mathematician as both 'clever' and 'rational' in the preceding. His rejection of Galileo's request was entirely in line with both the *topoistic* perspective and the realm of intelligibility. For from within his Aristotelian *topoi,* what Galileo was stipulating was on the third level, the 'irrational.' If the moons were indeed there this would not be either 'correct' or 'correctable' within the Aristotelian realm of intelligibility and thus from within his perspective the 'clever' and 'rational' thing for the mathematician to do was to treat Galileo's request and his pleas as exactly what they should have appeared to him: as irrational.

One understands through concepts and conceptual organization, through one's '*scheme of things*,' and by the way in which one's guiding *topoi* structures, organizes and mediates their experience of the world. Empiricism works best as a tool to learn about and comprehend phenomena, but not as a lightning bolt from the heavens which allows one to immediately *understand*. Empiricism and empirical data are crucial for

coming to see t*hat-which-is-the-case*, this is undeniable, but it is rare that a single instance of empirical phenomena can change one's entire conceptual framework – unless, that is, one is philosophically and conceptually ready for it.

Galileo tries his best to convince the mathematician and others to look, but as anyone who has ever tried understands, attempting to convince someone when one party has seen with the mind's eye and the other has not is a matter of great difficulty. It is a case of talking at someone and not with someone, and almost all attempts leave the paradigm observer, at best, dejected and forlorn.

Hanson elaborates on these themes by looking at the Danish astronomer Tycho Brahe (1546-1601) and his German contemporary Johannes Kepler (1571-1630). Both Brahe and Kepler made important contributions in the shift from the geocentric to the heliocentric view of the solar system, but there was a major difference separating the two: Brahe believed the earth was at the centre of the universe whereas Kepler believed the sun was at the centre of the universe.[189] Hanson imagines a situation in which one morning the two men are sitting on a hill watching the sun rise and asks: "Do Kepler and Tycho see the same thing in the east at dawn?"[190] For if one looks at the sun and believes that it is moving, and the other looks at the same sun at the same moment and believes that the earth that is moving, are they actually looking at the same thing? The answer, fortunately or unfortunately, is both yes and no.

On the empirical level they certainly are. The light emitted from the sun and the photons hitting their retinas are the same; the physical phenomena on this basic level identical. But as the image travels from the eye and into the brain it is transformed-into/acknowledged-as a perception and becomes conscious in the mind of each man. When this happens the transmission of information from the photons interacts in a mysterious way with the theories/ideas each has regarding the sun and the earth, and

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[189] Today we would say solar system, but they still thought in terms of the solar system as the universe. Modern astronomy has shown how immense the universe actual is, and Einstein and others that there is no centre, per se. *The Oxford English Dictionary* records the first usage of the term solar system in English in 1704, by John Locke (*Oxford English Dictionary*, online edition. http://www.oed.com.proxy.lib.sfu.ca).

[190] Hanson, *Patterns of Discovery*, 5.

the answer to Hanson's question shifts to an emphatic "no." They are still looking at the same sun, but they are not *really* looking at the same sun as they have fundamentally different conceptions of the sun's place in the conceptual scheme of the universe. Therefore, on the two levels they both are and are not looking at the same thing: theoretically no, empirically yes.[191]

Hanson continues to emphasize these themes with the following question: "Would Sir Lawrence Bragg and an Eskimo baby see the same thing when looking at an X-ray tube? Yes, and no. Yes – they are visually aware of the same object. No – the ways in which they are visually aware are profoundly different. Seeing is not only the having of a visual experience; it is also the way in which the visual experience is had."[192] I can then flip the question and modify it slightly to ask: 'Would Sir Lawrence Bragg and an adult Eskimo see the same thing when looking at a paw print in the snow?' The answer to this question, of course, is yes and no. In both cases a visual experience is being had, but as Hanson explains, seeing is much more than just having a visual experience. Seeing is also how a visual experience *is had,* and this involves how one comprehends what is seen, and how one comprehends what is seen is a result of training, education, and having learned what to look for.[193]

In reference to Chapters I and II one could likewise ask, would Charles Darwin and Samuel Wilberforce have seen the same *thing* when looking at a flower after the 1859 publication of the *Origin of Species*? And would Achilles and Odysseus have seen the same Trojan War after *kleos* and *time* were lost to Achilles? The answer to both of

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[191] Hanson relies on Wolfgang Kohler's famous 'Goblet-and-Faces' drawing, stating: "we 'take' the same retinal/cortical/sense-datum picture of the configuration; our drawings might be indistinguishable. I see a goblet, however, and you see two men staring at one another. Do we see the same thing? Of course we do. But then again we do not" (Ibid., 12).

