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Intercultural Reading of the Autobiography of  
Michael Pupin: Science, Narration, and Nation

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Михајла Пупина: наука, наратија, нација

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## **Интеркултурално читање аутобиографије Михајла Пупина: наука, нарација, нација**

Ова докторска дисертација истражује интеркултуралне аспекте аутобиографије Михајла Пупина, *Од паињака до научењака*, која описује Пупинов рад као научника и његов пут од Србије до Америке. Аутобиографија нуди романтично-идеалистички системски поглед на свет по којем народна слобода служи 'прогресу', у којем је сваки аспект живота "креативно координан" кроз песничку визију, и у хармонији је са класичним врлинама. Песничка визија укључује интеркултурални аспект, т.ј., уводи дијалог између разноврсних обичаја или при томе интеркултуралне вредности одређене културе укључују и науку. Ова дисертација истражује паралеле између аутобиографије и теоретске парадигме која тражи уважавање аутентичности наратива о интердисциплинарном и интеркултуралном дијалогу у радовима мислилаца као што су Јохан Готфрид Хердер, Платон, Ерих Ауербах, Езра Паунд, Јулија Кристева, Поул Рикер, Пјер Адот, Ханс-Георг Гадамер и други. Пупин уређује разне културе по симболичној хијерархији која посматра ванматеријалне аспекте те наведене субјекте до њихове духовне вредности и разврстава их према блискости класичним врлинама. Циљ овог система, који може да се опише као инхерентно песнички, а прагматички као научни, јесте да организује субјекте за практично достигнуће већег добра, одакле проистичу и прагматизам и романтични идеализам. То значи да је његова критика идеја, које су биле све важније у његово доба, као што су атомизам и еволуционизам, умерено тако да је тражио оне идејне аспекте који су могли бити практично примењени за 'добро'. На пример, он везује еволуцију са идејом прогреса коју изражава као историјску прилику за прављење идеалне демократије. У Српској књижевности, његов рад може да се пореди са радом Николе Тесле, Јована Цвијића, Милутина Миланковића и Михаила Петровић Аласа, а у Америчкој или са њом везаном књижевности, Томасом Едисоном, Албертом Ајнштајном и Бетрандом Руселом. Аутобиографија може да се чита као алтернатива наративном сцијентизму, која се може наћи и у раду мислилаца као што су: Мартин Хајдегер, Метју Арнолд и Џон Раскин, кроз софистицирани поглед човека и своје културне и технолошке креације. Због Пупиновог интеркултуралног прилаза, његова аутобиографија има следеће аспекте: реторички, философски, политички, научни, културални и интерпретациони или херменеутички.

**Кључне речи:** Пупин, Михајло, интеркултуралност, песништво, наука, национални идентитет, романтични идеализам, класика

Књижевност, Српска и Америчка књижевност

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## **Intercultural Reading of the Autobiography of Michael Pupin: Science, Narration, and Nation**

This doctoral dissertation examines the intercultural aspects of Michael Pupin's autobiography, *From Immigrant to Inventor*, which concerns his work as a scientist and his journey from Serbia to America. The autobiography outlines a romantic idealist aspiration that national freedom serves a 'progress' wherein each aspect of life is creatively coordinated in a poetic vision tempered by classical virtues. The poetic vision involves an intercultural aspect, i.e., the involvement of dialogue among various customs or intellectual precepts of particular societies, including science. The dissertation proposes that parallels may be drawn between the autobiography and theoretical frameworks seeking to maintain the authenticity of the narratives of interdisciplinary intercultural dialogue in the works of thinkers such as Johann Gottfried Herder, Plato, Erich Auerbach, Ezra Pound, Julia Kristeva, Paul Ricoeur, Pierre Hadot, Hans-Georg Gadamer, and others. Pupin orders various cultures according to a symbolic hierarchy that looks beyond the material aspects of given subjects to their spiritual qualities and ranks them in imitation of classical virtues. The purpose of this system, which may be described as pragmatically poetic, is to organize subjects for the practical attainment of a greater good, thence the pragmatism and romantic idealism. This means that his critique of ideas gaining currency in his day, like atomism and evolutionism, was such that he sought from those ideas aspects that could be applied practically to 'good.' For example, he connects evolution to the notion of progress, which he expresses as the historical opportunity to create an ideal democracy. In Serbian literature, his work could be compared to that of Nikola Tesla, Jovan Cvijić, Milutin Milanković, and Mihailo Petrović Alas; in American or related literature, Thomas Edison, Albert Einstein, and Bertrand Russell. The autobiography may be read as an alternative narrative of scientism similarly forwarded by thinkers like Martin Heidegger, Matthew Arnold, and John Ruskin, providing a sophisticated alternative view of man and his cultural and technological creations. Because of Pupin's intercultural approach, his autobiography has the following aspects: rhetorical, mythical, philosophical, political, scientific, cultural, and interpretative or hermeneutical.

**Key Words:** Pupin, Michael, interculturality, poetry, science, national identity, romantic idealism, classical

Literature, Serbian and American literature

UDK:

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## 1. Introduction

Reading Michael Pupin's *From Immigrant to Inventor* presents an inspired narrative about interculturality and science that could be readdressed to useful effect in the contemporary world particularly in terms of the present difficulties that Pupin along with other Victorian writers foresaw, yet this same narrative also presents at least two problems for a certain kind of reader today. First is the necessity of reconstructing the context of the culture, science, classically-influenced literature and history *of the time during which it was written*—which is a hermeneutical not just historical concern. Second is the question of how to include that context in current academic discourse, which is ostensibly diametric, especially if we are to consider the project of thinkers such as Habermas or Foucault and other intermediary thinkers. The goal of this introduction is to justify the consideration of a thinker and writer who could be classified as Victorian in a postmodern age.<sup>1</sup> The term ‘Victorian’ is used here to refer to not only that period in history (the early 19<sup>th</sup> to the early 20<sup>th</sup> century) but as shorthand for the myriad polymaths with a classical education to emerge not only as professionals in various fields such as science or politics but also as writers, interestingly also with a strong interest in, for lack of a more connotative English word, *civitas*. It is argued that we continue to live in what may be described as the postmodern age not only because it reflects, for example, the media effects written about by Baudrillard, but also because scholars today, even those concerned with nation and narration like Homi Bhabha, continue to draw on thinkers like Foucault and Derrida.

The very words ‘Victorian’ and ‘postmodern’ imply the critical role played by history, even though this paper is being written from within the confines of the literary, the philological. The changing historical context is important to a hermeneutic reading, but it might also be added that the poetic aspects of this ‘older’ literature provides a way to think through the modern mechanisms of an increasingly technological society, which writers like Elémire Zolla, Kenneth Burke and Martin Heidegger saw as a threat. Zolla, professor of American literature at the University of Genoa, was brought to the attention of English-

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<sup>1</sup> Movements, where they become a disposition beyond the historical timeframe of their emergence, will not be capitalized. This will also hold for classicism or the classics wherein learning from the ancient Greeks was observed beyond any one historical period. This distinction will be less rigorously insisted on regarding Romanticism, a term usurped by Victorianism (e.g. in the classification of Ruskin).

speaking audiences by American literary critic Guy Davenport in an essay now compiled in *Geography of the Imagination*. He was presented as having written a book in which the villain was Progress,<sup>2</sup> and his work provides an interesting critical stance towards post-Victorian developments. Zolla has written extensively about the “labyrinth” which emerged from the traumatic shock of the Industrial Revolution: he demonstrates how few writers saw a way out of this labyrinth, or even sought to reject it.<sup>3</sup> Incidentally, parallels can be found in the dialogue of Plato’s dialogues, most notably in *The Sophist*, where the sophist is described as having hidden himself in a place we cannot explore and as an imitator of realities evades transparent cross-questioning, which would bring the labyrinthical wandering to rest through casting out conceit.<sup>4</sup> To posit that most people accept the status quo of an age or even patterns of thought would reinforce Heidegger’s view that man would become subsumed to the automatic processes he had put in place, causing him to forgo the poetic, i.e. not strictly material, creative component of reality (*poiesis*). It is worth noting that the Platonic dialogues, which were familiar literature to educated Victorian writers, also address this problem; most notably, the allegory of the cave in book four of *The Republic*<sup>5</sup> and, with regards to poetry and how few practice it (poetry being anything that passes from not being to being and the method by which the happy acquire good things), *The Symposium*.<sup>6</sup> Furthermore, Plato’s Socrates placed great importance on earlier thinkers, a theme recurrent in the Platonic dialogues, but to remain with the works already cited, he says in *The Sophist* that it is harsh and improper to impute famous men of old with falsehood.<sup>7</sup> It is argued here that the historical dimension is very complex and in order to be at least approximately understood is to draw on the tools of the elenctic method of engagement that has as its goal not the repetition of being lost and ‘ambiguous-being’ but the reaching of new plateaus of understanding and being. It is worth noting the project of Homi Bhabha’s *Nation and Narration* to explore the ambivalence in the language of the

<sup>2</sup> Guy Davenport, *The Geography of the Imagination* (Boston: David R. Godine, 2005), 354.

<sup>3</sup> Elemire Zolla, *The Eclipse of the Intellectual*, trans. Raymond Rosenthal (New York: Funk & Wagnalls, 1968).

<sup>4</sup> Plato, *The Sophist*, trans. Harold N. Fowler (Cambridge: Harvard University Press, 1921), accessed February 4, <http://www.perseus.tufts.edu/hopper/text?doc=plat.+soph.+216a>, 239, 235, 230, respectively.

<sup>5</sup> Plato, *The Republic*, trans. Paul Shorey (Cambridge: Harvard University Press, 1969), accessed February 4, <http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0168%3Abook%3D4%3Asecti%3D419a>.

<sup>6</sup> Plato, *The Symposium*, trans. Harold N. Fowler (Cambridge: Harvard University Press, 1925), accessed February 4, <http://www.perseus.tufts.edu/hopper/text?doc=plat.+sym.+172a>.

<sup>7</sup> Plato, *Sophist*, 243.

construction of the nation poses a series of questions in the introduction<sup>8</sup>—questioning, for the purposes of this introduction, being taken as the foundation of an interpretative, close reading of any subject.

In *The Beginning of Philosophy*, Gadamer explains that whether it is apparent or not mankind is engaged in a continual conversation with tradition, and that texts must be continually questioned so that they answer in a different way each time.<sup>9</sup> We shall see in this work that Pupin does this. To cease conversation with the past is to lose the way. Davenport writes about the importance of conveying messages in communication and how easily the past can be forgotten: “When myth exhausts its power to transmit messages (how to marry, how to eat, how to behave) ... it becomes a narrative that does not know how to resolve itself. Everything, says the contemporary novel, comes to a bad end... Before ... we were savages terrified of thunder, worshipful of fermented grape juice, wondering whether the gods allow us to marry our sister, first, or second cousin. We still have no information as to how races branched out from each other, where we first lived, where civilization arose. Our past is forgotten. We can forget it again.”<sup>10</sup>

It will be argued here that is *poiesis* lost in some neighbourhoods of the 20<sup>th</sup> century labyrinth, together with the creative aspect of storytelling. While stories may be false they can also be true and crucial to instruction of the good life. While *poiesis* and storytelling are modes from the past, these paths are opened into the present through a present-day reading of Pupin’s autobiography.

While Gadamer nods to the great work done by thinkers such as Nietzsche or Schopenhauer, who in many ways ushered in the cognitive parameters of the age in which we live, he also critiques them for having misinterpreted some of the texts from which they drew their ideas. Though he respects these thinkers, who formed the context which Pupin inherited, Gadamer reveals that we must not take all of their revolutionary ideas as accurate. This is also the view of Zolla, who writes of Nietzsche’s work as “provocative dialectics”—and decidedly not a set of precepts.<sup>11</sup> Precepts are what lead to the good life,

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<sup>8</sup> Homi Bhabha, *Nation and Narration* (New York: Routledge, 1990), introduction.

