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Nietzsche and the Aestheticization of the Natural Sciences

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DEDICATION

To Erynn McConnell and Sarah Martínez: two lessons concerning artistic impulse, scientific analysis, and the need for a Socrates who can play music; or, *zwei lektionen aus der Kriegsschule des Lebens*.

NIETZSCHE AND THE AESTHETICIZATION OF THE NATURAL SCIENCES

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THESIS

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ABSTRACT

This thesis is an exploration of Friedrich Nietzsche's dictum that life only justifies itself aesthetically. Given his attempt to physiologize aesthetics, this project attempts to show the value of the parallels and reciprocities between taste, style, beauty, and good health for scientists – especially natural scientists. It hopes to show something valuable about what late-modern scientific practice lost, especially in the context of the departmentalization of the sciences in universities. Specifically, I argue, disentangling scientific practice from philosophical concerns – the death of what used to be natural philosophy – has resulted in worse scientists, worse scientific practice, and a worse world. Without any regard for questions of taste, scientists can neither discriminate well about the projects attractive enough to pursue nor fully appreciate the stuff of their investigations. Good taste hinges only on good style; without knowing how to give to the world, i.e., how to create well, one does not have a good handle on the creative process behind the stuff of one's investigation. Good style hinges on a harmonious arrangement of one's constituent elements, be they features of the face or facets of the soul; good style hinges on beauty. Beauty hinges on the good health necessary to assimilate only what is good for one, that is, it hinges on good taste. The discipline necessary to invest in the aesthetic circle faces a threat in the professional world's increased demand for specialization – the demand that one aspect of one's life become too dominant with regard to the other aspects of one's life. The aesthetic circle requires a rejection of conventional values like job security and money, but such a rejection, counter-intuitively, will benefit those who make it through living a virtuous life. It also benefits the world more as a more-sustainable and more-inspiring project than *de rigueur* nihilism or hedonism.

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INTRODUCTION

In *The Birth of Tragedy,* Friedrich Nietzsche famously claims that "only as an aesthetic phenomenon are existence and life eternally justified."[1] He goes on to elaborate his account of Attic Greek culture as the spectrum of two idealizations of artistic impulse: the Apollinian, which concerns restraint, being, form, and tends to cash out in terms of plastic arts like painting and sculpture; and the Dionysian, which concerns frenzy, becoming, dynamics, and tends to cash out in terms of kinetic arts like music and dance. Nietzsche seeks to dispel a common conception of aesthetics as the "readily dispensable tinkling of bells that accompanies the 'seriousness of life.' "[2] To do so, he contraposes aesthetics, and specifically creative artistic impulse, with the spirit of science (the "seriousness of life"), which he sees as destructive and ushered in by Socrates and his *daimonion*.[3] Nietzsche's point is that science (*Wissenschaft*) as a systematic, eventually complete "knowledge" is a doomed project, always forced into contradictions that necessitate re-modeling to continue; thus, science always needs art to sustain itself – always is art, though one that has forgotten that it is.

As a result, Nietzsche concludes that we need a musical or "artistic Socrates" – what he would later call a "*fröhliche Wissenschaft*" (gay science).[4] That is, if science is a practice of constructing finite models as representations of an infinitely rich world – an artistic practice, broadly – then it stands to benefit from aesthetic concerns like style, taste, and beauty. This project, then, is an elaboration of Nietzsche's account of the misguided direction – the misguided values – of scientific practice as well as an elaboration of Nietzschean aesthetics with the aim of improving the sciences. While the aesthetic values that I offer as alternatives to those of typical

[1] Friedrich Nietzsche, *The Birth of Tragedy: or, Hellenism and Pessimism*, trans. Walter Kaufmann (New York: Vintage, 1967), 52.
[2] Ibid., 31.
[3] Ibid., 95.
[4] Ibid., 93.

scientists are applicable to the formal, social, and natural sciences, I stress the latter, for, as I argue, its project is potentially the least sustainable. With the natural sciences, the case is the clearest that typical scientific values – explanatory power, knowledge for its own sake, money, and especially the "greatest good" with which it tends to justify its funding – are not merely different from those of Nietzsche and aesthetics in general; rather, they are themselves inconsistent.

I begin Chapter 1 with a brief survey of the scientists that he himself read; this is how an elaboration of a Nietzschean critique of the sciences should begin – by seeing the problem and the promise of alternative through his eyes. My own reading of Nietzsche's philosophy of science, later confirmed by major Nietzsche scholar Walter Kaufmann, is of science simply as experiment. "[S]cience," Kaufmann contends, "is for Nietzsche not a finished and impersonal system, but a passionate quest for knowledge, an unceasing series of courageous experiments – small experiments, lacking in glamour and apparent grandeur."[5] A very-prominent theme today concerns the crises facing the sciences. Science is "on the verge."[6] Epistemically, the sciences rely on underpinnings – de facto physicalism, de jure empiricism, notions of objectivity (or at least intersubjectivity) – that it keeps from philosophy, from which it has long parted ways. These presuppositions are subject to increasingly sophisticated rational scrutiny – more and more "courageous [thought] experiments" – yet the sciences, contingently as we understand them today, must operate according to these rules; they are the name of the game. Problems with these working assumptions – among them problems with causality as a concept and the inescapability of perspectival situatedness – have contributed to the ongoing epistemic crisis. Increasingly diverse perspectives in the sciences have led to increased results that are incompatible with one

[5] Walter Kaufmann, *Nietzsche: Philosopher, Psychologist, Antichrist*, (New York: Vintage, 1968), 90.
[6] *Science on the Verge* (Consortium for Science, Policy, & Outcomes, 2016).

another, only to support competing political positions.[7] To this end, I offer a Nietzschean critique of the notion of objectivity, which remains a widespread and valued belief that stimulates scientific competition – a particular manifestation of competing wills to power.

In Chapter 2, I illuminate the frequent downside of scientific competition – Nietzschean *Eris* rather than *Neid*. Ethically, this unhealthy form of competition leads to dubious behavior on the part of scientists. The (especially natural) sciences are increasingly big technosciences, which require so much funding that the state is, by and large, the only source wealthy enough to fund it. One result of this current model of scientific practice is the "publish or perish" truism: (usually state) funders force scientists to justify their funding through peer-reviewed findings. This pressure encourages scientists to make compromised decisions to keep their jobs. These epistemic and ethical problems, I argue, are grounded in the academic divorce between the sciences and philosophy. Here, I sketch a genealogical account of the rise of the contemporary Humboldtian model of higher education, what it has meant for the sciences. Through departmentalization, scientists are becoming more dogmatic and less self-critical. Metaphysical truths are indemonstrable, artistic truths are often personal (thus dubious grounds for truth at all in a scientistic world), and theological truths dwindle more and more according to a famous old diagnosis.[8] On the other hand, being dependent on funding, itself from sources with diverse (evaluative) perspectives, scientists produce what Daniel Sarewitz has called "an excess of objectivity."[9] The world is infinitely rich, as I will argue, and that entails that competing

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[7] "Rather than resolving political debate, science often becomes ammunition in partisan squabbling, mobilized selectivity by contending sides to bolster their positions. . . . In such cases, the scientific experts on each side of the controversy effectively cancel each other out, and the more powerful political or economic interests prevail." Daniel Sarewitz, "Science and Environmental Policy: An Excess of Objectivity," in *Earth Matters: The Earth Sciences, Philosophy, and the Claims of Community*, eds. Robert Frodeman & Victor R. Baker (New York: Prentice-Hall, 2000), 83.

[8] "Gott ist tot!" Friedrich Nietzsche, *Thus Spoke Zarathustra: A Book for All and None*, in *The Portable Nietzsche*, trans. Walter Kaufmann, (New York: Viking, 1969), 124.

[9] Sarewitz, "Excess," 79-98.

perspectives can produce "good work" regarding the same phenomena but as mutually contradictory accounts.[10] The result is a growing suspicion among laypeople who are savvy enough to know of the compromising financial origins of scientific findings who become liberated to believe whatever they want. Flat-Earthers, anti-vaxxers, moon-landing deniers, and climate-change skeptics, among others, are on the rise. If science was our only source of truth, and if it is losing its persuasive power, then nihilism is irrupting. A silver lining is that there is room for an alternative value – namely, as I argue, Nietzschean style, which has implications for an alternative account of what scientific education can be.

I am far from the first to suggest philosophical solutions to the problem of scientific progress. Many have made cases for greater roles from ethics, phenomenology, hermeneutics, epistemology, and metaphysics; however, in Chapter 3, I believe I offer a fairly novel account for why aesthetics, particularly those of Friedrich Nietzsche, may solve the scientific crisis and benefit scientists as well as laypeople. before offering a Nietzschean aesthetic account of Nietzsche's exemplary scientist: Johann Wolfgang von Goethe. I argue that Goethe provides a better alternative to the conventional scientific practitioner (the specialist). Specifically, I argue for the greater role of taste in the natural sciences. I.E., greater discrimination regarding the stuff of scientific investigation can return the sciences to a healthier form of contest. A space for greater multi-disciplinarity – for *der kunstschaftler*, scientists and artists in the older, broader senses, endowed with know-how rather than merely knowing – can cultivate better, healthier scientists. Such an alternative space, I argue, is also necessary to keep ideas and practices stimulated and to keep the current scientific project, the so-called Internet of Things, sustainable

[10] "Geologists struggle to piece together a historical record of atmospheric change, but there is little that they can say about causation, because the details of the complex climate system have been erased by time. Atmospheric scientists, in contrast, are awash in detailed observation and bolstered by theory, but they can never validate their models because climate is an open system, and is therefore unpredictable. The views achieved by these two approaches cannot necessarily be integrated." Sarewitz, "Excess," 87.

– a major ostensible goal of the natural sciences today.

CHAPTER 1: 19TH CENTURY SCIENCE: NIETZSCHE AND DARWIN'S CONTEST

I start my account of Nietzsche's philosophy of science – as well as the need for its aesthetic supplement – with a brief literature review of the sciences (*Wissenschaften*) of Nietzsche's day. A handful of secondary sources that enumerate Nietzsche's scientific understanding inform my own; Charles H. Pence,[11] Christian J. Emden,[12] and Babette Babich[13] all list some of the most-influential scientists for Nietzsche. Similarly, Thomas H. Brobjer has compiled an extremely helpful table of Nietzsche's personal readings in the last years of his productive life (in addition to providing helpful analysis along those lines).[14] My own model of Nietzsche's scientific community, then, is a composite based largely on the rate at which figures appear repeatedly in the secondary literature. In this way, I hope that summaries of the works by the figures whom Nietzsche knew best will constitute a good picture of the sciences of the late-nineteenth century. Only then can I attempt a characterization of nineteenth-century science as such.

I. A Brief Survey of Nietzsche's Sciences

To begin, Wilhelm Roux's embryology worked to inform Nietzsche's understanding of physiology in general. An English translation of Roux' masterwork *Der Kampf der Teile im Organismus* ("The Struggle of the Parts in the Organism") is still absent, and my German is insufficient; hence, Lukas Soderstrom's account of Roux's work in "Nietzsche As a Reader of Wilhelm Roux, or the Physiology of History" will suffice. For Soderstrom's Roux, the development of an organism follows corresponding stimuli or excitations. Usually, these stimuli

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[11] Charles H. Pence, "Nietzsche's Aesthetic Critique of Darwin," *History and Philosophy of the Life Sciences*, Vol. 33, No. 2., (2011), 168.
[12] Christian J. Emden, *Nietzsche's Naturalism: Philosophy and the Life Sciences in the Nineteenth Century*, (Cambridge: Cambridge University Press, 2014), 2.
[13] Babette Babich, "Nietzsche and/or/versus Darwin," *Common Knowledge*, Vol. 20, No. 3, (2014), 406.
[14] Thomas H. Brobjer, "Nietzsche's Reading and Private Library, 1885-1889," in *Journal of the History of Ideas*, Vol. 58, No. 4, (Oct. 1997), pp. 663-93.

are nutrients. As new cells emerge in an organism, they and their already-established neighboring cells compete to assimilate exciting nutrients. As older and already-established, they have an assimilative edge over their newer counterparts; however, the spatial and biochemical directness of the exciting nutrients also plays a role in how the respective cells will react. Whichever cell is successful, it will expend its current stores to make room for the nutrients in question. Then, the cell engages in an "overcompensatory assimilation" of the exciting nutrients. It gains everything it lost in terms of the nutrients or energy that it expended and more, growing both in terms of space and power. Given the proximity to other cells, Soderstrom's Roux sees the power-based contractions and expansions of antagonistic cells at work within the organism and successful over-compensatory assimilation as a positive-feedback loop; as a cell grows (increases in size and power), its future ability to outcompete its neighboring cells in assimilating other nutrients also grows. The cycle of excitation, over-compensatory assimilation, and growth is at play not only among cells but among all other levels of organization within the organism, namely organs themselves and tissues (the muscle that, after the stimulus of the weight, expends by tearing only to grow in size and power and muscle out its neighbors). With this account, Soderstrom's Roux has a purposeful yet atelic picture of organic growth culminating in "harmony and strength by working toward the formation of the body's purposeful structure."[15] Constituent parts (cells, tissues, organs) grow dominant, supplicate themselves to neighboring parts, or disappear entirely, resulting, for Nietzsche, in an "aristocracy of cells" or cellular *Rangordnung*.[16]

In Jean-Baptiste Lamarck's *Zoological Philosophy*, Lamarck offers his account of the evolution of species through the influence or effect that their respective environments exert on

[15] Lukas Soderstrom, "Nietzsche As a Reader of Wilhelm Roux, or the Physiology of History," *Symposium: Canadian Journal of Continental Philosophy*, Vol. 13, No. 2, (2009), 55-67.
[16] Ibid., 61.

them. For Lamarck, "great alterations in the environment of animals lead to great alterations in their needs, and these alterations in their needs necessarily lead to others in their activities. Now if the new needs become permanent, the animals then adopt new habits which last as long as the needs that evoked them."[17] The best-known of Lamarck's several examples to illustrate his preceding thesis involves the giraffe. On Lamarck's account, the giraffe's environment, being arid and relatively sparse with vegetation, impresses a particular need upon the giraffe – that it exert itself to procure enough vegetation to eat in order to continue to live. More specifically, the relative sparsity of vegetation, owing to the environment's climate, compels the giraffe to stretch its neck and forelegs, however slightly, in order to procure some of the only available leaves. This action of slight stretching, on Lamarck's account, becomes habituated for the giraffe given the continuing aridity and vegetative sparsity. "Habits form a second nature," Lamarck continues, which, when present in a mating male and female of a species, "is subsequently preserved by reproduction . . . for the propagation of their species. Such a change is thus handed on to all succeeding individuals in the same environment, without their having to acquire it in the same way that it was actually created."[18] Lamarck, then, draws a parallel between the perceptible changes through (dis)use of organs in a specimen and the imperceptible changes that are to correspond in a species resulting in its evolution. Richard Schacht has recently sketched well the influence that the agonistic role between environment and species in Lamarck's zoology had on Nietzsche's mature philosophy.[19]With Schacht's account of Nietzsche's Lamarckism, an important transitional point arises. Much of Nietzsche's project is "to translate man back into

[17] Jean-Baptiste Lamarck, *Zoological Philosophy: An Exposition with Regard to the Natural History of Animals*, in *19th Century Science: An Anthology*, trans. High Elliot, ed. A.S. Weber (Toronto: Broadview, 2000), 51.
[18] Ibid., 55, 63.
[19] "It is a matter of what the offspring of the previous generation bring with them into this world as part of their inherited constitution, as modified by the trait-cultivation practices brought to bear upon their forebears" sums up

nature," by which he means to physiologize our most-human cultural fruits – ethics, aesthetics, metaphysics, religion, politics, science.[20] Importantly, then, Nietzsche seeks to demystify much of what we find special about ourselves, and this humbling task takes the form of uniting the natural sciences, especially biology and chemistry, and the then-emerging social sciences. That is, while even the then-emerging psychologists were increasingly providing accounts of ethics[21] and aesthetics, Nietzsche saw himself alone, erroneously, in attempting a physiology of psychology[22], attempting to dispel the last shadow of a doubt – the mind/body distinction – that we are more, higher, or of different origin than the rest of the living world by grounding even psychology in physiological terms. While the thrust of my argument will have for its target today's natural sciences (given that their invasive practices are potentially and actually much more destructive and less sustainable than those of the social sciences), it behooves me to treat briefly some of the social scientists with whose work Nietzsche was acquainted. As I will show, Nietzsche saw the same fundamental interplay undergirding the stuff of natural scientific and social scientific inquiries; thus, he saw the same promise in, and leveled the same critiques against, natural and social scientists who, on his view, are fundamentally the same types of investigators.