[192] Hanson, *Patterns of Discovery*, 15; Sir Lawrence Bragg was an Australian/British physicist. Head of the Cavendish Laboratory at Cambridge when James Watson and Francis Crick discovered the structure of DNA in 1953.

[193] Although not necessarily in the case of Achilles, as Anthony Wallace outlines it. This could be a situation more akin to an 'epiphany' where training and education are not necessarily the most important factors. It comes about with a new vision, often brought by a dream or something of that nature. Dreams, hallucinations, and the like are indeed often cited as the inspiration behind a shift in *topoi,* something that famously happened to Rene Descartes, for example. Wallace: "When there is no vision…there occurs a similarly brief and dramatic moment of insight, revelation, or inspiration, which functions in most respects like the vision in being the occasion of a new synthesis of values and meanings" (Wallace and Grumet, *Revitalization and Mazeways,* 17).

these questions, on the different empirical and theoretical levels, is of course yes and no.

Hanson then brings all of these ideas together, as well as incorporating his main focus of microphysics, and provides an answer for how this is occurs by stating: "It is the sense in which Tycho and Kepler do not observe the same thing which must be grasped if one is to understand disagreements within microphysics. Fundamental physics is primarily a search for intelligibility – it is philosophy of matter. Only secondarily is it a search for objects and facts (though the two endeavours are as hand and glove). *Microphysicists seek new modes of conceptual organization*. If that can be done the finding of new entities will follow. Gold is rarely discovered by one who had not got the lay of the land"[194] (emphasis added).

Important here is that Hanson says it is how Tycho and Kepler "*do not observe the same thing*" that must be grasped if one is to understand how humans, in this case microphysicists, come to disagreements about phenomena. What one does when one looks at the world is *interpret* phenomena; phenomena do not arrive in the human mind in a pure form that makes 'truth' evident for all observers. If this type of objectivity was attainable, phenomena would essentially be the same to all observers, and all people would see the same *thing* when they looked at the sun, or at a paw print in the snow, or at a flower, or at a war. However, this is not the case. Different people interpret phenomena in different ways, through different "*schemes of things,*" and thus *see* entities in vastly different ways when looking at the same object(s)/phenomena in the world.

Consequently, one must ask how the same phenomena can mean something entirely different to two people. Fortunately, one need not go far for an answer as Hanson almost immediately provides one: it is because of different modes of "*conceptual organization*." Brahe and Kepler see different realities when they look at the sun because they are looking at it through different *conceptual frameworks,* through different modes of *conceptual organization.* Human beings come to view phenomena differently based on how they conceptualize the world, on *how they see the world,* and this not only

[194] Hanson, *Patterns of Discovery*, 18-19.

makes all the difference in the world, this, as has already been pointed out, is what makes the world 'the world.'

For recall Peter Winch's words from Chapter II: "It may be worth reminding ourselves of the truism that when we speak of the world we are speaking of what we in fact mean by the expression 'the world': there is no way of getting outside the concepts in terms of which we think of the world…The world is for us what is presented through those concepts."[195] Combining this again with Erazim Kohak's words from the same Chapter, "speakers, seconding each other, constitute a shared, internally determined monad into which the world can enter only in predetermined categories," and I postulate the following: the predetermined categories that the world enters through are the concepts that make up one's world. [196] One's world, to turn this around, is presented through concepts and these concepts are analogous to the predetermined categories through which the world is able to enter. One sees the world through the concepts primary to one's self and one's culture as it is these concepts that structure, mediate, and organize how one essentially sees and experiences the world.