<sup>9</sup> Hans-Georg Gadamer, *The Beginning of Philosophy* (New York: Continuum, 2001), 49.

<sup>10</sup> Guy Davenport, *Every Force Involves a Form* (San Francisco: North Point Press, 1987), 8.

<sup>11</sup> Zolla, *Eclipse*, 42.

and value judgments as such are found in Pupin's autobiography, which is classical in this respect—and may therefore need an apology in terms of more recent thought.

Habermas has said that the project of the post-modern is unfinished.<sup>12</sup> This could also be understood in terms of the fact that postmodernism is not a closed system—and rests on the notion of there being no original, but the taking on of a 'new' system of order, wherein cultural elements are reconfigured in multiple ways, leading to endless possibilities. Habermas writes that the emphatically modern document no longer borrows its power of being a classic from the authority of a past epoch, "instead, a modern work becomes a classic because it has once been authentically modern".<sup>13</sup> Ricoeur has pointed out the problematic of this approach, explaining: "Hermeneutics without a project of liberation is blind, but a project of emancipation without historical experience is empty."<sup>14</sup> Yet Habermas claims that the move away from "specific aspects of validity: truth ... authenticity and beauty" was for the "enrichment of everyday life"<sup>15</sup>—which seems rather ironic today, given that postmodern art is now accepted as divorced from mass culture, requiring a special education to be understood, and thus not good instruction for life in general. This is in opposition to the model to which Aristotle is attributed: in which one, universal system is established—leading to the good life.

There are misleading crossroads in the labyrinth: passages that look the same, but lead to different destinations. This is what de Tocqueville, who Pupin cites in his autobiography, called the "hypocrisy of luxury",<sup>16</sup> i.e. commodities that present themselves as having qualities they do not in fact possess. To illustrate, I would like to compare the

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<sup>12</sup> Jurgen Habermas, "Modernity – An Incomplete Project," in *The Anti-Aesthetic*, ed. Hal Foster (Washington: Bay Press 1983), 3-15, especially 13.

<sup>13</sup> *Ibid.*, 4.

<sup>14</sup> Paul Ricoeur, "Habermas," in *A Ricoeur Reader: Reflection and Imagination*, ed. Mario J. Valdes (Toronto and Buffalo: University of Toronto Press, 1991), 164. Ricoeur views Habermas as a "figure of transition" in social critique, 181.

<sup>15</sup> Habermas, "Modernity," 9.

<sup>16</sup> Alexis de Tocqueville, *Democracy in America*, accessed March 4, 2012, [http://xroads.virginia.edu/~Hyper/detoc/ch1\\_11.htm](http://xroads.virginia.edu/~Hyper/detoc/ch1_11.htm), ch. XI: "The handicraftsmen of democratic ages not only endeavor to bring their useful productions within the reach of the whole community, but strive to give to all their commodities attractive qualities that they do not in reality possess. In the confusion of all ranks everyone hopes to appear what he is not, and makes great exertions to succeed in this object. This sentiment, indeed, which is only too natural to the heart of man, does not originate in the democratic principle; but that principle applies it to material objects. The hypocrisy of virtue is of every age, but the hypocrisy of luxury belongs more particularly to the ages of democracy."

“lines of flight” of Deleuze and Guattari<sup>17</sup> with the “reader’s arc” of Ricoeur.<sup>18</sup> Both consist of invisible elements: the former in terms of the imperceptible microcracks of the rupture leading to escape—which can be invented without needing a prior model. I would like to stress that the former authors explain that these lines come at a price, both to oneself and to others, and that they can lead one to “crack up”. “Why is the line of flight, even aside from the danger it runs of reverting to one of the other lines, imbued with such singular despair in spite of its message of joy, as if at the very moment things are coming to a resolution, its undertaking were threatened by something reaching down to its core, by a death, by a demolition.” The latter—the reader’s arc—is also somewhat invisible, in that it moves from the context of the text, to the reader, to how the reader lives his or her life. This arc is to improve the quality of life—and that of others, which is a very different sort of line. Both lines have the ability to address the political, especially if we are to take into consideration Bakhtin’s explanation of the field of communication as a war ground of contending meanings and language. Both lines acknowledge that there are connections between the individual and the community. However, the former is more bent on demolition, and the latter on preservation. These examples are to set the theoretical precedent that will serve to support the value judgments in Pupin’s work.

Still, in light of Habermas’ assessment that the modernity project is still unfinished, it may yet be premature to judge the present state of affairs though signs point to a disaffection with the postmodern as with a disappointing trend.<sup>19</sup> While Habermas argues in favour of a project aiming “at a differentiated relinking of modern culture with an everyday praxis that still depends on vital heritages, but would be impoverished through mere traditionalism,”<sup>20</sup> it seems that his definition of ‘tradition’ has more similarities than differences from that of Gadamer. For the latter argues that texts should constantly be questioned.<sup>21</sup> This is also an underlying tenet in the *Parmenides*: the openness granted to the human being implies that the problem doesn’t only have to do with the truth, but also to

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<sup>17</sup> Gilles Deleuze and Felix Guattari, *A Thousand Plateaus* (Minneapolis: Continuum International, 1987), 192-208.

<sup>18</sup> Paul Ricoeur, “What is a text?” in *Reader*, 60.

<sup>19</sup> Nicholas Dames, “On the Theory Generation,” *n+1* 14 (2012), accessed February 4, 2013, <http://nplusonemag.com/the-theory-generation>.

<sup>20</sup> Habermas, “Modernity,” 13.

<sup>21</sup> Gadamer, *Beginning*, 101.

do with the multiplicity of opinions. Questions must be asked lest we adopt untruths or worse, become “mechanical”, complacent, or dogmatic. The same criticism Habermas had for the “failures of those programs that called for the negation of art”<sup>22</sup>—dogmatism and moral rigorism—could be said of the Romantic reading of the Presocratics that could no longer be considered ‘modern’ because the time when “antiquity was considered a model to be recovered through some kind of imitation”<sup>23</sup> was gone.

No good thinker is static—and Habermas, like Barthes, has made concessions that change how we might view his corpus. Habermas has conceded that language is not inherently political—which was one of the points he took Gadamer to task for. Furthermore, he has pointed to the poverty of a modernist project comprising “a rationalized everyday life” because “communication processes need a cultural tradition covering all spheres”.<sup>24</sup> There is good reason why more comprehensive, historic systems are more promising. We shall see how Pupin’s work, though an autobiography, simultaneously advocates an idealistic system involving science but with the aim to serve the spiritual side of man.

Many are the objections to a society based merely on ‘science’ and the Cartesian supposition that there is a single method by which to reach the truth, perhaps most memorably the Dionysiac, cryptic criticism of Nietzsche. Gadamer writes more soberly that the sciences are like ancient history in that they accumulate an indefinite quantity of experiences that can never reach the whole because the whole is not an experiential concept: it can never be given despite the pretensions of modern science.<sup>25</sup> The problem with modern science is in its exclusion of the participatory aspect of experience: “It is precisely this culture from which springs the ‘aggressiveness’ of understanding science, which always wants to become master of its object by means of a method and thus excludes that mutuality of participation existing between object and subject that represents the highest point of Greek philosophy and makes possible our participation in the beautiful, the good, and the just, as well as in the values of communal life.”<sup>26</sup>

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<sup>22</sup> Habermas, “Modernity,” 13.

<sup>23</sup> Ibid., 4.

<sup>24</sup> Ibid., 11.

<sup>25</sup> Gadamer, *Beginning*, 54.

<sup>26</sup> Ibid., 70.

The difference between Habermas and Gadamer (more on their connection in a moment) is that the former, unlike the latter, believes in a project founded on a new mythology of science—which is strongly argued to be a Romantic figment of the imagination by J.H. Randall, who writes of “the growth of a scientific faith in a certain method rather than any final scientific knowledge.”<sup>27</sup> Randall also places the shift in scientific thought to within the Romantic context: “science, in breaking from the narrow and fixed forms of 18<sup>th</sup> century mechanics and mathematics and being frankly inquiring and experimental, has felt romantic influence—leading to a Promethean revolt.”<sup>28</sup> The difference between Habermas and Gadamer, then, is in how they saw a break with the past. Davenport has pointed out that despite all the Modernism at the start of the century, it was oddly fascinated with ancient fragments: “If we say, as we can, that the archaic is one of the great inventions of the twentieth century, we mean that as the first European renaissance looked back to Hellenistic Rome for a range of models and symbols, the twentieth century has looked back to a deeper past ... What is most modern in our time frequently turns out to be the most archaic. The Sculpture of Brancusi belongs to the art of the Cyclades in the ninth century B.C. Corbusier’s buildings in their cubist phase look like the white clay houses of Anatolia and Malta...”<sup>29</sup>

It seems that the greater the familiarity one has with the past, the harder it is to conceive of any “break with the past” or to see any art that is without precedent. This is particularly true and complicated in considering that which is referred to as the product of the ‘primitive mind’—a problematic term, for if it were so ‘primitive’ then it would not be as consulted as it is, as testified to by the few examples listed in the Davenport passage above.

The “negation of art” described by Habermas has also become a negation of the past, which aside from marking a break with the views espoused in Pupin’s work is also revealing of new forms of dogmatism and philistinism. E.M. Forster has even disparaged the story, which is not to be expected of a novelist: “The more we look at the story ... the more we disentangle it from the finer growths that it supports, the less shall we find to

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<sup>27</sup> John Herman Randall, “Early 20<sup>th</sup> Century Currents of Thought,” in *Chapters in Western Civilization, Vol. II*, ed. Joseph Blau et al. (New York: Columbia University Press, 1954), 349.

<sup>28</sup> John Herman Randall, “The Romantic Outlook,” in *Chapters in Western Civilization, Vol. II*, 5.

<sup>29</sup> Davenport, *Geography*, 21.



admire. ... Neanderthal man listened to stories, if one may judge by the shape of his skull. The primitive audience was an audience of shock-heads, gaping around the camp fire..."<sup>30</sup>

With the category of myth having ostensibly been banished as the children's stories of yesteryear, which it possibly never was but was merely corrupted as such, the stories that remain have become negative, unresolved, unallegorical. Faith becomes hypocritical ("we keep superstitions that would make a Malay laugh") and science has provided no conclusive evidence of "where we first lived, how races branched out from each other".<sup>31</sup> Still, even today, we have—as in the *Parmenides*—but "possibilities"; no "final scientific knowledge". We shall see that perhaps myth can serve as important a role in a free play of thinking around and through scientific fact. To call myth or storytelling primitive is to misunderstand part of the human experience. Barthes, whose earlier work rejected the novel, changed his views in his last lectures, and began to write his own novel, which can be interpreted to speak to the necessity of the narrative tradition.<sup>32</sup> Certainly, this argues for the relevance of retaining links with the past.

While it is tempting to measure an academic idea in terms of how it fared in the life of the individual who came up with it, I am looking to underline two different points. Firstly, if the modernist project is unfinished, I would advocate Gadamer's position that we should revisit what is meant by the traditional and attempt to create a definition of it using the works of history that were so quickly and violently dismissed at the turn of the 20<sup>th</sup> century. While the Futurists' cry at the turn of the century to throw Tolstoy and Dostoevsky off the train of progress could be explained as the extremism of rebellious youth, a cursory glance at how much education has changed over the past one hundred years, such as permitting advanced study of literature even if one has no knowledge of its history, reveals that such declamations have entered the heart of contemporary culture in more than one way. The demolition of any ideas, be they posterior, but also the most extreme, only works to the impoverishment of an intellectual history; one need only remember when books were burned to understand that such acts are later regretted as misplaced zeal, dogmatism, or

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<sup>30</sup> E.M. Forster, quoted in Karl Kroeber, *Retelling/Rereading* (New Brunswick, New Jersey: Rutgers University Press, 1992), 5-6.