August Comte, the father of positivism and of sociology in the modern sense, exists alongside Aristotle, Francis Bacon, and René Descartes as one of "[t]he great methodologists" by that will save the world from chaos and provide for greater human welfare; he thinks that

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neatly the Lamarckian role in Nietzsche's cultural and, broadly, genetic concerns. Richard Schacht, "Nietzsche and Lamarckism," in *Journal of Nietzsche Studies*, Vol. 44, No. 2, (Summer 2013), 270.

[20] Friedrich Nietzsche, *Beyond Good and Evil: Prelude to a Philosophy of the Future*, trans. Walter Kaufmann (New York: Vintage, 1966), 161.

[21] Importantly, Paul Rée's *The Origin of the Moral Sensations* was the work to which Nietzsche had never said "no," sentence by sentence and deduction by deduction, so thoroughly, enough for him to write his self-described polemic (see below).

[22] Friedrich Nietzsche, *On the Genealogy of Morals: A Polemic*, trans. Walter Kaufmann, (New York: Vintage, 1967), 55, 112.

positivism, his unifying science of sciences, must be that single homogeneous doctrinal body.[23] While Nietzsche is in agreement that the "cockcrow" of positivism marks an optimistic turning point from theology and metaphysics,[24] he is critical of Comte's systematizing and, as I shall argue, he is highly critical of the homogeneity that Comte prefers to chaos, as well.

Lamarck and Comte both served as influences for Herbert Spencer, whom many anachronistically credit as the father of social Darwinism. In his 1851 *Social Statics,* Spencer argues against state-funded welfare ("poor laws") along several lines. He begins by positing that government only exists to protect and that all legal rights are negative rights; thus, claims to a right to a social-safety net are erroneous, which bears out for Spencer in the widespread disagreement about the extent to which the alleged right is supposed to exist. He argues further that many whom the state taxes to fund the poor laws do not support the project, so said taxation is tantamount to theft. Moreover, given the choice between the state's coercing one to pay a tax to fund poor laws and reaping the benefits of them, the state inadvertently incentives people to depend on state welfare rather than to be productive. Most interestingly and most crucially, though, Spencer argues that sympathy, specifically the altruism that can result from a face-to-face relationship, is the basis for civilization, and by nationalizing giving, the state hinders social advancement. Rather, Spencer argues that personal giving – the unification of egoism and altruism that results from enjoying helping – helps others to help themselves, improving everyone's life as a result. For Spencer, poor laws prevent the human equivalent of "the sickly, the malformed, and the least fleet or powerful" from disappearing from the social equation, which prolongs their suffering rather than solving it.[25] Spencer then sees life under the state as a

[23] Ibid.

[24] Nadeem Hussain elaborates well Nietzsche's intellectual relationship with Comte in his "Nietzsche's Positivism," but Nietzsche's own "How the 'True World' Finally Became a Fable" illustrates well enough Nietzsche's critique even of what he likes in Comte. *Twilight of the Idols: How to Philosophize with a Hammer*, in *The Portable Nietzsche*, trans. Walter Kaufmann (New York: Viking, 1969). 485.

contest between citizens over the resource of money (as well as employment positions), as well as seeing the state itself as being in an antagonistic relationship with taxpayers whose actual negative rights he sees the state violating. Nietzsche also questions the value of prolonging bad lives and critiques begging along aesthetic lines, but Spencer's emphasis on altruism and strong support from the petit bourgeois leads to Nietzsche's frequent dismissal of Spencer's "shopkeeper philosophy."[26]

II. Scientific Struggle and Nietzsche's Will to Power

The overall character of the nineteenth-century sciences that emerges, from the smallest cellular level to the grandest social, is that of contest. If this survey is indicative of Nietzsche's own understanding of the sciences in his time, then he saw cells, organs, tissues, and organisms themselves, including people, in various states of contest with one another, with their environments, and in our case, with their social, political, and economic institutions. While Comte argued that "the ultimate perfection of the Positive system would be (if such perfection could be hoped for) to represent all phenomena as particular aspects of a single general fact," he concedes that "[t]here is something so chimerical in attempts at universal explanation by a single law . . . Our intellectual resources are too narrow, and the universe is too complex, to leave any hope that it will ever be within our power to carry scientific perfection to its last degree of simplicity."[27] Here, Nietzsche must have thought that he surpassed Comte with what Walter Kaufmann calls "the assumption of a single basic principle" in Nietzsche's mature philosophy: the will to power.[28] Nietzsche himself, in the final note of the unpublished work of the same name, asks, "And do you know what 'the world' is to me?" before answering, "*This world is the*

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[25] Herbert Spencer, *Social Statics: or, The Conditions Essential to Human Happiness Specified, and the First of Them Developed*, in *19th Century Science*, 192-201.
[26] Nietzsche, *The Will to Power*, 206, 479, 498.
[27] Comte, *Positive Philosophy*, 206, 213.
[28] Kaufmann, *Nietzsche: Philosopher, Psychologist, Antichrist*, 178.

will to power – and nothing besides! And you yourselves are also this will to power – and nothing besides!"[29]

Nietzsche's will to power (*Wille zur Macht*) is, in the most-general terms, the (re)active expanding and contracting, whether literal or figurative, of any constituent elements in question, with regard to one another. Here, analysis of the phrase might be necessary. By "willing," Nietzsche does not mean intention, motivation, or impotent desire. Nietzsche's willing is pure activity, i.e., one only wills what one actually does, and only while doing it. More importantly, Nietzsche has opted for the German *Macht*, which refers to power in the broadest sense that we ever mean "power" – almost as "energy." Illustrating the universality of this principle for Nietzsche, he did not opt for *Kraft* (a physical forcing) or *Zwingt* (a coercing), two other common translations of "power," because these are merely two of the contingent expressions of the basic *Macht*. Forcing and coercing are ways that the will to power manifests itself, but these particular manifestations are incidental. Most importantly, these different manifestations (*Kraft und Zwingt*) point to the seemingly innocuous yet crucial preposition *zur*. Although the English translation of "*Wille zur Macht*" is always "Will to Power," *zur* is variously translated as "to," "for," or "of." The preposition denotes a possessive relationship between two nouns; hence, a cap can equally be to, for, or of its corresponding bottle.

I argue that the ambiguity here is crucial for understanding Nietzsche's concept and designation, for fundamentally, *der Wille zur Macht* always assumes either an active or reactive flavor. For example, the deliberation that coercion implies betrays an emptiness. Like a hollow amoeba, one knows, at least subconsciously, that one lacks something, so one sets out to assimilate it from a different point in its proximity. The amoeba expands, but something else – a competing point – shrinks or disappears entirely. By contrast, physical force need not be, and

[29] Nietzsche, *The Will to Power*, 549-50.

often is not, deliberate. In such a case, the power in question is not a reaction, despite how we usually think of it, but on Nietzsche's account pure action. If a fat orange could squeeze itself, then the active expression would be not a will *to* power – an admission of a lack of power – but a will *of* power. The orange shrinks, and some lucky mouth profits by filling itself; however, this is only possible because the orange had a fullness to express in the first place. One can never squeeze a dry, withered orange, and by definition, one cannot want (will to) what one already has in abundance. Similarly, one acts by speaking and another reacts by listening; both act and react either to gather or to discharge one or another form of power. It is in this way that Nietzsche thinks that he has succeeded in translating humanity back into nature.

If Schacht is right in characterizing Nietzsche as a scientian (one informed healthily by the sciences) but as not scientistic (with an unhealthy, dogmatic faith in them),[30] then the large degree to which he learned about the sciences of his day would go a long way toward understanding his fundamental, universal principle (*Wille zur Macht*) as an agonistic one. If "[t]he world viewed from inside, the world defined and determined by its 'intelligible character' – it would be 'will to power' and nothing else,"[31] and Nietzsche seeks to undermine our collective belief in our own specialness, then a view of the natural (and by extension, the burgeoning social) sciences as being the same kind of contestation would inform and serve that project. Importantly, though, it may be worth wondering whether Comte was correct after all – whether the world is too rich, and our thinking faculty too weak to reduce *successfully* the world to a single general principle. By capturing all of the world as will to power, Nietzsche may be capturing none of it at all. If Nietzsche can characterize both my helping an old lady to cross a street and my mugging her as "will to power," then one starts to suspect that the phrase has no

[30] Schacht, "Nietzsche's Lamarckism," 278.
[31] Nietzsche, *Beyond Good and Evil*, 48.

meaning whatsoever. *Der Wille zur Macht*, Nietzsche's fundamental "metaphysical"[32] principle, may promise too much and subsequently deliver nothing. Of course, Nietzsche would reject this concern as an insistence on bivalent logic, which he in turn rejects, as I show in Chapter 3.

III. Objectivity and "Objectivity"

Nietzsche occupies a rare position among scholars of the 1870s and 1880s. Broadly, he found in his day neo-Kantian philosophers, who stressed the role that one's perception plays in shaping the mind-independent, noumenal world into the phenomenal world of appearance, leaving the thing in itself (*ding-an-sich*) unknowable. On the other hand, he found budding natural sciences – e.g., physicists, chemists, biologists – who stressed that the organs responsible for the phenomenal world were made up of, informed by, the same kind of mind-independent stuff that they perceive. Nietzsche, true to form, criticized each camp for ignoring the truth of the other. He discloses his position most clearly in Section 15 of *Beyond Good and Evil*:

> To study physiology with a clear conscience, one must insist that the sense organs are *not* phenomena in the sense of idealistic philosophy; as such they could not be causes! . . . And others even say that the external world is the work of our organs? But then our body, as a part of this external world, would be the work of our organs! But then our organs themselves would be – the work of our organs! It seems to me that this is a complete *reductio ad absurdum*, assuming that the concept of a *causa sui* is something fundamentally absurd. Consequently, the external world is not the work of our organs–?[33]

Nietzsche is highlighting the seeming paradox that results from accepting the theses of the neo-Kantians and of the natural scientists. Our sense organs shape the world that they sense, per the neo-Kantians, but they are made of the same kind of stuff of the world that they sense, per the natural scientists; thus we shape ourselves, and as part of the physical world, the physical world

[32] Accurately describing many of Nietzsche's positions is difficult if not impossible. Here, the scare quotes are warranted given that, strictly speaking, Nietzsche rejects the notion of *ta meta ta physika* – the beyond the physical. In the context of his will to power, I refer to it as a metaphysical principle in only the broadest sense of the word: it is a principle within the major branch of philosophy concerned with reality.

[33] Nietzsche, *Beyond Good and Evil*, 22-3.

shapes itself. Through us, the world experiences itself experiencing itself. Seemingly, the physical stuff that makes up or sense organs would have to exist prior to our sense organs shaping the world, yet how our sense organs have shaped the world would inform how physical stuff (including that stuff that makes up our sense organs) shapes the sense organs – shapes the shapers. If both theses are true, then the process of shaping the world shapes itself; the final question-mark is Nietzsche's comedic-ironic stamp.

On its face, Nietzsche rejects the simultaneity of truth in the neo-Kantian and naturalist theses – the *causa sui* being "fundamentally absurd"; however, Nietzsche's penchant for irony and for the esoteric – hiding text within text – makes the tenability of this literal read more difficult to establish. The "fundamental absurdity" of the *causa sui* – self-causing thing – is, for Nietzsche, not rooted in the apparent paradox of self-causation but in the nature of causation as such. He consistently posits causation as a fiction – a creation on our part that is sometimes useful and always necessary. In *The Gay Science* 112 (*Cause and Effect*), he argues that "as we describe things and their one after another, we learn to describe ourselves more and more precisely. Cause and effect: such a duality probably never exists; in truth we are confronted by a continuum out of which we isolate a couple of pieces, just as we perceive motion only as isolated points and then infer it without ever actually seeing it."[34] Elsewhere, he continues to argue along the same lines regarding the anthropomorphizing essence of causation, especially in the context of regulative norms.[35][36][37] In good Heraclitean fashion, Nietzsche's picture of the world is only as

[34] Friedrich Nietzsche, *The Gay Science*, trans. Walter Kaufmann (New York: Vintage, 1974), 173.
[35] "But thought is one thing, the deed is another, and the image of the deed still another: the wheel of causality does not roll between them," Friedrich Nietzsche, *Thus Spoke Zarathustra: A Book for All and None*, in *The Portable Nietzsche*, trans. Walter Kaufmann (New York: Viking, 1969), 150.
[36] "There is no 'being' behind doing, effecting, becoming; 'the doer' is merely a fiction added to the deed – the deed is everything," Nietzsche, *Genealogy*, 45.
[37] "Hume was right . . . That which gives the extraordinary firmness to our belief in causality is not the great habit of seeing one occurrence following another but our inability to interpret events otherwise than as events caused by intentions," Nietzsche, *The Will to Power*, 295.

flux, becoming; however, in good Cartesian fashion, Nietzsche acknowledges that the ways things seem to us do seem to us those ways. Our human constitution forces us to chop up the infinity of becoming into discrete pieces (lightning and flash, doer and deed, cause and effect) which serve us (or not) as fictions regarding how we can survive and thrive. These fictions are ours, though. The *a priori* account of causation that Immanuel Kant argues tells us something about ourselves (how we under-stand) but nothing about the world independent of ourselves.

The upshot is that Nietzsche actually embraces the paradox that results from accepting simultaneously the neo-Kantian and natural-scientific theses: the organs produce themselves, the world appears to itself (through us) without distinction between appearing and apperceiving; one does not cause the other. The *reductio ad absurdum*, a logical problem which Nietzsche is nowhere else concerned, illustrates a different point for him here. He accepts that, given contradictory premises in a bivalent logical system, an absurdity results; he accepts further that our sensory organs giving rise to and following from themselves is such an absurdity. What he does not accept is the typical conclusion: that we should dispense with the absurdity. His conclusion is that we should dispense with a dogmatic insistence on bivalent logic (and oppositional thinking – true and false, free and unfree, good and evil – generally).

Some natural scientists contemporary with Nietzsche also embraced the paradox regarding the sense organs[38] – both anthropomorphizing the physical world and physicalizing the anthropomorphizing process. Nietzsche saw himself as a pioneer in taking a further step: collapsing evaluation into the physical-anthropomorphic account of the world. "The question: what is the value of this or that table of values and 'morals?' should be viewed from the most divers[e] perspectives; for the problem 'value for what?' cannot be examined too subtly," he

[38] Ernst Mach was among these.

argues in *On the Genealogy of Morals*.[39] In that work, Nietzsche argues, among other things, for an historical and physiological (genealogical) account of values which, varying from eco-physiology to eco-physiology, he reduces broadly to terms of power (*Macht*): strength and weakness both physiologically and psychologically. Specific to my ends, he concludes that embracing oneself – one's thinking and evaluating, one's drives – is better than denying oneself. He makes this case according to his own standard of human evaluation: good health.[40]

In describing the paradox of the sense organs that Nietzsche saw, I hope to have made a case for the impossibility of objectivity, or dis-interested investigation. Our means of investigating are always situationally conditioned by their physical constitutions. Virchow illustrates the relevance of Nietzsche's critique thusly: "I have been teaching my science for more than thirty years, and I may say that in these thirty years I have honestly worked on myself, to do away with ever more of my subjective being and to steer myself ever more into objective waters. Nonetheless, I must openly confess that it has not been possible for me to de-subjectivize myself entirely."[41] While artists and philosophers, including philosophers of science, have come, to some degree, to accept the inevitability of our situated human perspectives, some natural scientists themselves – from big-picture geologists[42] to meticulous biologists[43] – maintain that the truths of the natural sciences are objective truths. This "objective" enterprise is a fool's errand two-fold. In the first place, as I have argued, objectivity in the sense here – disinterestedness or disembodied investigation – is an impossibility. In addition to one's remaining at all times embodied, the drive for "objectivity" itself betrays one's subjectivity; one

[39] Nietzsche, *Genealogy*, 55.
[40] Ibid, 38.
[41] Virchow, Rudolf, "Die Freiheit der Wissenschaften im modernen Staatsleben," in *Amtlicher Bericht über die Versammlung Deutscher Naturforscher und Ärtzte* 50 (Munich: Akademischen Buchdruckerei von F. Straub, 1877), 65–78
[42] Dr. James Kubicki, in discussion with the author, May 2018.
[43] Dr. Eli Greenbaum, in discussion with the author, May 2018.

willed on behalf of one's drive for "objectivity" – as obvious of an embodied interest as one could want. One could not have done otherwise.