Consequently, one comes to see the world differently when one reformulates their conceptual framework and comes to a new mode of conceptual organization. In other words, when one shifts into a new *topoi.* And this reformulation and shift all begins with a paradigm observer who is able to look beyond that currently accepted as *the-way-the-world-is* and see *that-which-is-the-case* beyond the confines of their existing *topoi*, something that inevitably opens up a startling array of phenomena that until then are not even known to exist.[197] The importance of conceptual organization and understanding over purely empirical phenomena, the conflation of empiricism and conceptualization, set straight, once again.

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[195] Winch, *The Idea of a Social Science,* 15.

[196] Kohak, *The Ember and the Stars,* 35.

[197] Once an understanding of non-Euclidean geometry emerged, for example, the world of math, science, and technology exploded. There were so many entities unseen that simply needed a new way of looking to become visible, and this new way of looking was the different types of Non-Euclidean geometry.

Several times I have referred to a 'leap' in this essay: the leap of analogy with Darwin, the leap Galileo made to understand acceleration, and now the leap needed to move into a new *topoi.* The leap in this case is when the paradigm observer convinces themselves on the conceptual level that something else might indeed be *the case* and they commit to seeing the world from this new perspective. Things do not 'fit,' they do not make sense in the way that they should. Something is just not right.

Eventually, she/he comes to believe there is something outside their prevailing *topoi* which is superior to how they are now seeing the world, some way in which they could make better sense of the world they are living in, and so they take their leap. This leap, however, is a matter of great difficulty. For how does one know that something is truly wrong with the existing *topoi*, that one is conceptualizing something with the wrong framework and that *that-which-is-the-case* must come from outside the current conceptual framework? Initially ones does not. And, unfortunately, one simply *cannot*.[198]

Part of the difficultly for this lies in matters pertaining to evidence and part in matters pertaining to uncertainty. I touched on these with Galileo, his reconceptualization of acceleration, and Brecht's rational mathematician, but they are worth dwelling on for a moment as it is important to understand that evidence is not evidence unless one is

[198] The 'double bind,' one could almost call it. Systems literature and probability theory refer to it as "exploration vs. exploitation," and the idea is how does one know that the answer to their query will only take a little more work? A little bit more fixing and setting straight and then the answer will arrive? Or when does one decide that they are looking at everything with the wrong conceptual framework and that they have to begin again from totally new foundations? These are questions of immense psychological difficulty. At times a thinker has to go through periods of intense mental anguish trying to determine if they are 'on the right track' or not. And, as we shall see, knowing that one are on the right track is a completely independent activity. One has no authority to ask, one is simply alone. Knorr-Cetina highlights these issues through the self-deception that is now a regular part of high energy physics, discussing how difficult it can be to convince oneself that one has seen something in an experiment or not, whether something is 'noise' or an 'event,' and the incredible difficulties of seeing without being able to rely on a pure empiricism (Knorr-Cetina Chapter 3). Michael Polanyi also examines this in some detail, asking how one knows that what one is working on is the right path/entity or not, and knowing when one should give up on a given train of thought, etc. (Chapter 1 in Polanyi's *Personal Knowledge*). Further, in his work on revitalization movements, Anthony Wallace makes what I am trying to highlight here more accessible in writing: "While the individual can tolerate a moderate degree of increased stress and still maintain the habitual way of behaviour, a point is reached at which some alternative way must be considered. Initial consideration of a substitute way is likely, however, to increase stress because it arouses anxiety over the possibility that the substitute way will be even less effective than the original, and that it may also actively interfere with the execution of other ways. In other words, it poses the threat of *mazeway* disintegration. Furthermore, admission that a major technique is worthless is extremely threatening because it implies that the whole *mazeway* system may be inadequate" (Wallace and Grumet, *Revitalization Movements,* 15).

looking at it with the right conceptual framework, and that what is evidence to one person can be nothing to another, even in the natural sciences. For to believe that evidence looks once and everywhere alike to every observer, and that there is and always will be conclusive agreement as to what the evidence is, is to believe a farce; a farce that largely hinges on the mistaken presupposition of the reductionist *topoi* that there is an objective way of seeing the world. Different people see and experience the world differently because of their different conceptual frameworks, and this affects whatever it is that one may wish to consider as evidence. Norwood Russell Hanson once again:

> To say that Tycho and Kepler, Simplicius and Galileo, Hook and Newton, Priestly and Lavoisier, Soddy and Einstein, De Broglie and Born, Heisenberg and Bohm all make the same observations but use them differently is too easy. It does not explain controversy in research science. Were there no sense in which they were different observations they could not be used differently. This may perplex some: that researchers sometimes do not appreciate data in the same way is a serious matter. It is important to realize, however, that sorting out differences about data, evidence, observation, may require more than simply gesturing at observable objects. It may require a comprehensive reappraisal of one's subject matter. This may be difficult, but it should not obscure the fact that nothing less than this may do.[199]

Consequently, evidence in the form of data and observation can mean different things to different people, even to famous physicists. This is because evidence only begins to 'make sense' once a person has the correct conceptual foundations for interpreting and understanding said evidence, and arriving at this position, as Hanson points out, may require nothing less than "*the comprehensive reappraisal of one's subject matter,*" i.e. it may require that a person come to an entirely new way of looking at the world. How one is able to arrive at the proper perspective and thus understand *that-which-is-the-case,* in other words, how one is able to undertake this comprehensive reappraisal, is the unanswerable question at the heart of discovery. No one actually knows.

What is known, however, is that it first necessitates a leap. A conceptual leap that allows a person to see phenomena from an entirely new perspective without any

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[199] Hanson, *Patterns of Discovery*, 19.

guarantee that this new perspective may be the 'right' one. Consequently, when it comes to the paradigm observer taking this leap and attempting to look past their prevailing *topoi* and see phenomena in a different light, what is required is great courage and resolve, for this is a region of great uncertainty and difficulty. This is where, as map-makers used to write on the unknown regions of their maps, "there be monsters."

For when a person attempts to move from one *topoi* to another, in the process they abandon that which they have up to this point relied on and cast themselves out into the open. They leave behind the formal guides and safety-nets of the past and make their way alone in the world. The formation of a new *topoi*, like the formation of a new scientific paradigm, is a journey into the unknown. One has no roadmap except for an intuition telling them that *that-which-is-the-case* is not what is postulated as *the case* in the prevailing *topoi*, and the uncertainty associated with such a leap can be both frightening and debilitating.

These sentiments are in fact echoed in a statement by E. A. Burtt where he comments on the difficulty of understanding the methods used by Newton and others, in the formulation of modern physics:

> Only a handful of general and often vague statements about his method, which have to be laboriously interpreted and supplemented by a painstaking study of his scientific biography – though, to be sure, he hardly suffers in this respect by comparison with even the best of his forerunners, such as Descartes and Barrow - one of the most curious and exasperating features of this whole magnificent movement is that none of its great representatives appears to have known with satisfying clarity just what he was doing or how he was doing it.[200]

This, I argue, is the logical consequence of what they were doing. When one is 'breaking new ground' there is no set script, no rules to follow, no authority to acquiesce to. Again, one does not know what one is doing except following their intuition that *that-which-is-the-case* must be beyond the current *topoi*, and one cannot develop a methodology to get somewhere if that somewhere is yet unknown. The paradigm

[200] E.A. Burtt, *Metaphysical Foundations of Science*, 208; Isaac Barrow (1630-1677) was Newton's predecessor as the Lucasian Chair of Mathematics at Cambridge, giving up the chair to Newton when he came to understand the potential and the brilliance of the young Newton.

observer intuits what others are incapable of intuiting, and they know that they must follow their vision. It is one of the most difficult philosophical and psychological adventures one can embark upon.