<sup>31</sup> Davenport, *Force*, 8.

<sup>32</sup> Sylvère Lotringer, "Barthes after Barthes," *Frieze* 136 (January-February 2011), accessed November 14, 2012, <http://www.frieze.com/issue/article/barthes-after-barthes/>.

philistinism. It would therefore be advantageous to enter into dialogue with the writings that emerged out of the Modern in terms of the literature that preceded it. Ezra Pound in *The ABC of Reading* assigns to the critic the task of revisiting the past, as well as other cultures. The book itself is a challenge to the contemporary wariness of hegemony, presenting itself as a guide to what should be read; a canon of sorts. “I am trying to give [the student] a list of authors who are unsurpassed IN THEIR OWN DOMAIN, whereas the writers whom I omit are demonstrably INFERIOR to one or more of the writers I include”, he writes in invitation of evaluation of multiple criteria 48; criteria based on comparison as well as first-hand observation.<sup>33</sup> “Without knowing Dante, Guido Cavalcanti and Villon, no one can judge the attained maxima of certain kinds of writing. Without the foregoing MINIMUM of poetry in other languages you simply will not know ‘where English poetry comes’.”<sup>34</sup> It may be concluded that the ability to rank is a privilege, but a privilege that ought to be made available to everyone, as was the educational ideal of Victorian thinkers like Matthew Arnold and John Ruskin. Of course, the easier solution reached in contemporary times particularly in mainstream society, though sadly in some educational contexts, is to relativise knowledge and chastise hierarchies as exclusionary, which they are when there is no education to initiate students to the literary pantheon so that one day they, too, would potentially be proficient to write a guide to reading like Pound.

In many instances, modernity has had an agenda. In having an agenda, ideas have either been moulded to fit this agenda, or have been discarded as being irrelevant. One could speak of Marx’s reading of history, and, for instance, admire his consideration of Giambattista Vico, but question whether he adequately applied Vico’s ideas of there being historical ages (of allegory, history, and democracy). According to Gadamer, it is a paradox to say that history is “developing.” The concept of development is a negation of history for it implies everything was already given at the beginning; development can thus merely be a becoming visible. In this sense, the point chosen as a beginning and the direction it takes both depend upon the goal. (Hence the theoretical attention at the beginning of this work.) So in many ways, “scientific progress” is such a negative goal and spreads weeds—like ragwort, from Corpus Christi in Oxford in 1830 made its way throughout the U.K. Botanist

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<sup>33</sup> Ezra Pound, *The ABC of Reading* (New York: New Directions, 1960), 17-18.

<sup>34</sup> *ibid.*, 57.

George Claridge Puce remembers its seeds floating in his carriage in the 1920's, drifting out at the final stop with the passengers. Understanding 'development' in that way would shed interesting light onto analysis of the evolutionary ideas of Lamarck, incipit in Erasmus Darwin's scientific poems, *The Temple of Nature* and *The Botanic Garden*,<sup>35</sup> as we shall see later. The very germination of these ideas cannot be plucked out of the philosophical climate from which they emerged especially because this is how myths are made, wherein the myth is a symbol plucked out of the specific and raised to the universal, outside of time. Still, we shall note that not all seeds sprouted in all land: Erasmus Darwin's ideas, for example, hardly influence Pupin's autobiography though had an influence during the time of his life.

To revisit a period when an intellectual idea gains currency is to see how fragile the economy of ideas is. The combination of truth and possibility makes for the creation of trends: in this way, it is now possible to speak of the rationalism, materialism, mechanistic logic, and individualism that emerged out of the Middle Ages in Western Europe, which gave rise to both a new form of literature, as well as the ideals of the French Revolution (e.g. Auerbach, and Dupré).<sup>36</sup> Alongside the image of the labyrinth to describe this literature is also the notion of the 'mechanistic'—a term from Matthew Arnold's *Culture and Anarchy*, but also used by Randall who wrote, "Explaining complex phenomena by isolating simpler elements ... meant the search for the mechanism involved: by suitable manipulation and combination ... the amazing technical triumphs of science [could be] achieved"<sup>37</sup>—thence the Arnoldian statement: "He who works for machinery ... only works for confusion. He who works for sweetness and light works to make reason and the will of God real."<sup>38</sup> The mechanical blinds as to the "something needful" and is like a talisman: isolated, all-sufficient<sup>39</sup> as opposed to allowing concessions to flow freely around a

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<sup>35</sup> Erasmus Darwin, *The Temple of Nature* (London: T. Bensley, 1803), accessed August 6, 2012, <http://knarf.english.upenn.edu/Darwin/templetp.html> and <http://www.gutenberg.org/ebooks/26861>. Erasmus Darwin: *The Botanic Garden*, accessed August 6 2012, <http://www.gutenberg.org/ebooks/9612>.

<sup>36</sup> Erich Auerbach, *Mimesis* (Princeton: Princeton University Press, 1974), Louis Dupré, *Passage to Modernity* (New Haven and London: Yale University Press, 1993).

<sup>37</sup> Randall, "Early 20<sup>th</sup>," 348.

<sup>38</sup> Matthew Arnold, *Culture and Anarchy* (London: Smith, Elder & Co., 1889), accessed February 20, 2013, <http://archive.org/details/cultureanarchyes00arno>, 16.

<sup>39</sup> Arnold, *Culture*, 117.

petrified rule of life.<sup>40</sup> This idea is hardly dogmatic and in fact requires much effort to be understood. It is being suggested here as it will be suggested that this type of complexity informed Pupin's interculturalism.

Kroeber writes that while storytelling is not always right, it is a necessary sign of freedom. Expression becomes something to be 'resolved'; a larger subject to be broken into parts in order to arrive at the truth of it, as the evolution of the word indicates. In this way, a fragment may serve a larger whole, just as the gibberish word play of the sophists in Plato's dialogue with that name feigns "ignorance of mirrors and water and of sight altogether, and will question you only about that which is deduced from your words" yet can be contained within the single name "image."<sup>41</sup> Some stories are ignorance and others are the single name. As there is no dogma, per se, that guides knowledge contained within stories, the stories may not always be 'right', but to allow for them to be told and to attribute importance to them allows for the possibility of the free play of ideas to bring understanding. Various stories: those similar and dissimilar to Pupin's will be addressed in this work in an attempt to tease out meaning. Sometimes understanding, as it is presented in *The Sophist*, juxtaposes understanding against what it is not for didactic and other purposes; without the existence of multiple stories and voices, the word coherence would not have meaning in a larger sense.

Understanding that the (single) world consists in a plethora of pluralities is what singles out Auerbach's survey of literature and his concluding chapter in which he writes that his work is but his limited view. Despite that, however, Said points out in the 50th anniversary edition introduction to the work, that greatness may emerge from recognition of limitations where supported by argument and intention: "But the triumph of *Mimesis*, as well as its inevitable tragic flaw, is that the human mind studying literary representatives of the historical world can only do so as all authors do – from the limited perspective of their own time and their own work. No more scientific a method or less subjective a gaze is possible, except that the great scholar can always buttress his vision with learning, dedication, and moral purpose."<sup>42</sup>

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<sup>40</sup> Arnold, *Culture*, 118.

<sup>41</sup> Plato, *Sophist*, 240.

<sup>42</sup> Edward Said, introduction to the fiftieth-anniversary edition of *Mimesis*, by Erich Auerbach (Princeton: Princeton University Press, 2003), accessed August 6, 2012, <http://press.princeton.edu/chapters/i50.html>.

A precedence of the willingness to seek out the multiple voices in existence, and even the task of doing so, can be traced to the writings of Plato (e.g. *Phaedo*) and Herder, the latter attributed with having introduced the concept of cultural relativism. A premise of this paper is that if there is still no satisfying definition of words like ‘tradition’, or no satisfying explanation of how ‘tradition’ should be ‘relinked’ to the present, persons interested in this problem should revisit the intellectual history of the close of the 19<sup>th</sup> and the beginning of the 20<sup>th</sup> century. Of course, this is also the period of Pupin’s life and his contribution to national questions, literature, and science, which, notably, drew on ‘tradition’. In contrast to his intellectual breadth and the complexity of his poetic, hierarchical symbolic system, it is science alone that arguably dictates the narrative of our present age: stories borrow scientific concepts, like that of evolution, and describe the world through or imitate the technological (arguably a product of science). Heidegger writes in “The Question Concerning Technology,”<sup>43</sup> that there is a need to promote *poieisis* as technology has gone so far as to regulate man’s highest dignity (*in die höchste Würde*).

The late 19<sup>th</sup> century gave voice to those who foresaw the negative consequences that would result from such strong leanings towards technology. The broad temporal and critical reach of these critics makes for strange bedfellows, as these examples show: Mumford, Tagore, Ruskin, Rilke, Arnold, and Velimirović.

Not only the breadth of cultural insight, but also the polymathy and cross-fertilization between culture, politics and science in the late 18<sup>th</sup> to 19<sup>th</sup> centuries, was made possible by the broad education of the day. It was a period conscious of the importance of education and a time of Rousseauian ideals, which led, among other things, to the birth of kindergarten and even the institutionalisation of the Boy Scouts. Kurt Hahn instituted Outward Bound; Montessori schools were opened; Medjimurje-born Austrian Rudolf Steiner articulated his approach to education in “Education in the Light of Spiritual Science” and established the Waldorf school; Ernest Fenell attempted to change the way art was taught in America; William Torrey Harris established America’s first permanent public kindergarten in 1873 and solidified the public school system (also attempting to make Hegelianism the official philosophy of the American school system); Tolstoy and Tagore

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<sup>43</sup> Martin Heidegger, “The Question Concerning Technology” (paper delivered in Bremen, December 1, 1949), accessed August 6, 2012, <http://www.english.hawaii.edu/criticalink/heidegger/guide1.html>.

formed their own schools; a generation of Frobel's students made kindergarten a worldwide phenomena.<sup>44</sup> Even Karl Orff could be said to be a later example of the ideals of the age—where singing, dancing, gardening and activities seeking to nurture “well-rounded” members of society. The educated class carried the torch of Classic, Renaissance and Humanist values in a more progressive way, in that the spirit of the age of education was to make it public. Ruskin and Arnold taught in the first ‘public’ colleges. Pupin himself wrote a lot about education, and aside from teaching at Columbia, he held popular lectures about science, spoke at university commencements, wrote newspaper articles on education, and expanded this theme in his autobiography. What is more, he had even made plans to renovate the school system in his hometown, Idvor, though these plans were sadly never executed, despite his having sent the appropriate funds and plans.<sup>45</sup>

Pupin was also influenced by other Victorian and Romantic ideals, some of which influenced his understanding of science, literature and nation building. The popular, professional culture of his age was quite literary, with narrative pieces filling the pages in newspapers and with what we would today refer to as ‘experts’ still writing books for the masses. Just one hundred years prior, Dickens had famously sought to popularise scientific discovery through the short story in *Household Words*. In Trilling’s account, in the 19<sup>th</sup> century, educated men of even non-literary professions were expected to possess literary skills in order to be able to communicate ideas effectively to the general public: “required to command literary abilities which would now be thought irrelevant. The man of original ideas spoke directly to the ‘intelligent public,’ to the lawyer, the doctor, the merchant, and even – and much more than now, as is suggested by the old practice of bringing out very cheap editions of important books – to the working masses. In the nineteenth century, in this country as in Europe, literature underlay every activity of mind. The scientist, the philosopher, the historian, the theologian, the economist, the social theorist, and even the politician, were required to command literary abilities which would now be thought irrelevant to their respective callings.”<sup>46</sup>

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<sup>44</sup> This kindergarten influenced Kandinsky and Klee. Norman Brosterman, *Inventing Kindergarten* (New York: Harry N. Adams, 1997).