At most, natural scientists can strive to minimize their respective interests; however, as Nietzsche would ask, what is the value of this value? The second dimension of the foolishness of the ascetic pursuit of "objectivity" lies in its bad evaluation. The drive to remove oneself, as investigator, from an investigation betrays a dissatisfaction with oneself, and the degree of the drive ("entirely") betrays the degree of the dissatisfaction, of the bad health. That is, we investigators, though perhaps still unknown to ourselves,[44] have better access to ourselves than any others do. A drive away from the self, away from one's drives, has the potential access to one's physiology that everyone else has, but uniquely, it has access to one's psychology – one's mental stuff. Having all of this access and striving away from the contents betrays something that the investigator does not like: the stuff one chooses to paint in the world; how one paints it; why one paints it. Alas, one cannot help but paint.

By "painting," here, I refer to a third sense of "objectivity" of which we frequently speak, which is as a critical self-reflection. If we grant the different flavors of our biases – our subconscious psychological drives, instincts, intuitions, and affects, all extra-rational – then we can still expect a certain reflexivity concerning this soul multiplicity. This is precisely, for Nietzsche, how we transform a "coil of wild snakes"[45] – an unruly cohort of conflicting psychological elements moving in different directions – into a harmoniously arranged soul. Calling objectivity a "fairy tale," he characterizes it as "an eye which cannot be thought at all, an eye turned in no direction at all, an eye where the active and interpretive powers are to be suppressed, absent . . . There is *only* a perspectival seeing, *only* a perspectival 'knowing'; the

[44] Nietzsche, *Genealogy*, 15.
[45] Nietzsche, *Zarathustra*, 151.

more affects we are able to put into words about a thing, the *more* eyes, various eyes we are able to use for the same thing, the more complete will be our 'concept' of the thing, our 'objectivity.' "[46] Nietzsche does not mean anything unusual to our lived experiences. We often talk of "rose-colored glasses," for instance. The analogy is apt. We imagine that someone is looking at the same stuff that we are; however, though the stuff bares a strong resemblance to what we see, their image – even if they occupy the same space and get the same vantage – is colored differently from those of us with "clear" lenses. As a result, their picture of the world is rosier than ours.

Nietzsche's point – his perspectivism – is that none of us are wearing clear glasses, exactly. Sometimes, the affects that shade our perspective are as obvious as literal rose-colored lenses would be. The times that are not obvious do not entail a lack of shading, though. They merely entail *subtler* shading. As a result, we can become aware of the different faculties that shade our perspectives (and how they do it) to the end of critically examining a perspective – through our other perspectives. To remember the different shades of lenses we have available to us, how the same stuff looks through each of them – sentimental, gloomy, frightful, disgusting, euphoric – and to consider all of them is to gain an "objectivity" that Nietzsche can support. More extreme, though, is Nietzsche's recognition that we may not all have the same collection of lenses. In "On Truth and Lies . . .," he remarks with how much confidence the gnat must view the world and its place in it – that the world fits neatly together with its gnat-like perspective.[47] His physiologizing project – translating us back into nature – entails that, like gnats, we do not get a choice in the collection of lenses we have available to us. Even the capacity to remember the different shades, and how we do so (not completely accurately) is not a set of lenses that all

[46] Nietzsche, *Genealogy*, 87.
[47] Friedrich Nietzsche, "On Truth and Lies in a Nonmoral Sense," *Ways of Reading: An Anthology for Writers*, Eds. David Bartholomae and Anthony Petrosky, (Boston: Bedford/St. Martin's, 2011), 452.

seers might have; however, since it is a set that we have, we can put it to good use.

IV. Darwin's Contest: Late Modernity and the Lost Value of *Neid*

If Nietzsche's will to power has some narrower value, then I argue that we find it in Nietzsche's early work. In his early unpublished essay "Homer's Contest," Nietzsche offers yet another particular expression of what he would go on to understand as the wills to and of power. In that early essay, Nietzsche draws the same distinction in Hesiod's "Works and Days" between two goddesses *Eris* (strife): one the ancient Greeks designate "as evil, namely the one who leads human beings to hostile fights of annihilation against one another," and one (*Neid*, who is good), "who as jealousy . . . provokes human beings to action – not to the action of fights of annihilation but rather to the action of *contests*."[48] Nietzsche goes on to elaborate the distinctions between these two deifications of strife and their respective roles. The former represents our usual understanding of strife, marked by what Nietzsche would go on to characterize as *ressentiment*. That is, this default manifestation of *Eris* represents the curdled form of an admission of superiority in another – be it aesthetically, fortunately, athletically, or scholastically. One finds another at a higher elevation than one finds oneself, and one is filled with an annihilative drive to tear that superior other down to one's own lower level. By contrast, *Neid* – the latter kind of strife – is a positive response to a perceived superior. In the presence of *Neid*, one who perceives oneself to be inferior to another finds in oneself a drive to lift oneself up to the perceived higher elevation of another. The aggressive tendency that Nietzsche sees us as sharing with the rest of the physical world is, in the presence of *Neid*, channeled into the best possible direction, wherein a potentially negative, destructive force becomes a positive, constructive one. One is awed by the superiority of another and, rather than becoming resentful, one becomes envious enough to drive

[48] Friedrich Nietzsche, "Homer's Contest," trans. Christa Davis Acampora, in *Nietzscheana* #5 (1996), 3.

oneself to betterment in the hopes of surpassing one's rival in friendly competition.[49]

The difference between the bad *Eris* and the good *Neid*, I argue, should sit alongside (but does not, explicitly) Kaufmann's "philosophy of [Nietzsche's] youth [that] was marked by a cleft that all but broke it in two" until Nietzsche's formulation of *Der Wille zur Macht*.[50] Nietzsche wrote "Homer's Contest" and thus made the distinction in 1872 – the same year that Nietzsche elaborated his Dionysian/Apollinian distinction in *The Birth of Tragedy*. The fit between the bad *Eris*/good *Neid* distinction and *Der Wille zur Macht*, specifically the will to power/will of power distinction, is relatively neat. The former is a case of seeing a neighbor's flourishing orange tree, festooned with fat oranges, and plotting to destroy them or sow those roots with salt. It is a case of a powerful lacking, even if only recognized subconsciously, that one seeks to address by destroying the exemplary cases by which one measures oneself inadequate. In the latter case (reified and deified by the good *Neid*), one sees the success of another – that neighbor's fat oranges – and finds in oneself a drive to best one's neighbor by improving one's own orange tree enough to surpass one's neighbor's. In both cases, there is a kind of agonistic relationship in which different force points (gardening neighbors) find themselves.

In the latter case, Nietzsche finds a much-healthier, much-more-fruitful alternative to the former; the latter results in more oranges not only for the two neighbors on the whole but for the community as well. The positive spirit of *Neid*, Nietzsche argues, spreads past the particular competitors to their community; she is, he thinks, a high tide that waters all orange trees. "Every Athenian," Nietzsche continues, "was supposed to develop himself in contests in order to be of the highest service to Athens and bring it the least harm. . . . [T]he youth thought of the well-being of his native city when he sang or threw or ran in contests; he wished to increase the city's

[49] Ibid., 1-8.
[50] Kaufmann, *Nietzsche: Philosopher, Psychologist, Antichrist*, 178.

share of glory by increasing his own glory."[51] This early distinction mirrors neatly, too, his later distinction between healthy and strong normative evaluations and unhealthy, weak ones – a different manifestation of *Der Wille zur Macht.* Whether healthy or unhealthy, one's attitudes will spread, physiologically, Nietzsche thinks, to those around one; thus, one has an imperative, insofar as one is capable of doing so, to express in a healthy way for the sake of influencing those surrounding one.

Ontically, it should not be surprising that Nietzsche sees these early particular idealizations of *Der Wille zur Macht* – bad *Eris* and good *Neid* – throughout the scientific writings of Nietzsche's time. In Wilhelm Roux, cells, tissues, and organs compete with one another for space and finite resources, e.g., nutrients. In some cases, weaker combatants are eliminated entirely through the *agon*; in others, weaker combatants successfully outmaneuver formerly superior ones and upset the existing physiological arrangement. At the level of the organism (on Jean-Baptiste Lamarck's account), the same sort contestation dichotomy plays out: the environment of a species at a given moment cruelly annihilates the species, driving it to extinction, or it encourages those specimens to best that environment in productive new ways. As Nietzsche reminds, too, "the 'natural' qualities and those properly called 'human' grow inseparably"; the fundamental truths of the natural sciences, on Nietzsche's account, extend to the social sciences.[52] The same contest, in August Comte's early sociology, bears out among competing ideas, which play out their contest at a nationalistic level. Further, they play out temporally as transitions from ideological epochs result in strife between different movements' representatives all trying to end the positions of the others, be they theologians, metaphysicians, or scientists. In Herbert Spencer's "shopkeeperdom," human individuals compete for the same

[51] Nietzsche, "Homer's Contest," 5-6.
[52] Ibid., 1.

finite political and economic resources; specifically, they assume different classes – rich producers and poor consumers – who destroy one another under the "poor laws" when, on his account, the rich could be inspiring the poor to bootstrap themselves into wealth.

Ontologically, though, there is also a contestation playing out between these respective scholars themselves. For reasons I elaborate in Chapter 2, educational reforms, pioneered by Wilhelm von Humboldt, take especial hold in the unified Germany of the Second Empire. Humboldt's educational reforms would extend well beyond Germany, throughout Europe and North America to the present day. As a result of the ensuing departmentalization of the state-funded university model, new disciplines, reflecting new specializations, emerged. Namely, psychology, sociology, and anthropology become distinct and formalized in ways that they had not previously been. Likewise, old kinds of investigations – those of investigators previously known as "natural philosophers" – became natural scientists in more-specific physics, chemistry, and biology departments, increasingly divorced from old metaphysical, epistemological, and evaluative concerns. More specifically, even these natural sciences splinter further: e.g., pathology, embryology, morphology, homology, and chemical thermodynamics all began to emerge as formal specializations.

Consequently, entirely new kinds of contests (as new disciplines) emerged, and so did a new degree of specificity for old concerns.[53] As with any contest, though, the contests of these new disciplines required shared rules and goals; a discus thrower is only in a meaningful contest amongst other discus throwers and not, e.g., among poets. As *Der Wissenschaftler*,[54] seekers of knowledge, the goal of their game was Truth – the referee that was to determine winners and

[53] Many of these new specializations have roots at least as far back as Aristotle; notably, in the Aristotelian context, though, they often assumed telic, otherwise metaphysical, or evaluative contexts that the emerging natural sciences were increasingly interested in jettisoning.
[54] scientists

losers along the lines of explanatory power. Eugen Dühring, a prominent scientist of the 1860s-80s whom Nietzsche read thoroughly,[55] perhaps best typifies the attitude of the day: "From the perspective of Dühring's self-proclaimed *Wirklichkeitsphilosophie* ['reality philosophy'], the logical structure of knowledge, together with the unity of scientific method, was inscribed into The world of material things, so that science, as he noted, simply 'corresponds to a real connection among things.' "[56] Any "realistic" philosophy, then, describes the relationship between human knowledge production – here exhausted by the unity of conventional (bi-valent) logic and the scientific method – which corresponds neatly with the natural world. Truth lies embedded in the world, and the power to gain Truth lies embedded in the special kind of beings that humans are; the natural world and human understanding fit together perfectly like puzzle pieces designed for one another. In turn, the shared goal of the emerging natural and social scientists cashed out in terms of explanatory power; the scientific theory that best fit with the observed phenomena, i.e., fit the most and the most-varied observed phenomena, would win the day. Nietzsche would point out that Dühring's perspective was his own, though; he had never seen the world other than as Eugen Dühring, and indeed he could not have. Made of the same kind of stuff as Nietzsche's gnat, we can imagine that Dühring is more confident; however, we cannot imagine that he is any more right about the narcissism of that human, all-too-human perspective.

A hitherto unmentioned natural scientist, whom Nietzsche almost certainly did not read,[57] would eventually go on to win the contest of the life sciences for many intents and purposes. Charles Darwin would give an account of the living world, unassumingly, the broad strokes of which must be accepted by biologists today lest they face the *ostrakon* of academia. In

[55] Brobjer, "Nietzsche's Reading" 667, 682-3.
[56] Emden, *Nietzsche's Naturalism*, 29.
[57] Pence, "Nietzsche's Aesthetic Critique" 168.

Darwinism, understood in the broadest terms, one sees the downside even of the good strife, *Neid*: "The original function of this strange institution [ostracization] is . . . as a means of stimulation: one removes individuals who tower over the others only to reawaken the play of powers . . . Why should no one be the best? Because with that the contest would dry up," Nietzsche argues.[58] Given the fixed goal of Truth (i.e., explanatory power), contemporary Darwinism, supplemented with Mendelian genetics and the double-helix DNA structure of Francis Crick, James Watson, and Rosalind Franklin, has become almost peerless in the annals of observed phenomenal support. Biologists will attest that the broad strokes of Darwinism – the struggle to continue to exist long enough to mate that drives species change, including to the point of species origination – is among the best-supported scientific theories in terms of observed and predictable phenomena.

This profound achievement, counterintuitive in its intellectual barrenness, was not without precedent. Nietzsche cites athletic and political examples, but he also mentions Aristotle,[59] whose physics towered over Europe for almost two millennia – until the great, revolutionary methodologists Bacon and Descartes – and the great experimenter Galileo Galilei. Importantly, though, Aristotelian physics was still joined to Aristotelian philosophy: metaphysics, epistemology, and especially value theory. When natural philosophy became the natural sciences, these new disciplines divorced themselves from the power of critical self-reflection that they had. With the liberation of the sciences from philosophy came the liberation of the sciences from the critical ability to question the goal of the contest – the value of the contestation – in which its practitioners participated. The power to question the most deeply held presuppositions of scientific practice largely left the people who had the most value for, and

[58] Nietzsche, "Homer's Contest," 5.
[59] This passing reference is with regard to accepting the bad *Eris*/good *Neid* distinction, and noting an extraordinary further conclusion: the dead, too, can sometimes spurn a living person on to a sense of contestation. Ibid., 4-5.

responsibility to, critical self-reflection. In Chapter 2, I elaborate an argument for how Humboldtian educational and academic reforms, of which Nietzsche was keenly aware and critical, facilitated the disastrous turn for the sciences that, while cementing Darwin's legacy, cements a scientific paradigm; thus, formalized science becomes, in Nietzsche's estimation, unscientific – that is, un-experimental. The power to stimulate again the scientific contest has, for the time being, fled the scientific contestants.

CHAPTER 2: POST-NIETZSCHE: ACADEMIA AND A PROMISE OF STYLE

From 1809 to 1810, Wilhelm von Humboldt modernized the higher-education system as the Prussian Minister of Education. In that year and a half, Humboldt "reformed school education to provide free and compulsory primary and secondary education, and founded the first university in Berlin, now known as the Humboldt University."[60] It was not until the birth of the Second Empire, in 1870, that Humboldt's educational reforms became widespread. The Franco-Prussian war (1870-1) results, for the first time, in a unified Germany under Wilhelm I and Otto von Bismarck and the founding of the third French Republic following the defeat of Napoléon III. One sees the annihilative lust between the German and French combatants – their reciprocal desires to destroy competing political, economic, and military bodies. On the other hand, one can see the cooperative *Rangordnung* of political bodies working to order themselves properly for a greater good – bad *Eris* and good *Neid*, or wills to and of power, respectively. Under Bismarck, though, Humboldt's reforms "achieved the exact opposite of what was originally intended."[61] Around the same time, Nietzsche began his own professorial career at Basel. Immediately, Nietzsche rejects the neo-humanist spirit of Humboldt's reforms, arguing that students are "left to their own devices without leadership, discipline, and order."[62] As I intend to show, this criticism of Nietzsche's amounts, to him, to a question of pedagogical style. Humboldt succeeded in his goal to create a state (as opposed to national) education – one in which public funding ensures widespread access. The price, Nietzsche thinks, has become the uniformization of higher education and the loss of what makes education special; education

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[60] Barry Stocker, "A Comparison of Friedrich Nietzsche and Wilhelm von Humboldt as Products of Classical Liberalism," in *Nietzsche as Political Philosopher*, eds. Manuel Knoll and Barry Stocker (2014), 140.
[61] Tomislav Zelić, "*Bildung* and the Historical and Genealogical Critique of Contemporary Culture: Wilhelm von Humboldt's Neo-Humanistic Theory of *Bildung* and Nietzsche's Critique of Neo-Humanistic Ideas in Classical Philology and Education," in *Educational Philosophy and Theory*, Vol. 50, Nos. 6-7 (2018), 662.
[62] Ibid., 665.

assumes a bad style.