Conclusion: Whereof one Cannot Speak, Thereof one Mustn't be Silent

When one does come to see *that-which-is-the-case*, even in the empirical sciences, next comes the difficulty of convincing one's peers of what one has seen. Put in the language of this essay, when the paradigm observer has come to see beyond

their prevailing *topoi* and seen that which has remained hidden, when they have reconceptualised phenomena and come to a new vision of the world, they next face the challenge of sharing this vision with others. As I will now show, for the paradigm observer seeing *that-which-is-the-case* is only the first hurdle they have to leap over. Beyond this lies an assortment of intellectual, philosophical, and social difficulties which involve sharing and explaining what they have seen with others. Therefore, I close this essay by briefly examining some the difficulties inherent in the paradigm observer's communicating *that-which-is-the-case* to their peers, the challenges they must confront just *to-be-heard*.

Communicating across conceptual divides is difficult, and as I hope to have highlighted in this essay, a conceptual divide is precisely what separates two parties when one member steps outside, and then speaks in terms beyond, the prevailing *topoi.* The Hungarian/British chemist-philosopher Michael Polanyi (1891-1976) highlights this difficulty in a passage from *Personal Knowledge: Toward a Post-Critical Philosophy*:

> We can now see, also, the great difficulty that may arise in the attempt to persuade others to accept a new idea in science. We have seen that to the extent to which it represents a new way of reasoning, we cannot convince others of it by formal argument, for so long as we argue within their framework, we can never induce them to abandon it. Demonstration must be supplemented, therefore, by forms of persuasion which can induce a conversion. The refusal to enter on the opponent's way of arguing must be justified by making it appear altogether unreasonable.[201]

These ideas were of course central to the Achilles Chapter, and Darwin also faced such problems after publishing his (only later) ground-breaking theory of evolution by natural selection. It is indeed one of the principle reasons why it is so difficult for the paradigm observer to convince others of their vision. They simply lack a shared vision and hence a shared vocabulary in which to make their message understood.

However, beyond this there are essentially three other factors that stand in the paradigm observer's path. The uncertainty, fear, and obstinateness involved in shifting

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[201] Polanyi, *Personal Knowledge*, 151.

topoi, something which makes people naturally recalcitrant to such a shift*;* the fact that evidence simply does not appear as 'evidence' for all people; and the fact that there exist no authorities to which the paradigm observer may appeal to.

Of the first and third factors enough has been said already. I ended the last Section by detailing the difficulties associated with evidence, and the final Section of the Achilles Chapter dealt specifically with rational arguments across conceptual divides with the realm of intelligibility. The fourth factor I will get to below. The second factor relates not to the paradigm observer, but to those who the paradigm observer is trying to convince. This was highlighted with Brecht's rational mathematician – recall that within his Aristotelian *topoi* his refusal was utterly rational – and this type of refusal is witnessed throughout the history of science and philosophy in the list of intellectuals who steadfastly refused to accept a new theory regardless of evidence for it, or against their own – one thinks here of the English chemist Joseph Priestly (1733-1804), for example.

Anthony Wallace and his concept of the *mazeway* give an insight into this, with Wallace stating: "Man [sic], in other words, falls in love with his maze and his way of running it because they are associated with every satisfaction he [sic] derives from life, and, indeed, with the maintenance of life itself. The *mazeway* is 'loved.'"[202] That is, humans have this internalized map of the world and as they derive satisfactions through interacting with known objects and elements in the world and this internalized map*,* they come to 'love' the way they make-sense of and see the world. Indeed, people like it when the world makes sense to them, and they are averse to conditions that are confusing, unsatisfying, and when one is unable to comfortably and confidently navigate through the maze of life. Everyone, to be blunt, in some important sense enjoys the way they look at the world, how they see and understand the world, and are at the very least moderately antagonistic towards seeing and understanding the world from another perspective. In other words, all people tend to believe, at least on a certain level, that their way of looking at the world is the *right way* of looking at the world, and they derive satisfaction from this.