<sup>45</sup> Dragoljub Živojinović, *Mihajlo Pupin: Nacionalni-politički rad 1908-1935* (Belgrade: Zavod za udzbenike i nastavna sredstva, 1998). See “Baštovanska industrija,” 159-180.

<sup>46</sup> Lionel Trilling, “The Function of the Little Magazine,” in *The Liberal Imagination* (New York: New York Review of Books, 2008), 95.

The interplay between the scientific and literary presents a stark contrast to the present age when the arts receive only minimal funding, and when one either is a scientist or a man of letters. Cross-pollination, or interculturalism, occurs most readily when what we call ‘the humanities’ flourish. In more recent times, it has been limited to within the realm of post-modernism, as testified by books with titles like *The Poetics of Space*<sup>47</sup> or *The Archaeology of Knowledge*,<sup>48</sup> though entry into the discourse requires specialization and the discourse is often only relevant within its respective field. The ideas of the Victorian age have been written off as hegemonic or imitative. The universal world view is claimed to be reductionist. The truly “liberated” intellectual, the promise of *artes liberales*, is to break up matter with a microscopic eye, instead of taking the agency and responsibility to synthesise given elements into a cohesive whole.

The modern scholar is more alike Pope’s “scholiasts” in *The Dunciad*, with their “microscope of wit”, unable to see the bigger picture, substituting a “mechanic Cause” for God, and making man the “final cause”<sup>49</sup>—which is rather suggestive of Whitman’s *Song of Myself*. These ideas will be expanded in this work, specifically as a counterpoint to Pupin’s social vision, in which every man is to work for the overall social well-being of society. The lack of metaphorical vision on the part of the main character of Pope’s poem, Cibber, is what threatens the demise of both art *and* science. Interestingly, in considering the image of the “microscope of wit” is that Eliot used the microscope as a metaphor herself, to illustrate the limits of a purely scientific view of the world. The point here is that metaphorical and poetic images that span across disciplines are critical to objectivity through the kind of comparisons that stimulate critical thought and illuminate ideas. Despite all of Pupin’s work in diplomacy, all that he worked for began to take another direction after his death, perhaps symbolized by the meeting Columbia permitted in the building dedicated to him, which his son-in-law felt was a trick to imply Pupin’s support for something he would have so disliked that he would have preferred for his name to be removed from the building.<sup>50</sup> The respect Pupin had for cultures in his Romantic view of

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<sup>47</sup> Gaston Bachelard, *The Poetics of Space* (Boston: Beacon Press, 1994).

<sup>48</sup> Michel Foucault, *The Archaeology of Knowledge* (Oxon: Routledge Classics, 2002).

<sup>49</sup> Alexander Pope, *The Dunciad, With Notes* (London: Lawton Gilliver, 1729), accessed December 12, 2012, <http://archive.org/stream/dunciadwithnote00gillgoog#page/n10/mode/2up>.

<sup>50</sup> Lewis Graham Smith, *The New York Times*, 18 December 1947; the issue became a scandal and merited a written response by Arnold Johnstone on 24 December 1947. Please note that where there was no byline for

the world ceased to in turn be respected by the global culture increasingly limited to power and violence, not for the first time in history and not unlike those under the goddess' sway in *The Dunciad*, who discouraged thought and encouraged those “who rhymed for hire, and patronized for pride”. The Yugoslavia Pupin envisioned was not opportunist but interculturalist, which is illustrated in the ideal of multicultural harmony in Yugoslavia. Given his cultural ideals, Pupin stands for the values of a bygone age in that he still believed that institutions were working for, not against, man—or, to use Arnold's terminology, when institutions were “Hellenistic”, not “mechanistic” or “Hebraic”.<sup>51</sup>

He addressed the problems of power through very specific instances in numerous newspaper articles, drawing attention to the dangers of the corporation that were later addressed so energetically by Horkheimer and Adorno,<sup>52</sup> though he did also praise those same enterprises—so long as they held ideals and operated fairly. While the development of media, the corporation, and science have developed rapidly since his day, he had foreseen the broader consequences of our approach to those areas of life. Thence the importance of his education in the classics: for him, it was not enough for science to be viewed on a purely material basis. In fact, he wrote that no profession is exempt from humanistic values. Thus, to him, as to many other scientists of his day, science was also ethical<sup>53</sup>, a point also addressed in George Orwell's “What is Science?” which explicitly links a humane scientific approach to a knowledge of culture, “history or literature or the

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newspaper articles, the article will be cited by headline, except in cases where the newspaper article had no headline – if, for example, it was a newspaper clipping, like this one, available in the Columbia University Rare Books Room, to be cited hereafter as C.U. Rare Books, M.S. 1035. A student organization letter by Albert C. Jacobs wrote to Barbara Pupin Smith that they believed the selection of Pupin Hall was deliberate and that the theory that democracy could not defend itself against those attacking it was “grotesque,” 5 February 1948, C.U. Rare Books, M.S. 1035. Pupin's son-in-law Smith also wrote about other contested issues, including a paper in which he states that unrest in Yugoslavia was caused not by natives but by Mussolini's agents; that Moslemization had been performed for political gain; that the Yugoslavia that was emerging was a filthy “slave state” 18 December 1947, *ibid*.

<sup>51</sup> Arnold writes, “The uppermost idea with Hellenism is to see things as they really are; the uppermost idea with Hebraism is conduct and obedience.” Arnold, *Culture*, 91.

<sup>52</sup> E.g. Theodor W. Adorno and Max Horkheimer, *Dialectic of Enlightenment* (Palo Alto: Stanford University Press, 2007), 120.

<sup>53</sup> Today, ethical concerns are not universally taught at universities and the Platonic and Aristotelian concept according to which all matter of life is arranged in one hierarchy with God at the top and precious materials and minerals at the bottom outlined in, Arthur O. Lovejoy, *The Great Chain of Being* (Cambridge, MA: Harvard University Press, 1936) is viewed as archaic; it is reworked where it appears in, George Lakoff and Mark Turner, *More than Cool Reason* (Chicago and London: University of Chicago Press, 1989), 166-9, 170-4, 204-5.



arts,” noting that those instilled with such were those who refused to do research on the atomic bomb, “well knowing what use would be made of it”.<sup>54</sup>

An understanding of God, at the apex of classical studies as revisited up to the mid-20<sup>th</sup> century,<sup>55</sup> is essential if one is to understand Pupin's writings, which are arranged around a love of humanity and a feeling for and understanding of God, thus there are real problems in making room for him in contemporary dialogue, where religion is reduced to the categories of zealotism, the irrational, the outmoded, the mechanical,<sup>56</sup> or Right-wing fundamentalist politics. But if we are to take Marx up on his claim that he wished to liberate mankind from the shackles of history, it will be more interesting for us to look for the similarities between Pupin and his contemporaries, than to be categorical and dismissive. An attempt will be made in this direction. If culturally relative views have taught us anything, it is that there is wisdom to be garnered in every context. However, it seems that man is seeking to liberate himself from history altogether, which can be interpreted as a form of rejection and thus a narrowing of contexts. It is posited here that Victorian and also Romantic thinkers are relevant, especially considering that some of them, including Pupin, anticipated some of the problems that we are facing today.

It is said that the classics are a cultural language—demonstrated thus far in the excerpt by Trilling and essay cited by Orwell, wherein the language is one of philosophy (which includes ethics) and of clarity in order to ensure it be made accessible to the public; it is a language insofar as it is a system that requires learning if it is to be understood. Pupin is fluent in that language, but he did more than master it, infusing it as he did with the folk wisdom he inherited from his mother and village. While it is said that the categories of high and low art are good for critics, but not for man, there are few such problems with Pupin who took a unique approach in how he approached tradition, difference, and meaning. His writings provide insight into a modern interpretation of the classical tradition via the bridges he built from it to the local, global, and scientific. It is believed that through

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<sup>54</sup> George Orwell, “What is Science?” *Tribune*, October 26, 1945, accessed August 6, 2012, [http://orwell.ru/library/articles/science/english/e\\_scien](http://orwell.ru/library/articles/science/english/e_scien).

<sup>55</sup> See fn. 53.

<sup>56</sup> “Mechanical” not only in Arnold’s understanding in *Culture and Anarchy*, but also as per Trilling. “Religion nowadays has the appearance of what the ideal modern house has been called, ‘a machine for living,’ and seemingly one makes up one’s mind to acquire and use it not with spiritual struggle but only with a growing sense of its practicality and convenience;” Trilling, *The Liberal Imagination*, 20.

addressing Pupin's narrative, in an attempt to reconstruct his views and understandings, our understanding of the present will be further edified. After all, a strong case has been made that "cultures directly sustained by storytelling, which now—significantly—implies the so-called 'primitive' cultures may alert us, through their narratives, to the parochialism of our supposedly 'universal' critical principles".<sup>57</sup> The question is whether Pupin's narrative contains elements to alert us to our own parochialisms.

### **1. 1. Introduction to Pupin's views on science, narration and nation**

In summarising Pupin's views with regards to these three 'fields', it is more difficult to consider them separately than to consider them as part of a cohesive whole. This is especially true given that science was only beginning to become specialized and Pupin himself was in many ways a product of the classical education system. What is more, however, it can be said that these fields were interconnected in Pupin's mind, according to his symbolic hierarchy, wherein he explicitly describes God as being at the top, with scientists, like saints, occupying steps on the ladder leading to that apex, as we shall see in later chapters. It will be argued that this hierarchy is primarily 'philological' in that Pupin's central ideas are connected to what can be described as poetic idealism, with the Word at its center.<sup>58</sup>

While this latter point is arguably problematic in today's academic discourse, justification for its highly abstract—and metaphorical—value can be found in the works of Lakoff, Turner, Johnson, Burke, and Ricoeur. This background will be dealt with in more detail below.

The term 'poetic idealism' has been chosen here for several reasons. Firstly, Pupin himself uses these words unsparingly in his autobiography and many of his other works as well. He values poetry above all, and calls scientists "poets", and "poetry" God's language; it is up to the scientist to decipher God's messages, which are distilled, like poetry,<sup>59</sup> and

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<sup>57</sup> Kroeber, *Retelling*, 2

<sup>58</sup> Lest that sound too theological, as already mentioned, we will be adopting Burke's philological project, *crede ut intelligas*. Burke, *Language*, 47.

<sup>59</sup> Pupin, *Immigrant*, 196, 65-70, 76, 102, 219, 222-3, 379.

are “the truth.”<sup>60</sup> While prose is also important, prose is “what something can do”, while poetry is “what it is”.<sup>61</sup> Poetry, then, symbolises the essence, and it is possible to speak of the essence of a story. In this way, Pupin describes “Tyndall's poetry in prose”; the “rhetoric” of coal;<sup>62</sup> or the material world's “eternal truth story”<sup>63</sup> wherein physical phenomena can be perceived through “poetic vision”.<sup>64</sup> As such, poetry allows for the depth of coherence in Pupin’s narrative.

Even the concept of nation is connected to this “poetic idealism”, though perhaps here, though characteristic of the values espoused by certain prominent Victorian writers, the idealism can also be called “Romantic”, wherein Romantic idealists, starting from Herder and Goethe, through Percy and Vico, saw a crucial defining element of the nation, or folk, in poetry and the poetic.<sup>65</sup> Herman Randall, who has written extensive overviews of thought, observes that, “Romantic idealism, in a word, is poetry, not science, and it is the poets who give it best expression.”<sup>66</sup> The connection between poetry and nation is made from the outset of Pupin’s autobiography,<sup>67</sup> and there is also a strong connection between nation and narration.<sup>68</sup> Pupin can further be described as romantic as per Randall’s definition, which values ideals over science: “behind the screen of mechanistic physics they saw the real world as at bottom a process of realizing ideals.”<sup>69</sup> These ideals can also be found in the works of Victorian polymaths like Arnold and Ruskin.