I. Wilhelm von Humboldt: Educational Reform and Academic *Eris*

Friedrich Schleiermacher, a peer of Humboldt's, outlines the Humboldtian model as consisting of three unities:

> The *unity of teachers and learners*[; t]he concept of the *unity of research and teaching* [which] pertains to the communication of knowledge, and involves a kind of re-creation of the processes that produced it. Teaching and research should go hand in hand[; and i]n the *unity of knowledge* all branches of knowledge are regarded as admitting of only of one unified spirit bound together by reason . . . It is philosophy which is the supreme integrative discipline embracing nature and history, the empirical and the speculative – the whole of knowledge in its organic integrity.[63]

The unity of teachers and learners provides an idealized dialogical teaching-and-learning dynamic. The unity of research and teaching is the germ of the current publishing process. The re-creation to which Schleiermacher refers is the building-upon of academic research – comparing existing work to the end of new work. The unity of knowledge concerns the departmentalization of the university. The increasing precision of technology and the corresponding growth in knowledge production led to the increased demarcation of fields of inquiry. Scientists increasingly had fields of inquiry rich and complex enough with which to occupy themselves; however, Schleiermacher was clear that philosophy was not to be a department alongside the other departments. He insisted that the mother of disciplines should remain the lattice that lies across all others.

As Michael Dobbins and Christoph Knill explain, "Founded upon Humboldt's principles, the *model of self-governing communities of scholars* implies weak university management and strong professorial dominance and collegial control. The model ideally is based on a state–

[63] Rosalind Pritchard, "Humboldtian Values in a Changing World: Staff and Students in German Universities," in *Oxford Review of Education*, 30.4 (2004), 510.

university partnership. . . . This limits self-governance."[64] As Humboldt imagined things, faculty members should be the primary determiners of teaching and learning; however, as greater educational access to the people was contingent on state funding, the state demanded certain results in exchange for its tax dollars. Since the Humboldtian model's beginnings, state involvement, with its strings attached, soured whichever good intentions Humboldt and Schleiermacher had. The university systems in advanced-capitalist nations now look more like what Dobbins and Knill name "the *state-authority model*, [wherein] universities are state-operated institutions marked by strong process control and limited autonomy. The state coordinates many aspects including admissions, curricula, and appointment of personnel, and actively influences quality assurance and university-business relations."[65] The state dictates required courses, passing standards, faculty-hiring standards, and other contingencies in exchange for its funding.

For modern-day science departments, state requirements for funding include ostensible quality-control measures like soft quotas for peer-reviewed publishing. In exchange for funding, the state expects a certain amount of finished work to prove the productivity that justifies it. To prove the quality of the work, the state expects scientists to engage in the re-creation process that Schleiermacher described – reading and citing the work of others for their own original content. Lastly, the state expects original work to undergo a peer-reviewing process. Scientists' peers evaluate their work to determine whether they read sufficient amounts of other scientists' works and have sufficiently good methodologies before accepting the work into the realm of legitimate science – the academic journal. All of these steps, the state hopes, ensure that the work that it funded will be good enough to lead to the social, economic, or technological advances that

64 Michael Dobbins and Christoph Knill. "Higher Education Policies in Central and Eastern Europe: Convergence toward a Common Model?" in *Governance*. 22.3 (2009), 403.
65 Ibid.

justify its funding. For the sake of specificity, a geologist with whom I spoke estimated that some of his peers in his department spent up to half of their waking life, 50% of their time, writing grant proposals and applying for funding.[66]

Here, I focus on the second of Humboldt's three unities – that of "teaching and research." Research, on Humboldt's view, was to consist in scholars challenging one another, in a constructive way, to better research. Having in mind the competitive spirit of Nietzsche's good *Neid*, Humboldt imagined scholars in good faith building on one another's work. By contrast, Richard Smith has presented a number of "defects" in the peer-review and grant-awarding processes. The root of many of these problems is the erroneous lingering conception of scientists as purely rational, unbiased agents. As all-too-human humans, this is an impossibility. "[T]here is strong evidence of bias against women in the process of awarding grants . . . [and] evidence of bias against authors from less prestigious institutions," Smith notes.[67] While most would find this observation troublesome, a possible objection here is that by blinding these processes, we can eliminate implicit and explicit biases along perceived lines of sex or institutional prestige. Through blinding, we could eliminate an existing problem without throwing out the baby with the bathwater; we could keep the Humboldtian unity of research and teaching intact rather than advocate for far-reaching alternatives.

Unfortunately, this is not the only sort of problem that Smith identifies. He continues that "Robbie Fox, the great 20th century editor of the *Lancet*, who was no admirer of peer review, [and] wondered whether anybody would notice if he were to swap the piles marked `publish' and `reject' " before admitting to having himself been "challenged by two of the cleverest researchers in Britain to publish an issue of the journal comprised only of papers that had failed peer review

[66] Dr. James Kubicki, in discussion with the author, May 2018.
[67] Richard Smith, "Peer Review: A Flawed Process at the Heart of Science and Journals," in Journal of the Royal Society of Medicine, 99.4 (2006), 180.

and see if anybody noticed. [He] wrote back `How do you know I haven't already done it?' "[68] Similarly, Fox disclosed that the Lancet's decision-making process regarding publication and rejection consisted of throwing submissions for that issues down a flight of stairs and publishing those submissions that made it to the bottom of the staircase.[69] As state funding is contingent on peer-reviewed publication, the extent to which the peer-review process is arbitrary is the extent to which state funding is arbitrary.

"You can steal ideas and present them as your own, or produce an unjustly harsh review to block or at least slow down the publication of the ideas of a competitor. These have all happened," Smith notes.[70] Famously, Darwin rushed to publish the ideas of *On the Origin of Species* . . . to beat Alfred Russel Wallace to establishing scientific priority. The race to be the first to a theory or discovery is perfectly compatible with a healthy scientific contest. The paces at which one researches, writes, and fleshes out ideas should be the metric by which the scientific contest determines winners and losers. This was, by and large, the metric of the so-called "gentleman science." By contrast, one can imagine either Darwin or Wallace, having formulated extremely similar theories of evolution, exercising direct decision over whether the work of the other finds publication or not. Rather than a publisher acting as a referee of the scientific contest, the current peer-review process is analogous to one's competitors acting as referees; that their competitors can "unjustly" review their peers or outright steal their ideas is analogous to cheating at the contest.

Complicating the difficulty of "fair" peer review is the truth that the decision to publish or not tends to hinge not on the interests of one peer but of several. Part of what follows from a collection of peers reviewing work is that the odds of a submitter having parallel ideas or

[68] Ibid., 178.
[69] Ibid.
[70] Ibid., 180.

findings to a reviewing peer go up; the more peers reviewing, the higher the potential for abuse – the "steal[ing of] ideas" and "unjustly harsh reviews" that Smith notes. An additional problem with this science for an audience arises even when the reviewing peers are all receptive in good faith. An article has to appeal to the implicit biases of most of them to earn their recommendation to publish. Given the diverging interests among scientists, a panel of them implicitly encourages lowest-common-denominator work. As the number of reviewers increases, the likelihood of striking a reviewer as sufficiently misguided, revolutionary, or unscientific increases. In addition to the politicking that attempting to avoid competition implies, the peer-review process implicitly encourages safe, unremarkable research building slowly and boringly from the existing literature. These are the safest ways to avoid the boat-rocking that blocks publication and hinders careers.

More powerfully, a failure to find sympathetic-enough peers to publish one's work can result in ending professional careers entirely. A bacteriologist with whom I spoke told me that if she expressed to her scientific colleagues that she did not subscribe to the basic tenets of Darwinism, then they would ostracize her from professional biology.[71] This claim is itself testable, and such an ostracizing has happened before. Rupert Sheldrake, a biologist by training, has similarly argued that "[i]n the second half of the twentieth century, neo-Darwinians insisted that all creativity was in the final analysis a matter of random mutations and the blind forces of natural selection: an interplay of chance and necessity."[72] This is after he found himself ostracized from serious, professional science: "exactly like a papal excommunication. . . . I became a very dangerous person to know for scientists," he recalls.[73] His ostracization resulted from his challenging, publicly, certain widespread presuppositions among natural scientists, e.g.,

[71] Dr. Sarah Martínez, in conversation with the author, April 2016.
[72] Rupert Sheldrake, *The Science Delusion: Feeling the Spirit of Enquiry* (Coronet, 2012), 92.
[73] Tim Adams, "Interview: Rupert Sheldrake: The 'Heretic' at Odds with Scientific Dogma," in *The Guardian* (2012), accessed 5/15/2019, https://www.theguardian.com/science/2012/feb/05/rupert-sheldrake-interview-science-delusion

physicalism, the regularity of natural laws. If science is merely experimentation, though, then questioning these basic working presuppositions is itself scientific. Nietzsche's " 'gay science' of fearless experiment and the good will to accept new evidence and to abandon previous positions, if necessary" runs deeper than relatively specific working models of observed phenomena.[74] Sheldrake is reintroducing the philosophical into biology with his deep questioning of his colleagues' basic assumptions. Ostracizing him as a result would make mainstream scientific practitioners cease to be scientific and rather become dogmatic.

II. Nietzschean Value Theory and Education: A Critique

A rejection of objectivity, in the weak and strong senses, coupled with an account of Nietzsche's perspectivism, clears the way for new values in the sciences. That is, objectivity has, and continues, for some, to serve as the metric by which we evaluate the sciences as well as scientists. While Nietzsche's perspectivism – his account of the world exclusively as a series of experiences – offers a plausible alternative to the conventional picture of our interactions with the world, we would need something else to evaluate the differing perspectives, rooted in their different eco-physiologies. Here, I offer a brief account of a recurring value theory of Nietzsche's – rarity – with an eye toward better understanding Humboldt's educational reforms and, ultimately, offering a better alternative value for scientists: style.

Throughout the second half of Nietzsche's corpus (the 1880s), he argues for the importance of rarity in assessing the value of someone or something. He is most explicit in "On the Gift-Giving Virtue" in *Thus Spoke Zarathustra*: "Tell me: how did gold attain the highest value? Because it is uncommon and useless and gleaming and gentle in its splendor."[75] More troublingly, he chastises Germany in *Beyond Good and Evil* More for having invented the

[74] Kaufmann, *Nietzsche: Philosopher, Psychologist, Antichrist*, 86.
[75] Nietzsche, *Zarathustra*, 186.

printing press; seemingly, he sees the value of the written word, and subsequently, of reading, as going down with too great an increase of supply.[76] More troublingly still, in his last productive year, Nietzsche contrasts positively The Law of Manu with Christian morality. On his reading,[77] The Law of Manu protects the value of humanity by limiting its supply – by stripping humanity from an entire group of people, namely the chandalas. Through "murderous epidemics, ghastly venereal disease, and thereupon again 'the law of the knife,' ordaining circumcision for male children and the removal of the internal labia for female children," Nietzsche sees more value in The Law of Manu than in Christianity because it results in "pure blood"; on his account, the nobility of the uncommon noble classes of humanity requires the inhumane treatment of the many commoners.[78]

His point becomes clearer in *On the Genealogy of Morals,* wherein he traces the shared genealogy of the German "bad" (*schlecht*) with the German word for the plain (*schlicht*) – not originally with any derogatory connotation but merely "in contrast to the nobility."[79] Nietzsche is reminding of the subtle derogatory connotation that evolved from this contrast to noble evaluation – the sense in which we use "common" akin to how we use "garden-variety" or "pedestrian." On a quick analysis, there is a mutual exclusivity between the common and the exceptional. By definition, what is exceptional cannot be common; it is exceptional (it is an exception) compared to what is common. Clearer still, the excellent, likewise, can only be excellent – can only excel – compared to that which does not, namely the common, the garden-variety, the average. To be exceptional, and especially to be excellent, something must be rare

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[76] Nietzsche, *Beyond Good and Evil*, 3.
[77] Nietzsche's reading is based on a secondary French account, *Les Législateurs Religieux: Manou, Moïse, Mahomet*, by Louis Jacolliot. Jacolliot's account is infamously bad. Annemarie Etter, "Nietzsche und Das Gesetzbuch Des Manu," in *Nietzsche-Studien,* 16 (1987), 340-352.
[78] Nietzsche, *Twilight*, 503-5.
[79] Nietzsche, *Genealogy*, 28.

compared to what is unexceptional or plain. Most relevant to my own purpose here, Nietzsche explicitly applies this value theory of his to formal education, as well. "What the 'higher schools' in Germany really achieve is a brutal training, designed to prepare huge numbers of young [people], with as little loss of time as possible, to become usable, abusable, in government service. 'Higher education' and huge numbers – that is a contradiction to start with. . . . All great, all beautiful things can never be common property," he argues.[80] Here, Nietzsche introduces a problem that I elaborate in Chapter 3: the relegation of scientists to de facto government service by way of the inescapable need for government funding. Moreover, he offers here the same argument generally for the necessity of rarity in determining value with regard to formal education, specifically. That universities are set up to train "huge numbers" of people entails that the quality of each individual person's education suffers as a result. The democratization of *Bildung* – making it available to all – entails the lowering of its quality for each individual person.

Here, I would like to break with Nietzsche's value theory of rarity on some level. I think that I can grant his basic premise – that the excellent only excels by contrast to that which does not, and that, conceptually, not everything can excel – as a general truism. I think that I can also make the stronger claim, though, that his conclusions do not follow from this general truism. Specifically, an account of commonality and rarity hinges on scope. The truth of Nietzsche's characterization of gold as rare hinges on his perspective as a nineteenth-century European. Only centuries after European contact with the Americas and increasing contact with Asia and Africa allows for the awareness of the diffusion of the precious metal. Gold was not and continues not to be evenly distributed beneath the earth, nor has it been evenly distributed once excavated and refined. More precisely, Europe accounts for roughly 2% of gold deposits on Earth while South

[80] Nietzsche, *Twilight*, 510.

America – a continent with less total area – accounts for more than eight times as much gold.[81] There are times and places in the world in which gold was not rare, and there were other times and places in the world in which gold was unknown entirely. Conceiving of gold as rare requires either the scope of a limited spatial contingency in which it is rare (Europe) or, in Nietzsche's case (owing to his own privileged education), an awareness of a global scope of gold production.

We know that Nietzsche is willing and able to think on a cosmic scope. He begins "On Truth and Lies in a Nonmoral Sense" in a fairytale way, foreshadowing the value of healthy mythologizing for which he goes on to argue: "Once upon a time, in some out of the way corner of the universe which is dispersed into numberless twinkling solar systems, there was a star upon which clever beasts invented knowing. That was the most arrogant and mendacious minute of 'world history,' but nevertheless, it was only a minute."[82] Aware of the long, complex history of epistemological change, Nietzsche could not mean something literal when he calls "knowing" an "arrogant and mendacious minute"; rather, the history of human epistemologies has been like a minute on this cosmic scale. Likewise, acknowledging that the universe is "dispersed into *numberless* twinkling solar systems" (emphasis mine) betrays an awareness of quite a grand scope. In his later writings, he still characterizes "the world" as "a monster of energy, without beginning, without end; a firm, iron magnitude of force that does not grow bigger or smaller . . . out of the . . . coldest forms [moves] toward the hottest."[83] Though less explicit, Nietzsche continues to evoke the cold dust of space congealing into solar furnaces as well as the electromagnetism that exist on a cosmic scope. The limits of our world come nowhere close to the limits of "the world," in scare quotes in the early and late Nietzsche to acknowledge this

[81] Natural Resource Holdings, "Global 2013 Gold Mine and Deposit Rankings: A Meticulous Examination of Existing and Future Gold Supply," 2013.
[82] Nietzsche, "Truth and Lies," 451.
[83] Nietzsche, *The Will to Power*, 550.

particular way philosophers refer to the entire cosmos, to reality.