This then gives rise to another, perhaps even more difficult, question: why would or should anyone be willing to take the leap that is necessary to follow the paradigm

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[202] Wallace and Grumet, *Revitalizations and Mazeways,* 182.

observer? For if one lacks the conceptual foundations to understand what is being said to them, if one is unable to see with the mind's eye what the paradigm observer is saying is *really there*, then for someone to take the leap and follow the paradigm observer is, in a very real sense, for them to act utterly foolishly. For who in their right mind would leap to a new way of seeing and experiencing the world if it fundamentally *did not make any sense to them*? Consequently, that most people are absolutely (and rightly?) steadfast in their refusal to shift out of their prevailing *topoi* and into another makes obvious sense – something that leads us back to Joseph Priestly, Brecht's rational mathematician, and the last sentence in Michael Polanyi's above quote: "*The refusal to enter on the opponent's way of arguing must be justified by making it appear altogether unreasonable*."

To return one more time to Brecht's play, the mathematician simply would not look through Galileo's telescope; would not engage in any activity that could jeopardize his worldview. The irony here (perhaps not for poor Galileo) is that the very act of looking through the telescope *was Galileo's way of arguing*. It is all he asked the mathematician to do because he thought this was all that was necessary for him to *see.* Yet still he refused; still he was unable to perform the simplest possible act in putting his eye up to a telescope and just looking.

And after his refusal and Galileo's subsequent dejection, what does the crafty mathematician do? Exactly what Polanyi states people are liable to do in such situations: in order to preserve his worldview and his own position, the irascible mathematician is caught trying to make Galileo and his position look unreasonable. As the Scene closes readers (originally viewers) are witnesses to the mathematician walking over and attempting to wipe the lens of the telescope, insinuating by this act that the four moons had perhaps been painted on the telescope by Galileo. In order to justify his own beliefs, the uncertain mathematician had to try and make Galileo and his position appear unreasonable; as if Galileo has painted the four moons on the end of the telescope; as if he were just putting forth a clever hoax; as if there absolutely could not be four moons circling Jupiter.

However, Brecht and his play aside, these are real difficulties that are encountered within Science. Yes, that discipline meant to be the ultimate arbiter in regard to epistemology, knowledge, and certainty encounters these same difficulties,

something that can be illustrated through Michael Polanyi's account of the French physicist Louis de Broglie (1892-1987).

de Broglie won the Nobel Prize in 1929 for his postulation of the wave-nature of matter in 1923, something that was not experimentally verified until 1927. In the intervening years, he experienced difficulties akin to what I am now outlining in regard to the paradigm observer. As Polanyi describes it, "the suggestion made by de Broglie (1923), purely on grounds of intellectual beauty, to ascribe wave nature to ponderable particles, is a case in point. The professors (who included Paul Langevin) to whom he presented the work for the Doctorate were doubtful whether to accept it and wrote to Einstein for advice. The latter recognized its scientific merit and the degree was duly awarded to its author."[203]

de Broglie's work, in other words, went beyond what his teachers could conceptualize and consequently understand, and thus they were unsure whether or not they should award him his PhD. They simply could not conceptualize as could de Broglie what had yet to be given empirical verification, what had not yet come to be commonly accepted as *that-which-is-the-case*, and so they sought recourse in an adjudicator. Fortunately, in this case an adjudicator was found and he turned out to be right, but this could have been nothing more than good fortune and de Broglie could have failed to earn his degree.[204]

However, more substantially, if Einstein had not been there and the degree not granted, or if Einstein was wrong and the degree not granted, particle physics could have been set back immensely. For de Broglie's ideas became a central component of the conceptual framework (epistemic culture) of particle physics, and were foundational for the direction research in particle physics subsequently took. Therefore, even in the natural/mathematical sciences situations arise when *that-which-is-the-case* is so far

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[203] Polanyi, *Personal Knowledge*, 148; Paul Langevin (1872-1946) was a prominent French physicist. Best known for what is today called Langevin Dynamics.