The idealism can be seen most prominently in Pupin’s adoption of American ideals (liberty, the American dream), which he then applies to his further articulation of Serbian

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<sup>60</sup> Pupin, *Immigrant*, 219, 220, 209-10, 194.

<sup>61</sup> *Ibid.*, pp. 76.

<sup>62</sup> *Ibid.*, pp. 65.

<sup>63</sup> *Ibid.*, pp. 194.

<sup>64</sup> *Ibid.*, pp. 222-3.

<sup>65</sup> Goethe and Percy collected the folk poetry of various lands, Herder and Vico argued that voice be given to the autonomy of peoples. This will be examined in further detail later.

<sup>66</sup> Randall, “Romance,” 18.

<sup>67</sup> Pupin, *Immigrant*, 8: “The Serb ballads recited by Baba Batikin glorified the great national hero”.

<sup>68</sup> *Ibid.*, 59, 169, 209, 212-4. Anecdotes are made out of cultural associations and dialogues based on such, for example, when he watches a Highland dance, he writes, “The bagpipes reminded me of my native Idvor, and made me feel at home in bonny Scotland before I had been much over a week in Arran”, and goes on to conclude, “One does not appreciate fully the wonderful qualities of the Scot until he tries to master the theory and the practice of the Highland fling or reel. Maxwell's electrical theory, I thought, might be just as different from other electrical theories as the Highland dances are different from the dances of other nations. I found out later that my guess was not very far from the truth,” *ibid.* 212-14.

<sup>69</sup> Randall, “Romance,” 17.

nationalism, in an example of interculturalism.<sup>70</sup> However, while his memories of Serbia are for all purposes idealised in his autobiography (the idyllic, bucolic memories, the folk traditions), passing the test of Romanticism wherein “the test of any institution or idea was no longer its reasonableness and its utility but its origin and history”<sup>71</sup>—his description of what it takes to be an American has a good deal more pragmatic (learn to “play the game,” he urges). However, this is arguably part of another idealistic leitmotif of the book, namely, that of education. One must study and be willing to learn if one is to reach one’s ideals: whether scientific, narrative, or national.

While he addressed the practical difficulties of teaching, both in terms of the problematic quality of students and in the example of teaching an unprepared audience, his ultimate argument, to which many passages throughout the book are dedicated, is that education is of key importance not only to a country, but also to the individual. The “whole ideal for man” of the Romanticists was, “the fullest development of the unique potentialities of every man. We have seen how Rousseau built his educational program about such an ideal.”<sup>72</sup> We have seen how this Romantic idea was applied in some of the Victorian educational systems and schools (in the examples of Steiner, Froebel, and so on).

These views are ‘ideal’ insofar as they seek to achieve the set of ‘poetic’ beliefs outlined above. Pupin stresses throughout the book that these are not ‘material’ goals, but ‘abstract’, and therefore noble, ones. It shall be pointed out that the words ideal, poetry and romantic share a common etymology. “Behind the screen of mechanistic physics [romanticists] saw the real world as at bottom a process of realizing idealism.”<sup>73</sup>

The three sub-themes of this work are connected in the author's own work, and works, and in this way, serve as an apology for the cross-referencing in the following chapters. However, before this introduction can be concluded, one more apology must be made, and that is for Pupin’s hierarchical, and also integral, symbolic system. At the top of this system is God, who speaks the poetic language of science, and grants freedom,

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<sup>70</sup> E.g. Pupin, *Immigrant*, 162-3. In a conversation with a Hungarian magnate on one of his returns to Idvor from the West, he rejects the magnate’s suggestion that Budapest serve as the metropolis of South Slavs in Hungary by appealing to one of the messages of the American Declaration of Independence, namely the divine right of the people, which he had lectured about in Karlovci, encouraging Serbs to wake up and deny the right of the Hapsburg crown.

<sup>71</sup> Randall, “Romance,” 21.

<sup>72</sup> *Ibid.*, 15.

<sup>73</sup> *Ibid.*, 17.

expressed through the nation. This symbolic system is problematic for the current conceptual linguistic field in which hierarchy is often claimed to be rightly outmoded or irrelevant. It is, however, close to Romanticism, which “in a word ... *is* religion”<sup>74</sup>, if based on Spinoza’s scientific religion, translated from Cartesian science into Romantic poetry. The shift in modern thought will be addressed in the coming chapters, for now however, the remaining aim of this introduction is to justify the system as it is.

Pupin’s poetic unifying system overlaps with frameworks posited by thinkers in the field of hermeneutics, cognitive linguistics, and modern rhetoric. The following theoretical support for his system should explain two things. The possibility (if not desirability) of a unifying symbolic system which operates from a linguistic and literary skeleton, and an argument for why such a system can point to God, or at the very least, a system of higher values. To not address this latter point is to turn a blind eye to the value system as it is presented in Pupin's autobiography.

### **1.2.1. Linguistic symbolic systems**

In this section, designed to provide only but a brief overview, man will be described as a symbol-using animal,<sup>75</sup> whose symbolic systems make and remake the world,<sup>76</sup> signifying an increase in being,<sup>77</sup> according to the terminological context he is using. As Pupin created a coherent world view, such symbolic order will be explained here: starting with symbolic hierarchies wherein certain symbols are more important than others. The symbols constitute key ideas, according to which a life can be structured. They are linguistic in that they are conveyed through words and they are poetic in that they are mostly conveyed through metaphors leading to ever higher levels of generalisation. As it is a conceptual system, there are places where the poetic overlaps with the narrated. Where stories make objects easier to handle, and can be described as the explanation of the poetic, they essentially both serve the same symbolic hierarchy. As these symbols cannot be perceived without education or experience, narrative becomes an important guide for such growth.

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<sup>74</sup> Randall, “Romance,” 19.

<sup>75</sup> Burke, *Language*, 3-9, 28.

<sup>76</sup> Paul Ricoeur, “The Function of Fiction in Reshaping Reality,” in *Reader*, 129

<sup>77</sup> Hans-Georg Gadamer, *The Relevance of the Beautiful* (Cambridge: Cambridge University Press, 2002), 35.

As symbols may represent ideas, according to which a life can be structured, their function is connected to mimesis which is of twofold relevance to this work, as it refers to the star dance of the heavens,<sup>78</sup> and we shall see that there is a stellar motif to Pupin's autobiography. For now we might say that Pupin's use of the narrative form to popularise his (scientific) symbolic system may be compared to the stars' representing the pure mathematical regularities and proportions that constitute the heavenly order. Mimesis, in terms of the Aristotelian model, is concerned with the improvement of human action, and there is direct employment of it in Pupin's autobiographical details, such as in his self-awareness and good work ethic. However, even in those instances, the mimetic is connected up to a larger set of values<sup>79</sup> such as American and Serbian patriotism, the American dream, and the ideals of science, ultimately to search for a universal language: God's language, not materialism. In this respect, the book reaches almost epic proportions, wherein the individuals described are only as important as the ideals they stand for. Scientists and nationalists are lauded as saints and champions. Though the narrative breaks off from the mimetic into abstraction within the realm of science, it maintains its symbolic, poetic value throughout, and reaches the iconic augmentation Ricoeur describes, with the goal to teach that which is essential: the 'imitation copy' is at a higher degree of subtlety than human action having been undmade and remade, intensified by being above practical temporality, oversignified, which is possible because human action "is already pre-signified by all the modalities of its symbolic articulation".<sup>80</sup> The section of the book dealing more with science than with Pupin's life was left out of many of the editions sold to schools and libraries – showing that it was precisely the abundantly transformative narrative that appealed to the audience and was considered the strong point of the book.

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<sup>78</sup> Gadamer, "Relevance," 36.

<sup>79</sup> Here, we are using Gadamer's expanded definition of mimesis. "The concept of mimesis that expresses such 'aesthetic' experience does not have to be artificially referred back to the original Greek situation in which all the arts were still closely related to one another... The mimetic is and remains a primordial phenomenon in which it is not so much an imitation that occurs as a transformation ... Mimesis then does not imply a reference to an original as something other than itself, but means that something meaningful is there as itself ... In this sense, the nature of all productive activity in art and poetry still lies in the fundamental mimetic experience;" *ibid.*, 121-2. He also writes that mimesis, "implies that something is represented in such a way that it is actually present in sensuous abundance," *Ibid.*, 36.

<sup>80</sup> Ricoeur, "Mimesis and Representation" in *Reader*, 150, 149.

### 1.2.1.1. Man as a symbol-using animal

Burke's work *Language as Symbolic Action* considers man as a symbol-using animal,<sup>81</sup> wherein nature is emblematic of spirit 'imposed' on it by means of linguistic genius.<sup>82</sup> Ricoeur also writes of an almost intuitive function of language: "By means of the referential function, language 'pours back into the universe' those signs which the symbolic function at its birth divorced from all things."<sup>83</sup>

In other words, "we typically conceptualise the non-physical in terms of the physical – that is, we conceptualise the less clearly delineated in terms of the more clearly delineated."<sup>84</sup> The signs and symbols must be based on something already previously known, though, as we will see, there can be signifying words like 'idealism' which seem to float amongst a system of equally abstract, and non-physical signs, like 'non materialistic' or 'progress'. Burke writes that while man's physical component cannot explain all aspects of his existence, his symbolicity can only be expressed through the terms of his animality: "In defining man as the symbol-using animal, we thereby set the conditions for asking: which motives derive from man's animality, which from his symbolicity, and which from the two? Physicality is, of course, subsumed in animality. And though the *principles* of symbolism are not reducible to sheerly physical terms (quite as the rules of the football are not so reducible despite the physicality of the players' hulks and motions as such), the meaning cannot be conceived by empirical organisms except by the aid of a sheerly physical dimension."<sup>85</sup>

This is to say that signs and symbols emerge on their most elementary level through the physical, and by default, through physical observation. It will be noted that Pupin's poetry stems, as all poetry does, in the material and physical, and connects to the abstract and ultimately eternal and divine. It should also be noted that because of the signs and symbols potentially at play within any written work, a novel and a scientific treatise, for example, do not have to be considered as diametrically opposed texts. Both seek meaning.

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<sup>81</sup> Kenneth Burke, *Language as Symbolic Action: Essays on Life, Literature and Method* (Berkeley: University of California Press, 1996), 48.

<sup>82</sup> Ibid., 362.

<sup>83</sup> Ricoeur, *Reader*, 46.

<sup>84</sup> George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980), 59.

<sup>85</sup> Burke, *Language*, 7.

The problem, as Burke has pointed out, is whether these systems seek perfection or conflict and victimage.<sup>86</sup> Some terministic screens may leave out that which is essential.<sup>87</sup> In Pupin's scheme of things, both science and narrative seek the betterment of mankind.

#### **1.2.1.2. Meaning as the result of a terminological context**

There is almost always a terminological and temporal context to what is written. Scientific concerns are not static, premises change and related methodology is prescribed. For example, assumptions of what science ought to achieve or is capable of has changed through time. The word scientist itself is a product of history, having been invented by William Whewell to unite in a single word the increasingly specialised branches of science (scientist being analogous to artist). And although the word is mainstream today, its use was contested in *Nature* magazine right up until the 1920's; what is more, it was first used in the United States from the 1870's to refer to those pursuing pure science as opposed to that conducted for material gain.