The upshot, then, is that the rarity of something – and consequently, its value, even if we concede that Nietzsche is right about something's rarity working to determine its value – continues to hinge on the scope at which one contextualizes that something. Coupled with the cosmic scope at which Nietzsche thinks throughout his corpus, we can conceive of people, and indeed all of sentient life, in terms of this cosmic scope. In the same way that we are merely "clever beasts . . . in some out of the way corner of the universe," – while we are, in a certain light, insignificant on a cosmic scope – we would have to grant that we are exceedingly precious in precisely the same way. If we are misguided about the universality of "knowing," then we have to grant the rarity of "knowing" for the same reason that we have to reject its universality: it is specific to us, who exist in very particular (and rare) circumstances. More importantly, the alchemists could have their dream of synthesizing gold, printed texts could become ubiquitous, and all of humanity (including the chandalas of Nietzsche's account) could enjoy dignity and flourishing without cheapening the value of any of these rare things, for they would still be rare on a cosmic scope. In short, Nietzsche is uncharacteristically short-sighted and small picture in his general account of value as rarity.

The "democratization" of education as such, then – increasing its availability to huge numbers – does not necessarily sully its value; however, Nietzsche does seem to be touching on an unfortunate problem that education faces through increased quantity that gold, printed texts, and humanity do not face. Education is dynamic in a way that those are rare goods are not. Namely, it involves a reciprocity between educator and educated the likes of which do not exist for gold, printed texts, and humanity. Seemingly everyone laments the growing student-to-teacher ratio, even if we know of no better alternative. Given that people are finite, there must be

a definite ratio of students to teachers. Given the presupposition that teachers know something that students do not, on which education itself rests, educating is a slow process. If we want to keep widespread availability to education, yet reduce the student-to-teacher ratio, then we would have to create more teachers; however, to create more teachers – those "knowledgeable" enough to teach – then we would have to educate more people to the aim of increasing teachers (thus teaching). This, though, would itself require a reduced student-to-teacher ratio if it were not to produce teachers of a lower quality. The tension that exists between the two values of higher-quality education via reduced student-to-teacher ratio and of universal education is a serious one, including for scientists. I turn now toward an attempt at a solution to that problem.

III. Schopenhauer as Educator: Good Style and Teaching as Dancing

"Schopenhauer as Educator" remains Nietzsche's lengthiest account of the educating process, and it is a positive one, informed by the early Nietzsche's biggest philosophical influence. Echoing his sentiments about the value of rarity, he begins by stressing the eco-physiological uniqueness of the individual as such. "Artists alone . . . dare to show us man as he is, uniquely himself to every last movement of his muscles, more, that in being thus strictly consistent in uniqueness he is beautiful," Nietzsche argues.[84] That artists alone are capable of demonstrating this uniqueness hinges on Nietzsche's Mach-like perspectivism. Those "muscles" and other physical contingencies work to inform our perceptions of others uniquely, and in so doing, artists' crystallized expressions of experiences (their artworks) simultaneously manifest the uniqueness of their subjects and the uniqueness of the artists. No two artists will cast the same subject in exactly the same light, which demonstrates the unique complexity of the subject as well as the different artists.

[84] Friedrich Nietzsche, "Schopenhauer as Educator," in *Untimely Meditations*, trans. R.J. Hollingdale, ed. Daniel Breazeale, (Cambridge: Cambridge, 2016), 127.

For Nietzsche, then, a good educator is a good artist who helps a student to mold her/himself. "How can man know himself?" Nietzsche asks, before continuing, "He is a thing dark and veiled; and if the hare has seven skins, man can slough off seventy times seven and still not be able to say: 'this is really you, this is no longer outer shell.' "[85] The other side of our uniqueness coin, joining the flattery of our many possible lights and angles, is the profound difficulty of picking one of them. The limitless possibilities of the task are potentially as daunting as they are liberating. As with Nietzsche's perspectivist "epistemology" and, as I elaborate in Chapter 3, his accounts of good artistic creation and good scientific practice, good educating requires skillfully deciding what to emphasize and what to de-emphasize among the infinite richness of one's medium.

Arthur Schopenhauer was the first, Nietzsche claims, to have inspired in him this sort of self-creative task – its necessity and potential value. "What would be the principles by which [a true philosopher] would educate you? . . . One of them demands that the educator should quickly recognize the real strength of his pupil and then direct all his efforts and energy and heat at them so as to help that one virtue to attain true maturity and fruitfulness. The other maxim, on the contrary, should draw forth and nourish all the forces which exist in his pupil and bring them to a harmonious relationship with one another."[86] This seems a tall order for an educator given that, as Nietzsche argued earlier, higher education trains increasingly large numbers of students. Demonstrating to a student who s/he is and inspiring her/him to recreate artistically her/himself is a great enough task; being able to do it for hundreds of students at a time is surely impossible. Nietzsche lists three specifics of a good educator's task – how more precisely s/he would encourage a student to arrange her/himself: "seeing" (i.e., instilling a sophisticated disposition),

[85] Ibid., 129.
[86] Nietzsche, "Schopenhauer as Educator," 130.

thinking, and reading/writing. Importantly, he characterizes doing all of these things well as kinds of dance.[87] As anyone who has ever danced knows, it is better one-on-one than in a group.

A solution might lie in what Nietzsche calls "the supreme principle of all education, that one should offer food only to him *who hungers for it!*"[88] Rather than merely provide access to higher education, the norm, for often nefarious reasons, has become to encourage students to attend universities regardless. Lenders stand to gain a lot of money due to high tuition fees and supply costs, universities stand to gain a lot of money from the state through enrollment rates, and the state stands to gain a better-skilled workforce that is too indebted to cause waves. Perhaps the more-important response for Nietzsche, though, is "Hungry for what?" Part of what the increased specialization of departmentalized education has meant, as I elaborate in Chapter 3, is a series of individuals who are simultaneously hypertrophied and atrophied rather than well-rounded and versatile.

On one geologist's account, the days when scientists could have interdisciplinary conversations with, say, philosophers are long gone; instead, scientists are kept so busy that they are forced even to eat as they work.[89] A philosopher attests that scientists do not have little free time; they have no free time.[90] Part of what Nietzsche's neo-classicist aesthetic value of harmonious arrangement entails, in addition to a well-arranged mind, is a well-arranged set of activities. Nietzsche's favorite people – Goethe, Raphael, Ralph Waldo Emerson, Roger Boscovich – wore many hats. They were polymaths who do not "lack everything, except one thing of which they have too much," as Nietzsche criticizes specialists.[91] Indeed, many great

[87] Nietzsche, *Twilight of the Idols*, 511-3.
[88] Friedrich Nietzsche, *Daybreak: Thoughts on the Prejudices of Morality*, trans. R.J. Hollingdale, eds. Maudemarie Clarke and Brian Leiter (New York: Cambridge, 2011), 115.
[89] Dr. James Kubicki, in discussion with the author, May 2018
[90] Dr. Deepanwita Dasgupta, in discussion with the author, May 2019.
[91] Nietzsche, *Zarathustra*, 250.

scientists (and philosophers) had other trainings. What is superior to interdisciplinarity is, as Ron Giere calls it, "multidisciplinarity." If a good, fertile perspective entails utilizing all of its faculties, and knowing when, then good science and good philosophy entail utilizing many different skillsets, and knowing when.

IV. Nietzschean Style: Ethical Imperative and Alternative Scientific Value

We see, then, in Nietzsche's account of a good educator and a good education, a parallel to a piece of the puzzle of Nietzsche's aesthetic imperative: style. While the secondary literature has tended to focus on Nietzsche's own writing and philosophical styles rather than his philosophical account of style, he has important things to say about style and the roles that it plays in aesthetics and life generally – especially a good life. He gives his clearest account of style in *The Gay Science* 290: "*One thing is needful*," he emphasizes, which is "to 'give style' to one's character – a great and rare art!"[92] Here, one sees another example of rarity in Nietzsche (the ability to give style to one's character), which, as I have shown, goes a long way to establishing its value for Nietzsche. Moreover, the necessity that he italicizes makes clear that style, for Nietzsche, is more than the "readily dispensable tinkling of bells that accompanies the 'seriousness of life.' "[93]

Nietzsche seeks in this section to establish the importance of style, but that begs the question of how exactly one "give[s] style" to one's character. He continues that giving one's character style "is practiced by those who survey all the strengths and weaknesses of their nature and fit them into an artistic plan until every one of them appears as art and reason and even weaknesses delight the eye. Here a large mass of second nature has been added; there a piece of original nature has been removed – both times through long practice and daily work at it. Here

[92] Nietzsche, *The Gay Science*, 232.
[93] Nietzsche, *The Birth of Tragedy*, 31.

the ugly that could not be removed is concealed; there it has been reinterpreted and made sublime."[94] In this brief passage, Nietzsche articulates the two biggest values of classicist aesthetics: restrained discipline and a harmonious arrangement of constituent elements. Contrary to then-dominant romantic aesthetics, which favors histrionic shows of emotion and fetishizing the perceived flaws in others, the later Nietzsche finds inspiration in the antiquarian alternative that the *Weimarer Klassik* circle – especially its center, Johann Wolfgang von Goethe – developed. How Goethe, in his life and his work, embody aesthetic excellence for Nietzsche, and how that can inform the sciences, is the focus of Chapter 3. In brief, though, the virtue that Nietzsche sees in Goethe, as living classical excellence, is how effortless he has made his achievements seem despite the great efforts that he put into them.

When Nietzsche argues that the task of his dream educator would "be to mould the whole man into a living solar and planetary system and to understand its higher laws of motion,"[95] he is painting a particular portrait of what Schopenhauer's philosophy did to him. This metaphor illustrates well the contrariness that Nietzsche identifies between his two principles of a good educator: that s/he emphasize the perceived essence ("real strength") of the student as well as cultivating the whole of the student's personality into a "harmonious relationship." Lest a student become a lopsided person, figuratively, with too much of one thing and not enough of anything else, a good educator helps the student to arrange properly the constitutive elements without rendering the unity a shambles. To this end, a solar system has its "one virtue" in its sun, but it has other "forces" in its orbiting planets which, nonetheless, understand that the sun is the real strength around which they are to orbit.

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[94] Nietzsche, *The Gay Science*, 232.
[95] Nietzsche, "Schopenhauer as Educator," 131.

As I have shown, the aesthetic attitude to the world represents, for Nietzsche, a better, has other "forces" in its orbiting planets which, nonetheless, understand that the sun is the real strength around which they are to orbit healthier alternative to the world than the one that scientists tend to have in the wake of Socrates. In particular though, aesthetic excellence, including excellence in style, is for Nietzsche akin to an ethical imperative. As James Sloan Allen puts it, "Arising from imaginative *individuality*, depending on clear-eyed *honesty*, animated by Dionysian *energies*, and imposed by the artistic discipline of Apollonian *form*, [Nietzsche's] ethics of style is an art of life – not *lifestyle*, that ubiquitous catchword for our consumer culture – as both an aesthetic ethics and an ethical aesthetics. That is, an aesthetics with ethical consequences, and an ethics with aesthetic form."[96] We usually think of aesthetics and ethics as different flavors of axiology – evaluating good and bad, and arguing how to do so. Specifically, we think of moral evaluations as extending beyond aesthetic ones and, as a consequence, having more import. That is, it would be strange, on conventional readings, to stop at evaluating certain actions in merely aesthetic terms. Nietzsche does grant that moral evaluation extends beyond aesthetic evaluation; however, he rejects the claim that we should, for he rejects the notion that morality is more powerful than aesthetics.

His clearest case to this effect is his good/bad, good/evil distinction in *On the Genealogy of Morals*. "[I]f the lambs say among themselves: 'these birds of prey are evil; and whoever is least like a bird of prey, but rather its opposite, a lamb – would he not be good?' There is no reason to find fault with this intuition as an ideal, except perhaps that the birds of prey might view it a little ironically and say: '*we* don't dislike them at all, these good little lambs; we even

[96] James Sloan Allen, "Nietzsche and Wilde: An Ethics of Style," in The Sewanee Review, Vol. 114, No. 3 (Summer, 2006), 396.

love them: nothing is more tasty than a tender lamb."[97] Nietzsche's point here is to illustrate something strange about the concept of evil. Aesthetic and ethical language overlaps everywhere else. We can move between the "good" and the "bad," and even the "right" and the "wrong" of both aesthetics and ethics. With a bit more difficulty, we can see the overlap of aesthetic and ethical "fairness" (its ethical appeal and the comeliness of a fair face) as well as the overlap of aesthetic and ethical "ugliness" (from the old Norse *uggligr*: dreadfulness, i.e., something so unattractive that it inspires disgust, repulsion, and avoidance. We still sometimes talk of people being or behaving "ugly" to one another). Where the overlap in the evaluative language breaks down, it seems, is with "evil." If an eagle enjoys nothing more than a tasty lamb, Nietzsche wants us to conclude that it finds even the worst lambs short of evil – merely stringy, gamey, or otherwise unsatisfactory (bad) gustatorily.[98]

The concept of evil, Nietzsche argues, stems from resentment: a curdling of negative appraisal that stems from viciousness. By contrast, one can easily imagine the power to forget – the power to overcome the temptation to resentment and revenge – is a virtue. The more that one can forget and overcome, the stronger, healthier, more enduring, and more virtuous one is. Nietzsche goes further: the more that one can forget and overcome, the more stylish one is; far from a trifling concern ("readily dispensable tinkling of bells"), style is itself a serious concern for life – important if not solemn. He continues in *The Gay Science* 290: "[O]ne thing is needful: that a human being should attain satisfaction with himself, whether it be by means of this or that poetry or art; only then is a human being at all tolerable to behold. Whoever is dissatisfied with

[97] Nietzsche, *Genealogy*, 44-5.

[98] To be clear, I reject the heart of Nietzsche's argument here. His analogy of birds of prey and lambs with noble and "slavish" values breaks down precisely where he needs it: with regard to the cleverness and naïveté which he argues we should conceive of as forming a spectrum with degrees rather than as opposites. Surely an eagle is cleverer than a lamb, and surely then lambs, eagles, clever slaves, and naïve nobles exist on a spectrum of cleverness and naïveté, and of accountability accordingly; however, we can separate this part of his argument from a more general claim: that there may be a virtue in the power to overcome the drive to resentment.

himself is continually ready for revenge, and we others will be his victims, if only by having to endure his ugly sight. For the sight of what is ugly makes one bad and gloomy."[99] An often forgotten facet of ugliness – and a value of Nietzsche's philological training – is its move beyond mere negative aesthetic appraisal to inspiring dread. Importantly, as I stress at the end of Chapter 3, the ugly should encourage avoidance. Nietzsche's project to "translate man back into nature" entails treating "*Die Pflanze Mensch*" – the plant [that is] humanity.

The root of all of our unavoidable, human, all-too-human physiological truths is that, like plants, we are subject to the same patterns of inputs and outputs of which we find ourselves apart. "[A]esthetics is nothing but a kind of applied physiology,"[100] Nietzsche argues, and "[t]hat which is instinctively repugnant to us, aesthetically, is proved by mankind's longest experience to be harmful, dangerous, worthy of suspicion: the suddenly vocal aesthetic instinct (e.g., in disgust) contains a *judgment.* To this extent the beautiful stands within the general category of the biological values of what is useful, beneficent, life-enhancing – but in such a way that a host of stimuli [are] only distantly associated with."[101] On Nietzsche's account, we have pre-rational aesthetic evaluations of the physical world that track, what our human histories inform us, to be good or bad to our health – beautiful or ugly, respectively. This way of evaluating immediately provides a way of shortcircuiting the need for the slower, ad hoc rationalizing process, for which we may not have time given (the danger of) the circumstances.