[204] A fortunate choice, for Einstein knew exactly what it was like to postulate a theory without empirical evidence to support it. It was not until four years after he presented his General Theory of Relativity (1915) that there was empirical evidence to support his ideas (1919), and Einstein's theories were not fully accepted and understood in their full potential and veracity until at least the 1960s.

beyond the comprehension of others that appeals to some sort of authority have to be made to see if the claims could even *conceivably* be correct. [205]

However, it is important to note that when it comes to seeing *that-which-is-the-case*, even in matters scientific, appeals to authority are a red herring; not worth asking for because authorities are always authorities in the old way of seeing the world, in the old *topoi.* And in going beyond the prevailing *topoi* and seeing *that-which-is-the-case*, there necessarily cannot be an authority to appeal to as the paradigm observer is quite literally thinking thoughts in a conceptual framework that have never been thought before. And so it is for all of these reasons combined – uncertainty, fear, obstinateness, lack of 'true' evidence, inability to rationally communicate, and lack of authorities to appeal to – that the paradigm observer and their ideas, at least for a period of time, are effectively incommunicable to those outside their new *topoi.*[206]

Thus, if empirical evidence does not have the objective quality that so many have stated it has, or if there is simply no empirical evidence available, must there be only argumentation? But if an argument has to come in terms specifically formulated and given meaning in a specific reference frame (*topoi*), that of either the paradigm observer or their antagonist, does this not make it logically impossible for any agreement to occur? And if there can be no authorities to appeal to then how is the paradigm observer to gain any prominence and support for their theory knowing from human nature and history that human beings are naturally averse to such a shift? What must the *paradigm observer* do just *to-be-heard*? Is there any basis for such views to be either accepted or rejected?

Unfortunately for the paradigm observer, the answer is no. They must try one last thing, the only avenue left open to her/him: the paradigm observer must resort to persuasion. Simple, direct persuasion. For without the standards of commonly held

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[205] This might appear to go against what I said above in that the paradigm observer has no authority to acquiesce to in formulating *that-which-is-the-case,* but this is true. de Broglie did not need Einstein to tell him that his theory was true – he knew that it was. The institution in which he was doing his PhD research needed Einstein's authority in order to grant a degree, and there is a major difference between the two.

[206] Authorities do not like to be proven wrong: they do not like it when someone pip's them and sees *that-which-is-the-case* beyond themselves. That egos are undeniably involved and that science itself can be a sordid affair is unmistakable. See Francis Crick's controversial autobiography on discovering the structure of DNA, *The Double Helix.*

terms and shared conceptual foundations, with one party seeing with the mind's eye and the other unable to, almost nothing can induce a group of human beings to adopt a new *topoi* except for supplication and persuasion.[207]

How this persuasion happens, just as how the paradigm observer arrives at a new way of seeing the world, remains a mystery; something for which a single explanation, nor this essay, can supply an answer. All that can be said is that sometimes this persuasion works and things change, and sometimes it does not. But that remarkably similar processes seem to be involved in both the natural and the social sciences gives us hope that if one among us can find a new way of seeing the world today, then this persuasion can happen again:

> The dreamer undertakes to preach his revelations to people, in an evangelistic or messianic spirit; he becomes a prophet…As he gathers disciples, these assume much of the responsibility for communicating the 'good word,' and communication remains one of the primary activities of the movement during later phases of organization. Converts are made by the prophet…A small clique of special disciples (often including a few already influential men[sic]) clusters about the prophet and an embryonic campaign organization develops with three orders of personnel: the prophet; the disciples; and the followers.[208]

> Proponents of a new system can convince their audience only by first winning their intellectual sympathy for a doctrine they have not yet grasped. Those who listen sympathetically will discover for themselves what they would otherwise never have understood. Such an acceptance is a heuristic process, a self-modifying act, and to this extent a conversion. It produces disciples forming a school, the members of which are separated for the time being by a logical gap from those outside it. They think differently, speak a different language, live in a different world, and at least one or two of the schools is excluded to this extent of the time being (whether rightly or wrongly) from the community of science.[209]

Both Wallace and Polanyi use the term conversion. Etymologically from the Latin for a 'turning around' or a 'turning in,' it perfectly expresses what is at work here. The

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[207] People can be coerced and bribed into virtually anything, but not into *believing.* As a shift to a new *topoi* is a shift into the unknown that necessitates the need to first *believe,* there is effectively only one way to induce people to join you: persuasion.

[208] Wallace and Grumet, *Revitalizations and Mazeways*, 20.