It is important to understand the terminological context of Pupin's work. In the 19<sup>th</sup> century, an age influenced by both Victorianism and Romanticism, cross-fertilisation meant that fictional stories were published in periodicals to popularise scientific knowledge. In the United States during Pupin's time, one such periodical was *Scribner's*—where his autobiography was initially published as installments. In popular culture, alongside the strains of art and science, were notions of national freedom. It was a time of the birth of the American dream, and a time of nation building in Europe. Both the bounds of science and national liberty burned from the pens of Romantic writers. The terminological context was one of Romantic ideals.

The decision of whether to deal with man scientifically, philosophically, or belletristically predetermines the answer that will be arrived at. Understanding is relative to the point of departure. Our conceptual system determines our reading of the world, just as Pupin's determined his poetic view of the world. Burke calls these points of departures, or conceptual systems, "terministic screens": "A definition of man must be a general

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<sup>86</sup> Burke, *Language*, 54-5.

<sup>87</sup> *Ibid.*, 46.



‘philosophic’ problem rather than a specifically ‘scientific’ one. Each specific science could not be its characteristic self except insofar as it abided by its particular terminology and each such terminology is designed for a specific nature of observations rather than for meditations on the nature of man in general.”<sup>88</sup>

It is argued that to draw on classical thought, as does Pupin, requires of thought some work in ontology and consideration that “meditations on the nature of man in general” may be as philosophic as scientific. Study of classical thinkers like Aristotle and Plato teaches students that questions are the beginning of wisdom, and that clear, truthful thinking is to be developed; one is not to be a mere imitator of realities like an entertainer, basing knowledge on opinions akin to hydra-like heads.<sup>89</sup>

Drawing from this framework, and perhaps keeping in mind Aristotle’s *Organon*,<sup>90</sup> which begins with a work called *Categories* that classifies that which exists beginning with words and parts of speech and including substance, action, and passion, we can say that categorical distinctions are to be used with the awareness that they may contribute to the obfuscation of a being, an action, or a thing. The question to be asked is whether one seeks an answer by imposing terms; whether one’s terministic screens ignore the central questions of how and why, “around whence and to what end they eternally circle. They seek to grasp nothing in and for itself, but only in special aspects; and therefore, not as a whole, but only piece-meal.”<sup>91</sup> It is thus argued that the terministic screen in a humanities paper, like this one that references the classical thought found in Pupin’s autobiography, ought to be concerned with all sides of our humanity and all parts of society, as Arnold counsels, arguing that we ought to be particularly mindful of that which is vital, and wary of the “mechanical.” It can be seen in Plato’s *Euthydemus* and *The Sophist* that eristic questioning (a form of arguing that has for its goal successful disputation as opposed to

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<sup>88</sup> Burke, *Language*, 63.

<sup>89</sup> See Aristotle’s *Metaphysics* 4.7 and *Categories* 5.4 in *Aristotle Organon and Other Works*, ed. W.D. Ross, accessed August 5, 2012, <https://archive.org/details/AristotleOrganon>; Plato’s *Sophist* (235, 240) as well as *Euthydemus* in which the hydra is described as, “that she-professor who was so clever that she sent forth many heads of debate in place of each one that was cut off” trans. W.R.M. Lamb (Cambridge: Harvard University Press, 1967), accessed September 2, 2012, <http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0178%3Atext%3DEuthydemus%3Apage%3D297>, 297.

<sup>90</sup> Aristotle, *Organon*.

<sup>91</sup> Friedrich Schleiermacher, *On Religion: Speeches to Its Cultured Despisers* (London: K. Paul, Trench, Tribner & Co., Ltd., 1893), 71.

truth) is almost mechanical in that it requires no giving over of oneself to the subject but is merely a manipulation of the subject even if this makes of it nonsense. By contrast to eristic questioning is the holistic approach to truth in the written dialogues of Plato, “that great master of ... the thinking dialogue of science, with its ... earnest spirit of investigation ... not less exquisite in the finish of the several parts and divisions, that the poetical production of the greatest and most admired dramatists.”<sup>92</sup> Burke writes that, “Any poetic attitude has a kind of summarising wholeness that is technically alien to specialised terminologies of our essentially tech-tinged science.”<sup>93</sup>

Pupin's terministic screens were broad. His life quest begins with the questions: *What is light? What is electricity?*, and when he writes about science, he does so poetically. This is no small point, for in establishing such a lofty orientation for his scientific understanding, Pupin has responded to Ruskin's criticism of science: “We all assume that science has done its utmost, and that every chemical or animal force is demonstrably resolvable into heat or motion ... I myself would like better ... to consider motion as a mode of heat than heat as a mode of motion; still ... we have yet to ask, what is heat? Or, what is motion? What is this ‘primo mobile’ ... in which all things live, and move, and have their being?”<sup>94</sup> It is interesting to note that Maxwell asked these same questions as a child: “What's the go o that? What does it do?”<sup>95</sup> Inquiring minds wish to penetrate the heart of the matter.

Though there are places in Pupin's autobiography where he loses touch with the concrete and the relatable component in the metaphoric, such as in the lengthy scientific discourse, there is an overarching unity and depth of meaning that can be applied, to useful effect, in everyone's lives. This will be addressed in the reviews in the next chapter. Like a successful metaphor, good observations of the nature of man are those in which the place, time, and even subject, are interchangeable.<sup>96</sup>

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<sup>92</sup> Friedrich Schlegel, *The Philosophy of Life and Philosophy of Language*, translated by A.J.W. Morrison (London: Bell and Daldy, 1860), accessed July 19, 2012, [https://archive.org/stream/philosophyoflife00schl/philosophyoflife00schl\\_djvu.txt](https://archive.org/stream/philosophyoflife00schl/philosophyoflife00schl_djvu.txt), 352.

<sup>93</sup> Burke, *Language*, 58.

<sup>94</sup> *Ibid.*, 86.

<sup>95</sup> Lewis Campbell, *The Life of James Clerk Maxwell*, (London: Macmillan and Co., 1882), accessed October 1, 2010, <http://archive.org/details/lifeofjamesclerk00campuoft12>.

<sup>96</sup> See Gadamer, *Relevance*, 53.

It is being argued here that the meaning a writer creates ought to be, as Arnold proposed, universally applicable. Such a view necessarily challenges the validity of the latter chapters in Pupin's autobiography that were more specialized. This also highlights the power struggle inherent in scientific narrative, which threatens to encroach on all other themes: the zeal of this worldview was already apparent at the turn of the 20<sup>th</sup> century. Randall explains the tendency by suggesting that the scientific method became as entrenched in men's minds as it did because of an overlap between Romanticism and science and what science adopted from Romanticism.<sup>97</sup> The resulting predominance of the scientific claim over truth is problematic. Lakoff and Johnson write: "Being objective is always relative to a conceptual system and a set of cultural values. Reasonable objectivity may be impossible when there are conflicting conceptual systems or conflicting cultural values. [Therefore] giving up the claim to absolute truth could make science practice more responsible, since there would be a general awareness that a scientific theory may hide as much as it highlights."<sup>98</sup>

It will be suggested in a later chapter that an objective, universal truth about science may indeed hide as much as it reveals. Pupin himself writes of the veil of nature, as we shall see. Burke explores the problem of objectivity, a means by which nature is understood, when he writes "We *must* use terministic screens, since we can't say anything without the use of terms; whatever terms we use, they necessarily constitute a corresponding kind of screen; and any such screen necessarily directs the attention to one field rather than another."<sup>99</sup> This is, perhaps, another way of putting Gadamer's point about the *Parmenides*—that the truth is mixed in with many possible opinions. It certainly underscores the point that the classical 'methodus' was not to objectify or dominate, but participate in association with the things with which we are dealing. In this respect, the possibility of there being a neutral standpoint was not assumed.<sup>100</sup>

If, as Randall suggests, belief in the scientific method (which hides and reveals) is greater than any final scientific knowledge, this means that the final conclusions have yet to be drawn, and, as Gadamer shows, there is (as there always has been) an opportunity for

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<sup>97</sup> Randall, "Early 20<sup>th</sup>".

<sup>98</sup> Lakoff and Johnson, *Metaphors*, 227.

<sup>99</sup> Burke, *Language*, 50.

<sup>100</sup> Gadamer, *Beginning*, 32.

other beginnings—through our participation—moving along with our changing goals. “Symbolic systems ‘make’ and ‘remake’ the world and ... our aesthetical grouping of the world is a militant understanding that reorganises the world in terms of works and works in terms of the world.”<sup>101</sup>

What is relevant to our discussion here is that Pupin was clearly working towards a coherent, completed system of meaning in his autobiography in which he sought to attain classical ideals such as ‘truth’. And such are the ideals that constituted the literature of the canon, made up of works that are arguably scientific, and most certainly philosophical, cultural, historical, geographical, and so forth. Characteristic of classical literature are grand, liminal themes such as love, death, truth, and ideals above all.

### **1.2.1.3. Symbolic, metaphorical orientation**

So far, this chapter has outlined the possibility of a unified system of thought, uniting science and nation through language: seeing “all parts”, a “summarizing wholeness”, and beyond the confines of “the microscope of wit”. The purpose of this section is to show that the symbols that make up such a system do not all have equal value, and that the classical symbolic system obeys a hierarchy to effectively inform decisions and evaluations that would lead to the Good Life. To understand this, one need only think of the child instructed in ‘model behaviour’. An example from Pupin’s autobiography is the story of how he overcame adversity and reached universal truths through hard work and observing ‘universal’ values. Another illustration from his work is the example set by saintly scientists whose work points to the eternal truth.

That symbolic elements are selected and combined implies that there must be a hierarchy, but this hierarchy is not necessarily the same for everyone. “The same actions that may be put into ‘records’ ... may also be explained in different ways according to the plurivocity of the argument applied to their motivational background.”<sup>102</sup> Opinions are many.

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<sup>101</sup> Ricoeur, *Reader*, 177.

<sup>102</sup> Paul Ricoeur, *From Text to Action: Essays in Hermeneutics II* (Evanston: Northwestern University Press, 1991), 161.

“Individuals, like groups, vary in their priorities and in the ways they define what is good or virtuous to them. In this sense, they are subgroups of one. Relative to what is important for them, their individual value systems are coherent with the majority orientational metaphor of the mainstream culture.”<sup>103</sup> The orientational metaphor is hierarchical because it is based on values: no matter what a person believes in, there is always bad and worse, or better and good.

The way the orientational metaphor works can be explained in several ways, but its main feature is that it moves between the experiential and the literary on a symbolic level. First, it can be described in terms of the hermeneutical arc, wherein a reader gleans information from a book, then applies it to his or her interpretation of life or actions. In this way, Pupin first read about the concept that science was poetry and subsequently applied it to his life, seeing the achievements of science in terms of their symbolism, as we shall see. If one understands the nature of the metaphor, it should be clear how a similar comparison can be made between the conceptual metaphor and lived experience. “The notion of the text is a good *paradigm* for human action and action is a good *referent* for an entire category of texts”.<sup>104</sup> Or, as expounded in Plato's *Gorgias*, many arts have their origin in experience because experience makes the days of men proceed according to art and inexperience—according to chance. Along with experience is the art of knowing how to apply it. Thus we may proceed to an underlying tenet of the symbolic hierarchy: the good life is open to a person “who can *read*”.<sup>105</sup> “We can only see nature with eyes of men educated and experienced.”<sup>106</sup> The definition of the word ‘art’, the etymology of which bears the meaning ‘put together, join, fit,’—all words fertile with metaphoric connotation, means skill as the result of knowledge or practice.

Applying such methodology to Pupin's autobiography is arguably valid in that he explicitly demonstrates these principles in his descriptions of cultural acclimatisation, education, and knowledge of science. For example, he is permitted entry to America for having recognized in American literature and figures features of the good life, like the leitmotif of autodidacticism, which he cultivates in himself: spending his free time reading

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<sup>103</sup> Lakoff and Johnson, *Metaphors*, 24.