Crucially, then, continued exposure, rather than avoidance, to what we find ugly has the tendency to render ugly that person of bad taste, too. General instincts we have about the character (*ethos*) of one based on what one consumes are not anti-rational, for Nietzsche, but pre-

[99] Nietzsche, *The Gay Science*, 233.
[100] Friedrich Nietzsche, *Nietzsche Contra Wagner: From the Files of a Psychologist*, in *The Portable Nietzsche*, trans. Walter Kaufmann, (New York: Viking, 1969), 664.
[101] Nietzsche, *The Will to Power*, 423.

rational. Those instincts tend to be right and good, so ad hoc rationalizations that support them are late arrivals, redundancies, and shadows of those faster instincts. Those rationalizations that disagree with those instincts are worse: potentially dangerous, potentially ugly themselves. In the most-extreme cases, we do unapologetically pathologize tastes for the ugly, the harmful: trichophagia, dermatophagia, geophagia.[102] Bad taste is rooted in dissatisfaction with oneself. One should care enough about oneself to avoid eating hair, skin, or soil, but one does not; less-extreme examples of bad taste are different in degree, for Nietzsche, but not in kind. Nietzsche's point is that a bad taste – a bad receiving aesthetics – does not only negatively affect the taster, but it informs the style – the giving aesthetics – as well. One does not find dreadful what one should, and as a result, one becomes uglier, more dreadful, oneself. Then, by extension, one has the potential to spread this aesthetic malady to others. For this reason, one has an imperative to good style, and by extension good taste, lest one becomes "[in]tolerable to behold." For this reason, Nietzsche prescribes quarantining the healthy from the sick lest the ugliness that tracks bad health spreads further.[103]

[102] Habits of eating hair, skin, and soil, respectively.
[103] Nietzsche, *Genealogy*, 124.

CHAPTER 3: AN AESTHETIC SOLUTION: GOETHE AND THE PROMISE OF A TASTEFUL SCIENCE

So far, I have made the case that, until the late-nineteenth century, the natural sciences were engaged in state of good *Neid*, of which Nietzsche approved. Then, I traced the rise of Humboldtian academics – universalization, departmentalization, and peer-review – and the negative consequence that these educational reforms have had on the style of scientists. Now, I make a case for the aestheticization of the natural sciences. I start by making a case for the widespread tastelessness of contemporary science. I then turn to what I have tried to make a fair response on the part of contemporary scientists and philosophers of science; however, I still conclude that their overriding values – explanatory power (often the weak sense of objectivity, intersubjectivity) and utilitarian results – are inadequate. I establish the normative import of offering an alternative value by making a case for the unsustainability of the current project of big technoscience, i.e., how it fails by its own lights. Lastly, I elaborate the tasteful scientific practice of Nietzsche's exemplary scientist, Johann Goethe, with emphasis on Nietzsche's account of taste, in the hope of showing its attractiveness compared to the natural sciences of today.

I. The Tastelessness of 21st-Century Science

I offer two very-recent examples of the tastelessness of the natural sciences. The first of these is the first photograph of light behaving both as a series of particles and as a wave, from March, 2015.[104] The second of these is the first photograph of an atom – a Strontium atom –

[104] "The first ever photograph of light as both a particle and wave," *Phys*, Last modified March 2, 2015, https://phys.org/news/2015-03-particle.html

which Oxford researchers had suspended in electric fields from February, 2018.[105] In the first case, researchers photographed the view from an electron microscope of trapped photons reacting to electrons. In the second case, researchers challenged forth an extra-sensible part of the world, discovered with a powerful, colored laser. In both cases, researchers have betrayed deep dissatisfactions with the stuff of appearances. If one were to ask why these researchers were dissatisfied with the ambiguity of light's sometimes-wave-like and sometimes-particle-like nature or the imperceptibility of atoms, respectively, then a possible response, and one indicative of the natural sciences, might be, "They want to see into the mind of God."[106] Nietzsche famously diagnosed one problem with this kind of project.[107]

Moreover, these transgressions cut to the heart of 21st-century science's ostensible value neutrality (re: nihilism). Even a good chemist, aesthetically sensitive and otherwise impossible to dislike, has articulated the scientific project as "try[ing] to ask questions that lead to other questions."[108] Since it is impossible to maximize two values at the same time, the maximization of the number of questions necessarily entails the sacrifice of the quality of questions. Without any caveat, scientists chasing questions do not have very much regard for where their chases take them as long as the funding permits. In the past year, I spoke with a biologist whose recent book offers language typical of 21st-century science. The book contains disappointingly few instances of "ethics," "responsibility," "owe," or "obligation." More relevantly, its one mention of "taste" concerns the poor one of cassava; its two mentions of "style" refer to cuisine origins; its handful of references to "beauty" are of the passive and uncritical sort for which Nietzsche mocks Kant

[105] Scott D'Arcy, "Picture of single atom suspended in electric fields wins top science photography prize," *Independent*, Last modified February 12, 2018, https://www.independent.co.uk/news/science/atom-photograph-top-prize-strontium-david-nadlinger-oxford-university-engineering-physical-sciences-a8206196.html
[106] Dr. Deepanwita Dasgupta in discussion with the author, July 2018.
[107] "God is dead. God remains dead. And we have killed him," Nietzsche, *The Gay Science*, 181.
[108] Dr. Skye Fortier, in discussion with the author, October 2017.

and Schopenhauer It contains more instances of "unlock," "uncover," "discover," and "penetrate."[109] Seemingly, this self-described lock-picking gives no regard to who or what locked away those secrets (phylogenetic information, namely), it gives no regard to what it may owe the force(s) that did the safeguarding, and it gives no regard to whether those secrets are locked in a deceptive Pandora's box.

In short, a scientist with this lock-picking attitude gives no regard to whether he should unlock a given secret. Seeking to, especially without critical self-reflexivity, is voyeuristic and violating. It violates Nietzsche's "dictate of good taste, gentlemen, the taste of reverence for everything that lies beyond your horizon."[110] If I am correct in this, then seeking to unlock the secrets of God's mind would be ransacking and desecration. Part of what practicing science in good taste must entail is practicing science with a taste at all – to have discrimination for the questions we choose rather than being "youths who endanger temples by night, embrace statues, and want by all means to unveil, uncover, and put into a bright light whatever is kept concealed for good reasons."[111] Nihilistic 21st-century science displays an eagerness to pick and taste almost anything; thus, it betrays little choosiness, little taste at all – a tastelessness. By contrast, one question is as ten thousand to me, if it be the best. As a glimmer of hope, though, Nietzsche followed his diagnosis with a less-famous prescription: "Must we ourselves not become gods simply to appear worthy of [having killed God]?"[112] I turn now to this monumental problem, i.e., how we can grow to construct the world artfully and live forever.

II. What Can Scientists and Philosophers of Science Offer?

I would like now to consider some scientific perspective given the critical nature of the

[109] Eli Greenbaum, *Emerald Labyrinth: A Scientist's Adventures in the Jungles of the Congo* (Lebanon: ForeEdge, 2018).
[110] Nietzsche, *The Gay Science*, 335.
[111] Ibid., 38.
[112] Ibid., 181.

preceding. Specifically, my limited experience tells me that chemists, more than other natural scientists, may have some taste, i.e., some aesthetic sensitivity. We owe this sensitivity, I think, to the often-ambiguous nature of the field. The work of chemists, even under the command of big technoscience, is still intermediary: they turn something into something else (more profitable). At any rate, this aesthetic sensitivity holds true at a personal level, at which an immensely likable chemist characterized his occupation as "mak[ing] beautiful molecules."[113] This portrait of the chemist as micro-sculptor has promise. The greater promise of aesthetic sensitivity among chemists holds true at an impersonal level, as well. Roald Hoffmann, a Nobel-Prize-winning chemist turned poet and playwright, has taken more recently to writing popular philosophy of science.

To begin, Hoffmann enumerates some of what he considers technoscience's best contributions to human life in terms of a muddled list of "necessities and comforts": longer lifespans, birth control, a greater color palette, freedom from the smell of sewage, cures for diseases, electric lighting, food, improved air quality, film, and music.[114] The problem is that "necessities" have a funny way of multiplying when we feed them. The life of our necessities, when stimulated, encroaches on the life of our comforts, the former assimilating the latter *ad nauseum*. Without checking our drives for comforts, what was once a pleasant presence – "the Ramayana on the screen or a Mozart rondo in the air"[115] – becomes an unpleasant absence. Comforts become necessities. We grow to demand what was formerly rare and un-promised; we grow more dependent (thus weaker). That Hoffmann does not distinguish between or organize the two may betray his guilt on this point; where the one category ends and the other begins may be unclear to him. Further, this scientific fruit – feeding "necessities" – is the one that Hoffmann

[113] Dr. Skye Fortier, in discussion with the author, October 2017.
[114] Hoffmann, Roald, *The Same and Not The Same* (New York: Columbia, 1995), 211-2.
[115] Ibid., 212.

contrasts with "subjugation, propaganda, and even torture."[116] Even on Hoffmann's sympathetic insider's account, then, taming what could have been a series of stronger, healthier, and more-independent animals is the best that the natural sciences currently have to offer.[117] In either case, the fruits of the natural sciences are inseparable from values: a fruit is only good or bad with regard to one taste or other.

Elsewhere,[118] Hoffmann is good to offer four alternatives to explanatory power as metrics for evaluating scientific theory: simplicity, storytelling, a roll-on suitcase, and productivity. The first of these proves promising but unsatisfying. Namely, Hoffmann argues for simplicity's value along aesthetic lines: a simple equation "is beautifully simple, and simply beautiful."[119] He fails to move away from explanatory power here, though, given that the alleged beauty of a theory is equivalent to its simplicity, for the simplicity of a theory only speaks to the efficiency of its explanatory power. That is, between two theories explaining roughly the same amount of phenomena, the one that does so over the course of fewer symbols is simpler (and consequently more beautiful). As an alternative to explanatory power, it fares badly by virtue of existing only in relation to explanatory power. It fares badly, too, as an account of beauty, though to Hoffmann's credit, he admits as much, blaming the bad taste of his colleagues (which part from his own).

At a glance, storytelling, what we do "[w]hen things are complex yet understandable,"[120] seems friendly to Nietzsche's perspectivism – the recognition of our eco-physiologically and spatio-temporally informed vantages amidst an infinite richness. Nietzsche does characterize our

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[116] Ibid.
[117] "Whoever knows what goes on in menageries doubts that the beasts are 'improved' there." Nietzsche, *Twilight*, 502.
[118] Roald Hoffmann, "Why Buy That Theory?," *American Scientist*, Vol. 91, No. 1 (2003), 9-11.
[119] Ibid., 9.
[120] Ibid., 9.

finite accounts of the infinite world as mythologizing[121]; however, on Hoffmann's account, stories "domesticate unexpectedness," "wrest pleasure, psychologically, from a messy world," and "captures the way the world works."[122] Nietzsche has choice[123] words[124] for each[125] of these tendencies, respectively, which I hope the rest of this work elaborates sufficiently. The most-important problem with Hoffmann's storytelling, or capturing how the world works, is that it, too, fails to escape being a nuance of explanatory power. By design, a fantastical myth, though it shares some important truth or other about the world, seeks to keep intact something enchanting about the world. Rather than seeking to tame the unexpected, good myths seek to preserve it – keep it wild. Scientific storytelling fails in its goal to become other than myth, yet it succeeds only in becoming a bad myth: a myth born of a bad conscience, aiming to disfigure its wild and enchanting nature and to hypertrophy its most banal feature (the explanation).

Portability, which is a measure of those theories "that can be applied by others to obtain surprising results" and entails "[r]elatively uncomplicated models that admit an analytic solution," being also "[i]n part . . . fashion," begins less promisingly.[126] I would argue with confidence that Nietzsche would appreciate donning and doffing conceptual spectacles – ways of seeing the world – as effortlessly as the genuine article (if done in good taste). At the same time, Hoffmann is still failing to go beyond explanatory power: relatively uncomplicated models" are still "admit[ting] an analytic solution," which is to say that "beautifully simple and simply

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[121] "[W]hen we project and mix this symbol world into things as if it existed 'in itself,' we act once more as we have always acted – mythologically," Nietzsche, *Beyond Good and Evil*, 29.
[122] Hoffmann, "Why Buy That Theory?," 10.
[123] "To call the taming of an animal [or the world's phenomena] its 'improvement' sounds almost like a joke to our ears," Nietzsche, *Twilight*, 502.
[124] "[T]he theoretical man enjoys and finds satisfaction in the discarded covering . . . with that one nude goddess [knowledge] . . . and finds the highest object of his pleasure in the process," Nietzsche, *The Birth of Tragedy*, 94.
[125] "[W]e produce these representations [of the world] in and from ourselves with the same necessity with which the spider spins. If we are forced to comprehend all things only under these forms, then it ceases to be amazing that in all things we actually comprehend nothing but these forms." Nietzsche, "Truth and Lies," 458.
[126] Hoffmann, "Why Buy That Theory?," 10.

beautiful" stories that we tell continue to describe as much of the world as possible as tersely as possible. This time around, Hoffmann has introduced an additional element – intersubjectivity – which also warrants critique. Intersubjectivity has its place. One struggling to orient oneself amid the infinite richness of phenomena may find a stable foothold from a broad consensus. It can offer quick answers to those with questions and confirmation for those who need it – those without enough of their own theoretical confidence – and it provides the sense of shared experience and meaning: in a word, warmth.

As with Hoffmann's best technoscientific fruits, though, the warmth of shared experience and meaning has the power to tame a lion. "Are we not, with this tremendous objective of obliterating all the sharp edges of life, well on the way to turning mankind into *sand*? Sand! Small, soft, round, unending sand!," Nietzsche laments.[127] His metaphor is two-fold. In the first place, as with a tamed lion, we become safer, "softer," more-comfortable as a result of the friction from rubbing up against so many others. In sanding the edges of the external world and of ourselves for safety and comfort – for warmth – we become increasingly unable to bear pointy or awkward facets of the world – in this case, those perspectives that diverge from the intersubjective consensus. The second weakness of intersubjectivity, then, aside from the problems of the sanded edges, is the resulting sand. Unchecked intersubjectivity always runs the risk of homogeneity, of the end of the existence and possibility of divergent perspectives. A sea of sand is a sea of unexceptional particulars, all rendered common by their uniform regularity.

A desert is also a barren environment. "Compared to a genius – that is, to one who either *begets* or *gives birth,* taking both terms in their most elevated sense – the scholar, the scientific average man, always rather resembles an old maid," Nietzsche argues.[128] Conceptual fertility,

[127] Nietzsche, *Daybreak,* 106.
[128] Nietzsche, *Beyond Good and Evil,* 125.

i.e., the capacity to produce new ideas, is a virtue. Here, Nietzsche has in mind those scientists we have come to think of as regular in the Kuhnian sense. Their work is diligent yet rote, plugging away on revising and refining existing problems and solutions, but it is never to produce any of their own. Thomas Kuhn's regular scientists are only regular by contrast to revolutionary scientists – the creative, iconoclastic ones. Nietzsche's disgust with intersubjectivity – a common framework of understanding – is that, if unchecked, it eliminates the possibility of the revolutionary scientists who would facilitate the growth of a new paradigm. Taken to an extreme, intersubjective agreement renders a culture stagnant. Hoffmann's value of portability ("A Roll-On Suitcase") is a ticket to Nietzsche's dreaded last man: the ebb of the great flood of human creation beyond itself.[129]

On this note, Hoffmann's last alternative to explanatory power (productivity) proves promising, even inspirational. "People need reasons for doing things. Theories provide them, surely to test the theories (with greater delight if proved wrong), but also just to have a reason for making the next molecule [or solution, or gadget, . . .] down the line," he argues.[130] An experiment can be a wonderful way to reject an existing theory, which is often necessary to clear the way for a better one. Along the same lines, an experiment can also be a wonderful way to solidify the formulation of a new one. In either case, theories and experiments are locked in the same agonistic reciprocity entailed by Nietzsche's "physiology with a clear conscience," or the paradox of human sense organs. The stuff of perception – the experiment – takes place (or does not) as a result of the perceiving – the phenomenal awareness. At the same time, that awareness – how we interpret the stuff of perception – is, as always, also informed by the stuff of perception (the experiment). In Hoffmann's productivity, we find excellent ground for the artful

[129] Nietzsche, *Zarathustra*, 124.
[130] Hoffmann, "Why Buy That Theory?," 10.

construction of the world that, through agonistic competition with competing theorists and experimenters, can result in scientists surviving themselves "down the line" through those they inspire. Crucially, though, Hoffmann's value cashes out in terms of the experiment.