[209] Polanyi, *Personal Knowledge*, 151.

prevailing *topoi* is assessed by the paradigm observer, found to be wanting and ultimately rejected. And this rejection can only come from a turning around and a turning within by the paradigm observer themselves; no one else can lead them to where they are going because it is they alone who are able to see.

Concluding Unscientific Postscript

Intellectual dilapidation is the result of a narrowing of perspectives and methods of inquiry from the seemingly obscure and shadowy heights of multiple and embedded levels of abstraction down to the reductionist and, ultimately, the singular. The modern intellectual dilapidation may very well have led to incredible scientific and technological advances, but it has come with a price. As these inherent, emergent difficulties necessarily cannot be solved by the methods which created them, it is time to re-engage with the complications and uncertainties of human life today and learn how to see beyond our reigning *topoi*. For as the world changes ideas, mentalities, and methodologies must change with it.

E.V. Walters, the self-professed *topologist,* was concerned with place and with how humans construct the physical places they live in. He wrote: "construction means enclosing space or building houses. Dilapidation literally means throwing down stones. We recognize unintended, natural dilapidation as the consequence of gravity and decay. Other kinds of dilapidation make ruins by deliberate acts – for example, as military forces raze places."[210]

Henri Poincare (1854-1912), one of the most influential scientists and thinkers of the late nineteenth and early twentieth century, was concerned with science and scientific theory. He wrote: "Orderly arrangement is the task of the scientist. A science is built out of facts just as a house is built out of bricks. But a mere collection of facts cannot be called a science any more than a pile of bricks can be called a house."[211]

Caroline Levine is a literary theorist concerned with forms and how these shape our lives. She wrote of Argentinian writer Jorge Luis Borges' (1899-1986) short story "Funes the Memorious": "Incapable of 'ideas of the general, Platonic sort,' the character of Funes invites us to ask if it is possible to refuse formalist abstractions in favour of particularities. How particular can we be? And how can we make arguments at all without abstract concepts to contain the potentially endless diversity of experience?"[212]

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[210] Walters, *Placeways,* 144.

[211] Hanson, *Patterns of Discovery*, 184.

[212] Levine, *Forms,* 35.

Throwing stones results in physical dilapidation; throwing facts results in intellectual dilapidation. Talking only in particulars is not talking at all, it is throwing verbal stones, and this too results in intellectual dilapidation. One cannot build a house by throwing stones on the ground, one cannot create a scientific theory by throwing facts on paper, and one cannot live free from a constant and rigorous engagement with multiple levels of abstraction. To live without this ongoing dialectic between the multiple levels of abstraction and the empirical facts of existence is to live in a state of intellectual dilapidation. As Walters states, the military razes physical places and creates ruins and wreckage. Human beings raze intellectual places and the result is the same.

The next step is to re-embrace abstract conceptualization in a holistic manner. By this I do not mean the abandonment of rational thought, the collection and analysis of empirical data, or anything of that nature. I mean learning how to look at the world and human's place in it with a depth of abstraction and conceptualization that allows humanity to move past crass reductionism and isolationism and into a deeper understanding of the world and human kind's place in it.

The casting-away as unimportant that which does not fit into your framework is an act of intellectual dilapidation. The Scientific Revolution and the Enlightenment, for all their merits, were acts of intellectual dilapidation. To free ourselves from their aged presuppositions and tired conceptual foundations, it is necessary that we reconceptualise our relationship to the world, to one another, and to philosophy, learning in the process how to confront our past in a new way. As Theodor Adorno and Max Horkheimer state in the introduction to *Dialectic of Enlightenment*:

> It is characteristic of the sickness that even the best-intentioned reformer who uses an impoverished and debased language to recommend renewal, by his adoption of the insidious mode of categorization and the bad philosophy it conceals, strengthens the very power of the established order he is trying to break. False clarity is only another name for myth; and myth has always been obscure and enlightening at one and the same time: always using the devices of familiarity and straightforward dismissal to avoid the labour of conceptualization.[213]

[213] Theodor Adorno and Max Horkheimer, *Dialectic of Enlightenment,* trans. John Cumming, (London: Verso Books, 2016), xiv.

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