<sup>104</sup> Ricoeur, *From Text*, 137.

<sup>105</sup> *Ibid.*, 155. Emphasis added.

<sup>106</sup> Gadamer, *Relevance*, 70.

about science in the public library. It is of no small importance that many of the reviews referring to classroom use of his autobiography emphasised how conveniently the book lent itself as a model for behaviour.

The orientational metaphor can also work through mimesis, for the message of art (or art as merely an interesting copy of life) is not its final goal; rather, it is the effects it creates, and the action it inspires. Aristotle suggests that through the purgation of the emotions by watching a tragedy, the process of mimesis ends in the audience or reader. “Generalising beyond Aristotle, I shall say that mimesis marks the intersection of the world of the text and the world of the hearer or reader... it is the intersection of the world unfolded by fiction and the world wherein actual action unfolds”<sup>107</sup> While mimesis is an action about an action,<sup>108</sup> its goal is to create action. Rather than being a vicious cycle, the movement between life, text and the reader/hearer is to promote growth within the person on the receiving end. “We may be tempted to look at the ‘teaching of the universal’ as a description of what human action already essentially is. We then come back to the ‘imitation copy’ at a higher degree of subtlty. It is no longer what is accidental to action that is re-presented or made present anew but what is essential.”<sup>109</sup>

There is a back and forth flow between the literary and experiential; this is a political flow, and one that is hierarchical. Kristeva agrees that, “The text is a practice that could be compared to political revolution: the one brings about in the subject what the other introduces in society.”<sup>110</sup> Thus, what is essential is that, “We must stop seeing the text as its own interior and life as exterior to it. Instead we must accompany that structuring opinion that begins in life, is invested in the text, then returns to life.”<sup>111</sup> Burke writes of a “dramatism” wherein language and thought are considered not just a means of conveying information but as modes of action.<sup>112</sup>

Thirdly, the orientational metaphor can also function through what Lakoff, Turner and Johnson have described as imaginative mapping: maps are made in the mind between experience and idea, and idea and idea. Or through what Ricoeur writes of

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<sup>107</sup> Ricoeur, *Reader*, 148.

<sup>108</sup> *Ibid.*, 150.

<sup>109</sup> *Ibid.*, 150.

<sup>110</sup> Julia Kristeva, *The Portable Kristeva*, ed. Kelly Oliver (New York: Columbia University Press, 1997), 30.

<sup>111</sup> Ricoeur, *Reader*, 151.

<sup>112</sup> Burke, *Language*, 54.

“schematization” wherein narrative fiction interposes its schematization of human action onto a map of action.<sup>113</sup> Mapping takes place both on the level of the sentence (in metaphors) and in entire narrative structures. The key domain, in which this mapping takes place, is in the imagination, the birth ground of the metaphor.<sup>114</sup> Metaphors themselves are overall conceptual mappings, “They are a matter of thought, not merely language.”<sup>115</sup> We can get a grasp on abstract ideas (as well as emotions)<sup>116</sup> through connecting them to lower, more concrete, familiar ideas, as is explained in the great chain of being. In the creation of the metaphor, “higher” or “top level” (metaphysical) elements are unified with the lower ones. This does not lower the level of the objects in the metaphor, but expands any of the lower level referents. Poetic language imitates life to augment it, and makes the higher ones more concrete, tangible, intelligible, to help us reach the stars, so to speak. This has been set out here to explain the stellar metaphor that forms a central theme in Pupin’s autobiography.

Mimesis, as Gadamer reminds us, referred to the star dance of the heavens: representing the pure mathematical regulations and proportions constituted in the heavenly order:<sup>117</sup> the implication being that it was the job of art to imitate this order. In Gadamer’s words, “Anyone who proclaims the message in a senseless way, that is, in a literal way that is unrelated to a concrete context so that it receives a false interpretation in a given situation, is not really proclaiming it at all.”<sup>118</sup> That is far lighter criticism than Burke’s assessment of falsities, which he sees as sources of conflict and victimage.

#### **1.2.1.4. Symbols: genuine and false**

The hierarchy that establishes order and distinguishes the good from the bad relies on metaphorical augmentation, for it is precisely the failure to reshape reality that language fails. The way to test poetic language is to see whether it ‘rings true’: clarifies or brings new perspective to life. Gadamer writes that bad poetry jars because it is stale and

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<sup>113</sup> Ricoeur, *From Text*, 176.

<sup>114</sup> *Ibid.*, 176-7.

<sup>115</sup> Lakoff and Turner, *More Than*, 107.

<sup>116</sup> Lakoff and Johnson, *Metaphors*, 115.

<sup>117</sup> Gadamer, *Relevance*, 36.

<sup>118</sup> *Ibid.*, 148.

conventional.<sup>119</sup> Through an “inferior” use of poetic language, “the word breaks” because of the “empty formulae of thinking that does not touch on the matter of thought.”<sup>120</sup> This is alike Cibber in Pope’s *Dunciad*, whose simple regurgitation requires no creativity, resulting in work so dull, not even dunces can appreciate it, and all fall asleep when it is read to them. Arnold explains that curiosity is what is needed: “a curiosity about their best self, with a bent for seeing things as they are, for disentangling themselves from machinery.”<sup>121</sup> As opposed to this, good poetic language (or, a “genuine poem”) “always furnishes the fundamental articulations that guide our understanding of the world.”<sup>122</sup> It gives us a mirror, which, through its special use of language, “gives all of us access to a world in which certain special forms of human experience arise.”<sup>123</sup> Gadamer goes on to explain that “A genuine text... is exactly what the word literally says: a woven texture that holds together.”<sup>124</sup> Or, the best texts are those that “truly” (in the Gadamerian sense) guide us. This sets the context for Pupin’s autobiography, which seeks to make a constructive, edifying order out of chaos. According to Gadamer’s reading, the Greek tradition, which he cites mostly for its use of “poetic language” of the kind being discussed here, sets up the transcendental qualities of the metaphor in the same way. Moving from a same/different dichotomy most exemplified in Gadamer’s writing by uniting the true and false, poetic language announces higher things while enjoying the freedom of play.<sup>125</sup> Ideally, a good text gives a sign. The sign is at the top of the symbolic scheme, as it is the most potent of symbols, and infuses symbols lower on the chain with meaning, what Lakoff and Johnson refer to as “iconic augmentation,” which will be explained further below.

#### 1.2.1.5. Symbolic hierarchy

To begin with, though, there is a saying of Heraclitus often mentioned by Gadamer that illuminates the matter of the sign very well: “The Delphic god neither reveals nor conceals,

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<sup>119</sup> Gadamer, *Relevance*, 114.

<sup>120</sup> *Ibid.*, 139.

<sup>121</sup> Arnold, *Culture*, 69.

<sup>122</sup> Gadamer, *Relevance*, 114.

<sup>123</sup> *Ibid.*, 115.

<sup>124</sup> *Ibid.*, 142.

<sup>125</sup> *Ibid.*, 143.



but gives a sign.” One needs only to understand what “giving a sign” means here: what is shown is only accessible to the one who looks for himself and actually sees something there so it differs from other people’s reports and silence.<sup>126</sup> It is the highest level of iconic augmentation, described by Ricoeur as representative of essence, because it combines meaning and being,<sup>127</sup> which transcend singular fields that Burke describes as being overcome by poetic works: “No matter how limited a poetic production may be, it is *not* reducible to terms of physics, economics, politics, and so on. Nor can it even be adequately described as a combination of the lot. And though any specialised nomenclature may throw light upon the work, there is an obvious sense in which the work necessarily contains elements not only beyond the limits of *each* separately but also beyond the aggregate of them *all*.”<sup>128</sup>

It is poetic language that is the vessel of the sign, poetic language that can work towards iconic augmentation; it is through poetic language that similarities—even across disciplines—can be perceived. “The dynamics of thought which breaks through previous categorization is the same as the one which generated all classifications.”<sup>129</sup> This explains why poetic language is at the top of the hierarchical scale, and also seems to expand the limitations of terministic screens. This concept is central to an understanding of Pupin’s narrative, which, as we shall see, interestingly builds iconic augmentation through the image of an actual icon, the significance of which is explained to him by his mother and which he poetically applies as a way by which to understand the ultimately divine meaning behind the works of scientists.

“By considering all knowledge as bounded by perception, whose operations may be indefinitely combined, we arrive at a conception of Nature inexpressibly more magnificent, simple and true, than accords with the ordinary systems of complicated and partial consideration.”<sup>130</sup> By perceiving new connections between things in the world around us, the mind is awakened and enlarged – becoming the receptacle of a thousand unapprehended

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<sup>126</sup> Gadamer, *Relevance*, 69.

<sup>127</sup> *Ibid.*, 81.

<sup>128</sup> Burke, *Language*, 57.

<sup>129</sup> Ricoeur, *Reader*, 81.

<sup>130</sup> Percy Bysshe Shelley, *A Defense of Poetry and Other Essays* (Philadelphia: Lea and Blanchard, 1840), accessed August 6, 2012, 2011, <http://www.gutenberg.org/ebooks/5428>.

combinations of thought:<sup>131</sup> and as such revealing that creativity is at the basis of all thought and knowledge<sup>132</sup>—again, at the basis of semantic origins.

The metaphor functions as an icon that alludes meaning. As we suspend signification in the element of fiction where anything is possible and perception and action are suspended,<sup>133</sup> the icon recreates reality at a higher level of realism, and can thus be termed as iconic augmentation. Higher, because it can reshape action and change perception. Thus, Pupin's mother's explanation of the icons that are scientists changes his approach to his profession and what he seeks from it. "What is changed by poetic language is our way of dwelling in the world."<sup>134</sup> Thus metaphor doesn't only change the structure of language, but also reality.<sup>135</sup> Lakoff and Turner explain that poetic discourse changes our way of conceiving the world.<sup>136</sup> And hence the unifying, symbolic system in Pupin's autobiography: science, nation and narration is to change our way of being in the world, to augment and improve it.

Aristotle's statement that the man who can create metaphors is a master: he has regained control over things, ordering them within his domain, just as things were ordered at the beginning of time. "Was it not Aristotle who said that 'to have command of metaphor is to have an eye for similarities'?"<sup>137</sup> According to Kristeva, poetic language is an attempt to master language by language.<sup>138</sup> Ruskin writes that to have mastered a craft is to create eternally true and wise meaning.<sup>139</sup> It is not accidental that the central theme to Pupin's autobiography is a poetic understanding of science and life, for he makes it explicit that one of his ideals for mankind is the mastery of chaos; through a poetic mastery of the language of God, mankind can seek the beneficial currents of life, he writes—as, of course, we shall see in more detail.

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<sup>131</sup> Shelley, *Defense*, 35.

<sup>132</sup> *Ibid.*, 45.

<sup>133</sup> Ricoeur, *From Text*, 174.

<sup>134</sup> Ricoeur, *Reader*, 85.

<sup>135</sup> *Ibid.*

<sup>136</sup> Lakoff and Turner, *More Than*, 215.

<sup>137</sup> Ricoeur, *Reader*, 78.

<sup>138</sup> Kristeva, *Portable*, 113.

<sup>139</sup> John Ruskin, *The Queen of the Air* (New York: Maynard, Merrill & Co. Publishers, 1892), accessed December 25, 2012, <http://archive.org/stream/queenairbeingas00nortgoog#page/n10/mode/2up,,> 226-9.