Lastly, lest I be too hasty in allowing Hoffmann to speak, individually, on behalf of all scientists, I will note the similarity of his account with those of other scientists. Ian Hacking and Ronald Giere, both of whom, like Hoffmann, are scientists (physicists) turned philosophers of science, share a germ of the perspectival eye that Nietzsche had. Hacking, a proponent of experimentalism – the proposition that the essence of science is experimentation – has previously made "a plea for experiment," "[o]ne chief role of [which] is the creation of phenomena. Experimenters bring into being phenomena that do not naturally exist in a pure state."[131] Like Hoffmann, Hacking stresses the value of experiment to the end of "doing something," while also noting the perspectival differences between experimenters. "Although various properties are confidently ascribed to electrons, most of these properties can be embedded in plenty of different inconsistent theories about which the experimenter is agnostic. Even people working on adjacent parts of the same large experiment will use different and mutually incompatible accounts of what an electron is," he continues.[132] Similarly, Giere, like Nietzsche, whom he repeatedly cites,[133][134] characterizes scientific investigation as "perspectival."[135] Like Hacking, who argues, "The 'direct' proof of electrons and the like is our ability to manipulate them using well understood low-level causal properties," [136] Giere also concludes that, despite the truth of perspectivism, "We know that randomized clinical trials are more reliable than prospective studies . . . because

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[131] Ian Hacking, "Experimentation and Scientific Realism," *Philosophical Topics*, Vol. 13, No. 1, (1982), 71-2.
[132] Ibid.
[133] Ronald N. Giere, *Science Without Laws* (Chicago: University of Chicago Press, 1999), 4.
[134] Ronald N. Giere, "The Perspectival Nature of Scientific Investigation," (paper presented at Philosophy of Science Association, 2000), 3.
[135] Ibid., 2.
[136] Hacking, "Experimentation and Scientific Realism," 86.

they are more effective at eliminating alternative causal explanations for observed differences . . . the desirable characteristics of scientific methods are things like reliability, discrimination, efficiency, sensitivity, and robustness. . . . [One determines] the superiority of a given method in these terms."[137]

My point is that, like Hoffmann, Hacking and Giere admit of the ambiguities of the physical world and of scientific investigations into it; however, also like Hoffmann, they fail to break away from what is, seemingly, a deeply held conviction for the value of explanatory power over other measures of value. Lacking in the work of Hacking and Giere is even the deficient sketch for a scientific value, e.g., beauty, that Hoffmann offers. If these three figures are indicative, then to the extent that scientists take up philosophical interest after their scientific work, they tend toward the philosophical pursuits – philosophy of science, metaphysics, epistemology – that bear the most directly for scientists. Further, this unfortunate truth is true only in so far as scientists have philosophical training at all. Many do not have philosophical training, and among those who do not, their blind spots are larger, lacking even the critical epistemology, say, of those with philosophical training. What the natural sciences need, and badly, is more in the way of value theory.

III. The Need for New Scientific Values

Perhaps here, one wonders why natural scientists should not have the values that they have (namely explanatory power and ostensible utilitarianism). While I will elaborate Nietzsche's aesthetic values, the problem for natural scientists today runs deeper than an evaluative disagreement. Scientists are too good at what they do. Owing to a long-standing privileging of explanatory power, scientists are the most effective explainers and predicters whom the world has ever seen. Today's natural scientists have never been more effective at

[137] Giere, *Science Without Laws*, 27.

challenging forth the world – manipulating it in new, increasingly powerful, increasingly diverse ways. Some admit that that they are in the business of science for uncovering truths about the natural world.[138] The catch is that our current academic model, i.e., research through publicly funded universities, forces them to write funding proposals that, by their own admissions, they secure through utilitarian justifications either way. That is, some scientists, in their professional practice, have to play the disingenuous game of pretending that they care about the practical consequences of their work to secure the funding that allows their work to continue. They practice the *de facto* nihilism that I have already mentioned, which chases any money anywhere.

Other scientists want to better the world. In the latter case, making "better" tends to mean making optimific; they evaluate in terms of cost-benefit analyses.[139] The larger philosophical problem here is that, with its increasingly precise and powerful methods, the scientific project is increasingly effective at realizing goods and services to the end of utilitarian values – longer lives with less pain, difficulty, discomfort, and unpredictability; however, it renders these values for those living in the present and near future at the expense of those in the distant future. The anthropogenic climate change (ACC) that has resulted from the natural sciences' increasing power for discovery, in service to the public demand for greater energy production (to meet greater energy consumption, to the end of greater longevity, pleasure, ease, comfort, predictability – life preservation, in a phrase), poses the single greatest threat to posterity.[140] Recent philosophical literature variously characterizes ACC, especially "abrupt climate change," as having "potentially catastrophic consequences"[141] and, more alarmingly, as being "a far greater danger to 'civilization' than Nazism . . . [through] the plague of suffering, disease,

[138] Dr. Eli Greenbaum, in discussion with the author, May 2018.
[139] Dr. James Kubicki, in discussion with the author, May 2018.
[140] Dr. Steve Best, in discussion with the author, December 2017.
[141] Eric Winsberg, *Philosophy and Climate Science* (New York: Cambridge, 2018), 230-1.

famine, extinction, violence, chaos, and warfare it will bring."[142]

Through their indiscriminate practice of asking any question that leads to more questions, in the service of their nominally useful sources of funding, natural scientists have given the world the means of producing more and more-powerful fossil-fuel-burning technologies. In turn, these technologies produce the positive-feedback loop of greenhouse-gas emission, planetary warming, ice melt, rising sea levels and temperatures, and increasingly violent and erratic weather. Today's natural scientists fail according to Nietzsche's values, but they fail according to their own values, too. To the extent that they care about optimific results, they currently provide them unsustainably. According to the best modeling available,[143] our longevity, pleasure, ease, comfort, and predictability come at the expense of posterity's fleetingness, pain, difficulty, discomfort, and unpredictability. Quite tenably, natural scientists will be responsible for a far-less-optimific world. The uncritical faith that is scientism sees salvation in *more* funding for scientific practice to produce more and more-powerful technologies, oblivious to the possibility that future generations of scientists and laypersons may see any potential solutions for us as their own generation's problems. I see salvation in a different kind of scientific practice.

IV. Nietzschean Aesthetics and Goethean Method: Toward a Tasteful Science of the Future

Finally, I turn toward an alternative to the natural sciences as seen through the lens of Nietzsche's aesthetics. I take as a case study Nietzsche's best-liked figure, polymath Goethe. In addition to being a statesman, novelist, poet, and philosopher of science, Goethe also made important contributions to anatomy, optics, and botany. Perhaps more importantly, he pioneered his own scientific method (Goethean science, naturally). Goethe is not only the best, but the only good model for a superior alternative to today's natural sciences through Nietzsche's eyes. He

[142] Steve Best, "The Rise (and Fall) of Critical Animal Studies," *Liberazioni: Associazoni,* (2013), 18, 20.
[143] Winsberg, *Philosophy and Climate Science,* 1-3.

"furnishes the standard against which the ideals of contemporary science, history, education and culture are to be evaluated and diagnosed as unhealthy; he is not the exception to the rule, he establishes the rule," as Jessica Berry argues.[144] As a neo-virtue ethicist, Nietzsche does not seek to formulate a model for excellent behavior and then seek, after the fact, which individuals do or do not roughly follow the model. Rather, he starts with who is undoubtedly an excellent individual in his eyes (he was a great admirer of Goethe's from childhood) and builds an account of ethical and aesthetic excellence from him. As such, I give an account of Goethean science and an account of Nietzschean aesthetics, the latter of which will shed light on Goethean science in descriptive and evaluative terms.

Fortunately, Goethe describes his own scientific process more than once. In a brief 1798 note, Goethe formulates his method:

> 1. The empirical phenomenon, which everyone finds in nature, and which is then raised through experiments to the level of 2. the scientific phenomenon by producing it under circumstance and conditions different from those in which it was first observed, and in a sequence which is more or less successful. 3. The pure phenomenon now stands before us as the result of all our observations and experiments. It can never be isolated, but it appears in a continuous sequence of events. To depict it, the human mind gives definition to the empirically variable, excludes the accidental, sets aside the impure, untangles the complicated, and even discovers the unknown.[145]

Goethe starts with observation. Crucially, though, he starts with bare observation, "examining what is and not what pleases" rather than "the direct application of an experiment to prove some hypothesis."[146] By "what pleases" here he means what would work to confirm an existing account of the natural phenomenon in question (as confirmation keeps comfortable rather than

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[144] Jessica Berry, "Nietzsche's Scientific Community: Elective Affinities," in *Individual and Community in Nietzsche's Philosophy*, ed. Julian Young, (Cambridge: Cambridge, 2015), 100.
[145] Johann Wolfgang von Goethe, "Empirical Observation and Science," in *Goethe: Scientific Studies*, ed. Douglas Miller (New York: Suhrkamp, 1988), 26.
[146] Johann Wolfgang von Goethe, "The Experiment as Mediator of Object and Subject," in *In Context* #24 (Fall, 2010), 19-21.

making uncomfortable). Goethe rearranges the steps of the conventional scientific method, then. Rather than seeking to confirm an already-established hypothesis, Goethe seeks to set aside any pre-existing prejudices. Only after many observations of phenomena does Goethe proceed to make any predictions, which he then tests via experiment. Here, another difference between Goethean science and much of today's scientific project (though notably like Hacking's account of experimentation). While Goethe and today's scientists experiment to isolate variables of a phenomenon, Goethe does so "under circumstance and conditions different from those in which it was first observed." That is, he seeks to create "phenomena that do not naturally exist in a pure state," in Hacking's words. Unlike scientists aiming for replicability, Goethe aims for novelty, and unlike Hacking's account, Goethe has in mind something different. The "successful . . . sequence" that Goethe describes is a series of visual stills, or short experiential clips, the gaps of which he then fills in intuitively. His so-called "pure phenomena" and elsewhere *Ur-phänomen* is an extra-sensory intuition; he has a vision of, for example, intermediary leaves between those he actually observed, like Hume's missing shade of blue. The role that Goethe gives to intuition marks another important divergence between Goethean science and conventional science, of which he and others of his day were already aware.[147] He is seeking the spirit of the phenomena that he observes, which is not itself sensible.

By starting in the realm of bare observation, Goethe effectively begins scientific investigation in the same way we often characterize the aesthetic attitude – our so-called disinterested disposition when observing a work of art. "Kant, like all philosophers, instead of envisaging the aesthetic problem from the point of view of the artist (the creator), considered art

[147] "With many characteristic strokes of the pen I caused a symbolic plant to arise before [Friedrich Schiller's] eyes. . . . but when I finished he shook his head and said, 'That is no observation, that is an idea.' . . . I mastered myself, however, and answered, 'It can be anything but disagreeable to me to have ideas without knowing it, and even to see them with my own eyes." Johann Wolfgang von Goethe, *The Autobiography of Goethe: Truth and Poetry from My Own Life*, (London: George Bell, 1900), 210.

and the beautiful purely from that of the 'spectator,' " Nietzsche notes, critically.[148] Likewise, Nietzsche characterizes Schopenhauer, who "made use of the Kantian version of the aesthetic problem,"[149] as a "pure perceiver" and "lecher" who "look[s] at life without desire" and wants "to lie prostrate before [all things] like a mirror."[150] Nietzsche is here characterizing the receiving pole on an aesthetic spectrum of receiving (questions of beauty and taste) and giving (questions of creation and style). Nietzsche is critical of the passive receiving aesthetic of Kant and Schopenhauer, and, curiously, he echoes Goethe who leveled a similar complaint decades earlier; Nietzsche begins "On the Uses and Disadvantages of History for Life" with that very remark.[151]

The crucial distinction between Goethe on one hand and Kant and Schopenhauer on the other is that Kant's and Schopenhauer's aesthetics stay in the state of passive reception – the conventional aesthetic attitude. By contrast, Goethe ultimately goes on to find the spirit (literally inspiration) for artistic creation as a result of his disinterested observation. Goethe is searching for a pure phenomenon, the *Ur-phänomen* that transcends any one phenomenon yet informs all of them. As Berry concludes, "the *Ur-phänomen* that appears is Goethe himself,"[152] through the synthesis of his sensory inputs, memories, and intuition. Unlike Virchow, Goethe only sets aside his "imaginative powers" and the rest of his subjectivity until after "the transition from experience to judgment, from knowledge to application."[153] That is, after experiment has borne out Goethe's predictions that he gathered from natural phenomena, his judgments take center stage. He "must be artistic in the sense that he must be unafraid to exercise a ruthless editorial

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[148] Nietzsche, *Genealogy*, 103.
[149] Ibid.
[150] Nietzsche, *Zarathustra*, 234.
[151] "In any case, I hate everything that merely instructs me without augmenting or directly invigorating my activity." Nietzsche, "On the Uses and Disadvantages of History for Life," in *Untimely Meditations*, 159.
[152] Berry, "Nietzsche's Scientific Community," 115.
[153] Goethe, "Experiment," 20.

eye, to be selective, to prune and parse and judge, to reject and then to transform whatever raw material is left over as if it were the plastic material of some art."[154]

Berry's account of Goethean science goes far to establish its value in Nietzsche's philosophy of science, yet she does not develop the implications for Nietzsche's aesthetics which are simply beyond the scope of her project. Notably, the judicious selecting and neglecting that Goethe ultimately exercises in creating the particularly botanical manifestation of the *Ur-phänomen,* the *Ur-pflanze* (original or primordial flower) cuts to Nietzsche's account of taste. Though Nietzsche helped to shift aesthetic concerns from those of the eighteenth century – beauty and taste – to those of creation and style in the nineteenth century, his scattered remarks about taste form a clear and consistent picture. Of the different senses of the word "taste," the narrowest or strictest refers to preference. Preference, of course, entails choosiness. From *The Gay Science*: "this is bad taste, this will to truth, to 'truth at any price' . . . Today we consider it a matter of decency not to wish to see everything naked. . . . 'Is it true that God is present everywhere?' a little girl asks her mother; 'I think that's indecent' – a hint for philosophers!"[155] Nietzsche makes the point clearer in *Twilight of the Idols*: "My taste, which may be the opposite of a tolerant taste, is in this case too far from saying Yes indiscriminately; it does not like to say Yes; rather even No; but best of all nothing."[156] In part, his taste points subtly to his general emphasis on the importance of rarity in ethical and aesthetic evaluations (as I stressed in Chapter 2). To say Yes to too much of the stuff of aesthetics is to say Yes to none of it. A Yes only carries any value in contrast to a No; importantly, a Yes carries value directly proportionally to how many Nos it punctuates. In the extreme, the only Yes amidst indefinite Nos receives the highest possible appraisal according to one taste.

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[154] Berry, "Nietzsche's Scientific Community," 101.
[155] Nietzsche, *The Gay Science*, 38.
[156] Nietzsche, *Twilight*, 556.

When Goethe "excludes the accidental, sets aside the impure," he is exercising the aesthetic discrimination that Nietzsche endorses. His *Ur-pflanze* is an amalgam of the particular plants he observed. The quick sketch that he made for Schiller was not a sketch of a typical plant or of an idealized plant. It was a sketch of an archtype, and that archtypical *Ur-pflanze* only came into being in Goethe's mind through artful emphasizing and ignoring on his part. The sketch represents Goethe's taste for the particular leaves, petals, stamens, and perhaps fruit of his observations. More importantly, it betrays the botanical parts for which he does not have a taste. "There are many empirical fractions that must be discarded if we are to arrive at a pure, constant phenomena," Goethe himself argues.[157] The one amalgamated, archtypical plant that is to stand for all of its type mates has finite room for details – its constituent elements. Being incapable of embodying all of his observations, Goethe had no choice but to practice conceptual pruning. Had he been tasteless, then the act of creating his archtypical *Ur-pflanze* would have been impossible.

By contrast, today's conventional scientists have an inclination for Nietzsche's contrast for good taste. They bare, as it were, the stuff of their observations. "An interpretation that permits counting, calculating, weighing, seeing, and touching, and nothing more – that is a crudity and a naïveté, assuming that it is not a mental illness, an idiocy."[158] It is worth noting that Nietzsche still characterizes this conventional (mechanistic) scientific approach as interpretation. The naïveté here refers to the attempt to turn a subjective experience into an objective fact. The numbers involved in the counting, calculating, and measuring are not objective, on Nietzsche's account; they are merely intersubjective. Mathematical language is, even more so than natural language, the metaphysics of the people. If knowledge is, as Nietzsche contends, "[n]othing more than this: Something strange is to be reduced to something *familiar*," which is grounded in

[157] Goethe, "Empirical Observation," 25.
[158] Nietzsche, *The Gay Science*, 335.

"*the instinct of fear*," then scientists who practice quantitative investigations are especially afraid of the phenomena that they investigate.[159] We learn numeric tables at an early age. Numbers are ubiquitous in most facets of "civilized" society. Measuring, weighing, and otherwise quantifying the stuff of observation renders it familiar, same, fungible, predictable, and safe; however, quantification is still a human projection from fear (or at least discomfort) of the unknown into the stuff of appearance – not a law that one uncovers from it. To believe otherwise would be naïve.

As an aesthetic, the mathematical interpretation is lowest-common-denominator; therein lies its crudity. As though the insecurity with an unknown, ultimately unknowable phenomena were not great enough, conventional, quantifying scientists seek more assurance still from a shared projection. Reducing a phenomenon to familiar numbers is comforting; reducing it to the numbers that we know are familiar to our peers, and that we know they also find that quantification familiar reassures us further. It is as though conventional scientists cannot rest assured without the nodding confirmation of their peers – as though the stuff of their bare mental states were not evidence enough. They are still rather like Virchow, seeking to jettison as much of their own phenomenal investigation as possible rather than own their subjectivity. Nietzsche describes this goal is "to castrate the intellect."[160] Whereas Goethe organizes his faculties – first sensing, then intuiting, then thinking, then judging – conventional scientists seek to rid their senses of much of what gives them potency and seek to replace those faculties with measurements. In addition to castrating the intellect, science of quantification cuts into the stuff of observation. Precision – literally a cutting off – demarcates, makes clear, by cutting a phenomena into parts that are separated from one another. The lines on a yardstick or scale

[159] Nietzsche, *The Gay Science*, 300-1.
[160] Nietzsche, *Genealogy*, 119.

represent cut-off points, i.e., the places at which the stuff of perception becomes cut off from itself (from its other "parts"). Precision is incision. The accuracy that results comes through a violence to the self (cut off from faculties) and to the stuff of perception (cut off from itself through the quantifying projection). To measure a plant is not to observe that plant; to measure a plant is to observe the tool(s) of measurement or of the measuring process itself. As a result, the precision of the quantifying approach to science does a third violence: the scientist is cut off from the phenomena that are constituents of the same physical world.

Goethe, by contrast, asserts his subjectivity in scientific investigation. As a result, scholars as far back as Rudolph Steiner have characterized Goethean science, anachronistically yet otherwise accurately, as phenomenological.[161][162] Much of this characterization rests on the place that Goethe gives to intuition, which I have already stressed. Moreover, Goethean science is a "participatory methodology" and "intimate relationship" between observer and phenomenon that "places responsibility on the scientist and allows for the development of the scientist in the process."[163] As Dana Pauly explains, "Goethe puts faith and trust in the aesthetic and thinking capacity of the human being" because "[s]cientific study should bring us closer to nature, not separate us further from our experience" since "the very patterns we see in nature are visible to us because we are a part of nature and therefore the patterns are also in us."[164] Goethe's phenomenological science, then, simultaneously allows for a greater place for the scientist and does a greater service to the stuff of observation. By allowing for the intuitive faculty – the imaginative power that produces an artful composite of the many specimens in question –

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[161] Rudolf Steiner, *Goethean Science*, trans. by William Lindeman (Mercury Press, 1988), 82.
[162] David Seamon and Arthur Zajonc, *Goethe's Way of Science: A Phenomenology of Nature* (New York: SUNY Press, 1998).
[163] Dana Pauly, "Goethean Science: A Phenomenological Study of Plant Metamorphosis," in *BIODYNAMICS* (July/August, 2000), 22-3.
[164] Ibid.

Goethean science rejects Virchow's goal, which conventional scientists tacitly accept.

The aesthetic picture that emerges does betray something about taste in the stricter or narrower sense with which I started: simply matters of preference (quantitative investigation for conventional scientists and qualitative ones for Goethe). More importantly, what starts to emerge is a matter of good and bad taste; that is, I hope to have made a case for the superior tastefulness of Goethean science as compared to conventional scientific practice. Conventional botanists will weigh or measure or splay open any plant – strip bare any phenomena – which does not admit of much in the way of choosiness. Goethe prunes carefully, judicially, with an evaluative eye. "In each individual case," Goethe writes, "The scientific researcher . . . is careful to note not only how the phenomena appear, but also how they should appear."[165] To cultivate aesthetic preference at all, one has to cultivate aesthetic sensitivity, which is impossible for a scientific practice of a cut-off perception. Though Goethe relegates his judgments (the domain for his "should" claims) to the end of his investigation, his aesthetic judgment remains intact and organized within his overall process.

My own "should" is for conventional science to allow its practitioners to cultivate more of their evaluative faculties. In this regard, aesthetics can be as informative as ethics. The good, as we often think of it, is that which, definitionally or conceptually, we either do or should want – to be, to have, to do. If this simple understanding of the good is true, then it follows that we should have (and should want to have) good taste regarding the stuff of perception. Here, too, Nietzsche proves informative. He gives frequent examples of his own taste, including his taste for tastes. That means not merely his preference for preferences, but his aesthetic metric by which any of us are to evaluate taste. We have already seen that taste, for Nietzsche (as for anyone else) requires some discrimination – we should have limits to the kinds of sights we want

[165] Goethe, "Empirical Observation," 25.

to see and how we want to do the seeing. He goes further: "a well-turned-out person . . . has a taste only for what is good for him; his pleasure, his delight cease where the measure of what is good for him is transgressed."[166] Nietzsche has in mind here good health; thus, a good taste is one conducive to good health.

A response I imagine many natural scientists making here is that they, too, have good taste to the extent that their investigations pay the bills in the first place and produce new phenomena – medications, safety precautions, and the like – in the second place. This response, for Nietzsche, points to the difference between life preservation and life affirmation. He clarifies: "Definition of a vegetarian: one who requires a corroborant diet. To sense what is harmful is harmful, to be able to forbid oneself something harmful, is a sign of youth and vitality. The exhausted are attracted by what is harmful: the vegetarian by vegetables. Sickness itself can be a stimulant to life: only one has to be healthy enough for this stimulant."[167] This puzzling comment stands apart from the many comments by Nietzsche that strike twenty-first-century readers as pseudo-scientific; surely even in 1888 nobody thought that vegetables were bad for anyone. Nietzsche's point seems to be that vegetarians play it too safe in their taste. By relegating their diet to comparatively safe, bland, or unadventurous foods, their taste rather puts distance between themselves and what would make us grow stronger. That meat, rather than say, spicy or exotic food should provide a solution is dubious, too, but his broader point remains apropos. A taste only for what is good for us may not cash out in terms of a taste only for what is safe or predictable. Experience tells us that inoculating ourselves at an early age to chicken pox will probably prove more conducive to our overall health than the attempt to avoid it entirely. The

[166] Friedrich Nietzsche, *Ecce Homo: How One Becomes What One Is*, trans. Walter Kaufmann (New York: Vintage, 1969), 224.
[167] Friedrich Nietzsche, *The Case of Wagner: A Musician's Problem*, trans. Walter Kaufmann (New York: Vintage, 1967), 165.

latter plan renders us dangerously weak against future exposure the older we grow.

We would expect Nietzsche to provide arguments supporting a taste for dangerous or adventurous things, then, and he does. His "free spirits" of the future, "full of malice against the lures of dependence that lie hidden in honors, or money, or offices, or enthusiasms of the senses" have "uninhibited fingers for the unfathomable, with teeth and stomachs for the most indigestible."[168] Elsewhere, he makes the point clearer: "broadly speaking, a preference for questionable and terrifying things is a symptom of strength; while a taste for the pretty and dainty belongs to the weak and delicate. . . . the heroic spirits . . . are hard enough to experience suffering as pleasure."[169] These comments are consistent with his broader account of aesthetics ("nothing but a kind of applied physiology").[170] As with erring too far toward a safe, predictable taste, though, a taste consisting *only* in terrifying or dangerous things seems anathema to good health, too. A dead scientist cannot have a taste for anything. To a lesser degree, too much of a taste for the "questionable and terrifying" is also, for Nietzsche, a bad taste (i.e., a bad sense of what is good for one).

To illustrate, Charles H. Pence has already offered an aesthetic reading of Nietzsche's tasteless man of science in *Thus Spoke Zarathustra*, who lives in a swamp and "is the master and expert [of] the *brain* of the leech . . . For its sake I have thrown away everything else; for its sake everything else has become indifferent to me."[171] Pence stresses one critical aspect of Nietzsche's critique of scientists, then and infinitely more now: hyper-specialization. Contra Goethe, Nietzsche's leech specialist has a store of knowledge about one extremely specific facet

[168] Nietzsche, *Beyond Good and Evil*, 55.
[169] Nietzsche, *The Will to Power*, 450.
[170] Nietzsche, *Nietzsche Contra Wagner*, 664.
[171] Nietzsche, *Zarathustra*, 362.

of life yet knows nothing about anything else, including of import – namely aesthetics.[172] The scientist may betray a general lack of taste in the broader sense (aesthetic sensitivity as such); however, Pence fails to elaborate the literary significance of the scientist's setting. In the first place, a swamp is a barren place; like the desert, it is bad soil (for new ideas). Nietzsche's conventional scientist is unimaginative. To *live* in a swamp, pursuing an ugly (literally dreadful) creature is also, perhaps, to have dived too deeply into the questionable and terrifying. It lacks refinement. If aesthetics is applied physiology, then Zarathustra's swamp scientist is the other too-extreme pole of Nietzsche's taste spectrum from the vegetarian. Rather than having too-safe of a taste, he has too dangerous of a taste. To have too much of a taste for safety is only one expression of "the exhausted [being] attracted by what is harmful." To have too much of a taste for danger is another. The final takeaway is that good taste is, for Nietzsche, about what his neo-classicist aesthetics in general are about: a harmonious balance between constituent elements that are otherwise in tension – attractions to safe and dangerous experiences.

[172] Charles H. Pence, "Nietzsche's Aesthetic Critique of Darwin," in *History and Philosophy of the Life Sciences*, Vol. 33, No. 2 (2011), 181.

Conclusion

Rather than more funding for big technoscience, I propose the alternative solution of *less* funding for less big, technoscientific research rooted in reduced demand for technology. The increasingly powerful lock-picking science, deficient in values, will open fewer locks to what might be Pandora's box only if the demand for more disclosure shrinks. The crux of this solution is a matter of taste. As a faculty for preference, taste requires discrimination. The glutton and the gourmand both eat a lot of food; however, only the latter has any taste, for only the latter is choosy about what to eat. Likewise, the preference for as many scientific investigations as possible at the expense of the best scientific investigations should end. Some investigations should be off limits; their very suggestion should ring ugly to the scientific ears that hear them. In this way, the power to affect the world in potentially catastrophic ways becomes diminished. This aesthetic crux of taste, I should note, applies both to the scientific practitioners themselves and the members of the public who ostensibly justify the funding, and provide the demand for the fruits of scientific investigations.

Nietzsche argues that "the sick should not make the healthy sick . . . but this requires above all that the healthy should be segregated from the sick,"[173] pointing to the tendency for the physical world to condition what it surrounds, including us. Nietzsche means that those with unchecked consumption, who are unwilling to question their *de facto* nihilism, run the risk of spreading that nihilism to others. We must conclude equally from his dictum, though, that the sick should be segregated from the healthy. His "free spirits" of the future, "not only strong, but also daring to the point of recklessness,"[174] pose as much risk to the value (life preservation) of the many as the many pose to the values of the most-experimental few: prodigality, struggle,

[173] Nietzsche, *Genealogy*, 124.
[174] Nietzsche, *Beyond Good and Evil*, 41.

challenge, growth, and spontaneity – in a phrase, life affirmation. Much of the value of experimentation, the creation of new phenomena, is also the destruction of something old – of old phenomena and often of old beliefs. The most-daring experimenters are those willing to make an ultimate sacrifice through an expression of *Rausch*, or intoxication with the world. The invention of gunpowder has made both for some wonderful spectacle and some violent explosion. Nietzsche's argument that "the pathos of distance ought to keep their tasks [those of the healthy and sick] eternally separate" entails that the healthy and sick both continue on Earth; however, those who enjoy the spectacle of a nice fireworks display have to live spatially removed from those reckless enough to create it lest they risk exploding before they see it, and those daring experimenters have to live spatially removed from those who privilege safety lest the invention never materialize.

Nietzsche's "last man" is the society with no more taste for danger, adventure, or self (re-)creation – only for safety, warmth, and comfort; hence they are the endpoint of our species. Alice Benessia and Silvio Funtowicz have echoed Nietzsche's worry of the last man:

> [W]e are acquiescing to the idea that we should live in a world of happiness, in which we are never late, never lost and, most of all, never unprepared. . . . [W]e *cannot* be late, lost or unprepared. It is a world, therefore, in which our relationship with the unknown is tacitly eliminated. This form of technological eradication of uncertainty entails renouncing of the fundamental sources of human creativity and learning: our capacity to adapt to complexity and the unexpected. This in turn implies a new contradiction, intimately related to the first: what seems to make us safer and more efficient may be the cause of heightened vulnerability to change.[175]

Even after some critical reflection, many may still find such a chilling picture of the future preferable to the world of today, with its last remaining shreds of surprise. Crucially, though, many, including the author, already find too much to dislike about what Benessia and Funtowicz

[175] Alice Benessia and Silvio Funtowicz, "Never Late, Never Lost, and Never Unprepared," in *Science on the Verge*, (Consortium for Science, Policy, & Outcomes, 2016), 105.

go on to characterize as the "Internet of Things" – the march toward a network of people, ideas, and widgets that is binding in its tight-knit structure, boring in its reliability, and utterly claustrophobic. The degree of interconnectedness Benessia and Funtowicz see in our future amplifies the barren intellectual landscape I have described, especially in Chapter 2, by orders of magnitude. The uniformity of technoscience that is necessary for the Internet of Things – the satellite network, the transportation and electronic infrastructures, the merging of *mensch* and machine, and so on – create a grid the size of which becomes harder and harder to sustain, leave, or even question.

A possible solution to the long-term incoherence and unsustainability of de-facto nihilistic scientists in inauthentic service to nominal utilitarianism (actual tasteless greed and hedonism) is a large space that is off limits to all but the most-daring, most-tasteful investigators. As some investigations should be off limits, some parts of the world should be off limits for the concentrated masses of demanding consumers and their radically transformative lifestyles. Such a space – I call it "Goethe's Gulch" – is for the captains of culture: healthy, well-rounded individuals who consent to the *Neid* of the space in order to become greater creators. By leaving such a space more or less pristine, the world sets a hard cap on the limits of its quest for more life preservation. The fossil fuels, precious metals, and the other materials that enable the Internet of Things would have to remain locked in the Earth rather than exploited. Nietzsche's daring investigators, who have little value for what coal, gold, or silicon currently provide us, leave almost no impact compared to those in civilization; their sense of independence and value for overcoming are incompatible with large environmental footprints. Putting a large spatial distance between the Internet of Things and Goethe's Gulch ensures that each group of spirits can live the life it wants without threatening the values of the other. Like Nietzsche's favorite gift-givers –

gold and the sun – Goethe's Gulch gives from afar. It will act as a clarion call for adventurers, its far-off distance from the Internet of Things and relative inaccessibility ensuring that only those willing to overcome the hardships along the way attempt the journey. In this way, a tasteful science, à la Goethe, can grant us sustainability and guarantee continued diversity of thought.

The only danger that Nietzsche saw in *Neid* is the emergence of a too-excellent individual. Periodically, one easily outcompetes all of her/his peers and earns the *ostrakon* for the good of the city – so that the contests driving its residents to higher heights do not dry up. Much of the point of Goethe's Gulch and its pathos of distance is the absence of the stifling effects of the city. The free spirits who made the journey did so to reject the warmth of many neighbors in exchange only for challenging friends. Citing peerless warrior Miltiades, Nietzsche describes how, because peerless, he "has only the gods next to him – and therefore he has them against him. They seduce him to an act of *hybris*, and under it he collapses."[176] Ostracization is supposed to be the less-tragic method of reinvigorating contest in the wake of the peerless. In Goethe's Gulch, though, the peerless find their peers. The tragedy of hubris' collapsing effect vanishes. The increasing dangers past the Internet of Things act as a gatekeeper, such that those who would otherwise stand alongside only "the gods" now find one another alongside whom to stand. As a result, the artistic scientific competitors become like gods themselves – legends who live past themselves, scientizing to conquer, and transcending their human, all-too-human origins; they become post-human.

[176] Nietzsche, "Homer's Contest," 7.

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