As it cannot be learned from others, the person who creates metaphors must possess an inner awareness of hidden resemblances:<sup>140</sup> the eye belongs to the individual; it is an individual choice whether to restore order or not. The goal of the imagination is to restore sight, with one line of vision, not double, triple, fractured vision. “Likeness is itself a compound relation which correlates sameness and difference. To see sameness in the difference is the genius of metaphor.”<sup>141</sup> Pupin did create a unifying system in his work—Christian and modern in its hope in progress, yet classical in terms of its higher levels of generalization leading to progress towards the Divine: all leading to one ideal.<sup>142</sup>

All metaphors that lead to a single as opposed to a multiplicity of understandings find a place in the scheme of the great chain of being, which is hierarchical in nature. As this work will seek to articulate some of the counterpoints to Pupin’s thought, it will also examine possible examples of the hierarchy gone wrong. Lakoff and Johnson warn that we have to be careful of which metaphors we accept to shape our reality, because while the great chain of being is a universal ordering process, it can be abused as much as it is used. Truth is relative to our conceptual system.<sup>143</sup> As being objective is relative to our conceptual system and set of cultural values, reasonable objectivity is sometimes impossible if these values are at odds.<sup>144</sup>

It is the power inherent in the metaphoric process that can trick many into the validity of metaphors that have a different aim. “For the same reasons that schemas and metaphors give us powers to conceptualise and reason, so they have power over us. Anything that we rely on constantly, unconsciously and automatically is so much a part of us that it cannot be easily resisted, in large measure because it is barely even noticed.”<sup>145</sup> This is why Burke finds it useful to use the Biblical phrase *crede, ut intelligas* as a paradigm for understanding how we approach metaphors—it highlights the fact that our understanding is predetermined by the conceptual frame of what we are searching for. We shall borrow this phrase later on to understand the implications of the adoption of myths; an examination of Pupin’s autobiography raises the question of how much and what in life is

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<sup>140</sup> Ricoeur, *Reader*, 80.

<sup>141</sup> Ibid.

<sup>142</sup> Like that in Platonic dialogue. See Burke, *Language*, 46.

<sup>143</sup> Lakoff and Johnson, *Metaphors*, 193.

<sup>144</sup> Ibid., 227.

<sup>145</sup> Lakoff and Turner, *More Than*, 63.

actually a leap of faith. Burke borrows a term from a theological practice, logology, “words about God” to study words about words, in order to stress the element of ‘faith’ in ‘understanding’: “The ‘logological’ or ‘terministic’ counterpart of ‘Believe’ in the formula would be: ‘Pick some particular nomenclature, some one terministic screen’. And for ‘That you may understand’ the counterpart would be: ‘That you may proceed to track down the kinds of observation implicit in the terminology you have chosen whether your choice of terms was deliberate or spontaneous’”.<sup>146</sup>

The return to *crede, ut intelligas* thus gains a new sense in that the belief that goes in to reading is actually the acceptance of a promise that one expects to be fulfilled. Pupin writes, “Sound and light became thus associated in my early modes of thought with the divine method of speech and communication, and this belief was strengthened by my mother, who quoted the words of St. John: ‘In the beginning was the Word, and the Word was with God, and the Word was God.’”<sup>147</sup> This is the highest level of reading because one is no longer reading text for text (to borrow the phrase word for word). One is seeing between the texts to perceive the message. The iconic augmentation is revealed to the initiate through Kantian “intuition”. Randall has shown, as Burke, the reductionist implications this “faith understanding” has even for science: in “Early 20<sup>th</sup> Century Currents of Thought” he writes of the idea of evolution which has come to stand as a symbol for the scientific faith with a fundamental dogma of “mechanical determinism”.<sup>148</sup> A “mechanistic analysis” explains complex phenomena by isolating simpler elements and processes whose behavior can be mathematically formulated and predicted.<sup>149</sup> Which is more limited than Burke’s expectations of poetic language: not reducible to terms of economics, physics, and so on.

From the order and unity of the Aristotelian model and the chaos and randomness of the Epicurean one, there are various systems according to which man seeks to make meaning of the world. The symbolic system adopted by Pupin demonstrates belief in order and unity; in this way, its features are more characteristic of poetic scope than scientific mechanization.

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<sup>146</sup> Burke, *Language*, 47.

<sup>147</sup> Pupin, *Immigrant*, 18.

<sup>148</sup> Randall, “Early 20<sup>th</sup>,” 342.

<sup>149</sup> *Ibid.*, 348.

### 1.2.1.6. The politics of a symbolic hierarchy

Thus far, it has been illustrated how man may create meaning in the world, or confuse it, through the application of different symbolic systems. These systems are very often political. Work by Lakoff and Johnson has shown that any hierarchy—even an aesthetic or linguistic one—has political undertones.<sup>150</sup> A claim could be made that the most deeply political is not overtly so. This is an underlying tenet in Arnold's *Culture and Anarchy*, wherein the notion of “sweetness and light” is considered through the symbolic class categories of philistines, barbarians, and the populace to show their respective materialism, vulgarity, and ignorance was keeping them from their best selves, hindering “the unchecked predominance of that class-life which is the affirmation of our ordinary self, and seasonably [disconcerting] mankind in their worship of machinery”.<sup>151</sup> Pupin's hierarchy will be shown to be a similar bid to see beyond the material aspect of life towards man's best self. Lest that idea sound not-literary, it may be pointed out that Ricoeur has shown how a political issue such as class struggle can be framed in terms of a *linguistic* hierarchy: “Thus, we are compelled to speak even of class struggle in terms of communication. Class struggle involves not only conflicting forces but a disruption of a process of communication between human beings. People become strangers in different classes. People do not speak the same language. Excommunication extends even to the level of style, grammar, amplitude of the lexicon, and so on [the difference is not only between the language tools they use but the symbolic systems through which they look at each other.]”<sup>152</sup>

Communication is a power struggle: it is a battlefield of definitions.<sup>153</sup> So the stakes are then raised on the ultimate meaning of those scientific systems which omit God<sup>154</sup> and

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<sup>150</sup> This rather cancels out Habermas' accusation of Gadamer not being politically engaged.

<sup>151</sup> Arnold, *Culture*, 69.

<sup>152</sup> Ricoeur, *Reader*, 172.

<sup>153</sup> “It is possible to give a concrete and detailed analysis of any utterance, once having exposed it as a contradiction-ridden, tension-filled unity of two embattled tendencies in the life of language,” Bakhtin, *Dialogic*, 272. “Linguistics, stylistics and the philosophy of language” could make no provision for the dialogic nature of language, which “was a struggle among socio-linguistic points of view,” *ibid.*, 273. “Language is not a neutral medium that passes freely and easily into the private property of the speaker's intentions; it is populated – overpopulated – with the intentions of others,” *ibid.*, 293-4.

<sup>154</sup> “A naturalistic, Darwinian terminology flatly omits the term [God], with a corresponding set of implications—and that's that,” Burke, *Language*, 46.

those which work towards God, to say nothing of pantheistic systems, which may share some interesting overlaps with both.

Pupin's autobiography unifies life, action, politics. The themes of science and nation in this paper will essentially be addressed in terms of the poetic or symbolic value of the narration (the non-poetic aspect being the *explanation* or discursive aspect of the former).

#### **1.2.1.7. Ideals as poetic beliefs**

Thus far, it has been suggested that Pupin adopted "poetic ideals" of both science and of nation. This can be seen in the language used to describe these ideals (such as "freedom", "saints of science", "president as prince") and in the ideals themselves, which can be placed within the context of Romanticism. It is the latter that will be introduced here.

While the heyday of Romanticism technically predates Pupin, certain romantic ideals continued in their relevance beyond their nascent age, as is shown by, for example, Isaiah Berlin's famous essays on Herder, in more recent decades.<sup>155</sup> What will be described as romantic is the romantic reading of the classics, wherein they catered to a concept of ideal progress; autonomy (both of the individual and the nation); the importance of poetry; the possibilities and importance of education—as per Rousseau's *Émile*; the role of the liberating narrative, whereby one is free to seek one's dreams and embark on exploration; a belief in humanity; a belief in ideals. It is noted that such ideals are summed up in Arnold's *Culture and Anarchy*, which was a product of the Victorian age.

A note must be made here as to the scope of texts that will be referred to for this section that is to sketch out the larger context of scientific thought leading up to and during the time of Pupin's life. The texts will liberally span almost two centuries, so as to include the Romantic poets and Herder's ideals and what can be termed an albeit short-lived period

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<sup>155</sup> Berlin's work helped to popularize Herder, and make him again relevant in 20<sup>th</sup> century academia. It ought to be noted that while Berlin cautions that, "it is a historical and moral error to identify the ideology of one period with its consequences in some other", Pupin's Romantic national beliefs were far closer to the "democratic and peaceful" tenets and "loose textures... natural ties" that Berlin attributes to Herder than to xenophobia and irrationalism to which Berlin's warning applied. Isaiah Berlin, "Herder and the Enlightenment," in *Isaiah Berlin: The Proper Study of Mankind*, ed. Henry Hardy and Roger Hausheer (New York: Farrar, Straus and Giroux, 1997), 401.

of panhumanity<sup>156</sup> or universalism.<sup>157</sup> Given the very concerted effort on the part of poets and writers in the 18<sup>th</sup> century to bring this about, an impressionistic sweep of a longer span of time can be justified. The danger is that this section will become reductionist for there are always counter-trends and it is even argued, as Randall did, that the term romantic idealism is tractable where national trends are considered.<sup>158</sup> Today it is our postmodern uncertainties that teach that there are many ‘stories’ to be told and that one ought to pick up the strands of the story that make the most sense to one’s limited mind. What is more, Randall himself gave a definition of Romantic idealism that is applicable to the parameters of Pupin’s own ideological thought: its proponents “are the only thinkers of modern times to attempt a formulation of the good life... who... really cared about wisdom.”<sup>159</sup> We shall be revisiting this idea later in terms of an explanation of the meaning of the ultimate claims made in Pupin’s autobiography. For such an idealism is primarily imaginative and only secondarily scientific, it: “is an imaginative and symbolic rendering of life, illuminating its possibilities, rather than describing its actual limitations. Romantic idealists like Fichte make no claim to the possession of literal truth: Kant had banished for them that illusion. What they proclaim is rather faith, a faith that will give meaning to life. It is the claim of

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<sup>156</sup> This term was coined by Bishop and Saint Nikolaj Velimirović in “The New Ideal in Education,” in *Sabrana dela* (Linc: Srpska Pravoslavna Eparhija za Zapadnu Evropu, 1986), accessed September 5, 2011, <http://www.monachos.net/content/patristics/patristictexts/697>. Velimirović also addresses the panhumanistic idea in connection with Dostoevsky, see for example, “Panhumanism,” in *The Religious Spirit of the Slavs* (Westminster: St. Margaret’s, 1916), accessed September 5, 2011, <http://www.gutenberg.org/files/13388/13388-h/13388-h.htm#PANHUMANISM>. A digression here is necessary as the most promoted critical review of Velimirović’s works in the West decontextualized these ideas. For the context referred to here, please refer to Greta Goetz, “Nikolaj Velimirović’s Views on Literature” (MA thesis, Belgrade University, 2008).

<sup>157</sup> Velimirović wrote about the Universal Man – and while the term speaks for itself, it also connotes the magnanimous hopes for the human soul in Emerson, as well as the potential of the human soul to take all of nature within itself. Incidentally, Thoreau largely popularized aspects of Eastern thought in the US. For example, Henry David Thoreau, “Ethnical Scriptures: Chinese Four Books,” *The Dial* IV, no. 2 (October 1843): 205, [http://www.walden.org/Library/About\\_Thoreau%27s\\_Life\\_and\\_Writings:\\_The\\_Research\\_Collections/The\\_Dial](http://www.walden.org/Library/About_Thoreau%27s_Life_and_Writings:_The_Research_Collections/The_Dial). Along these lines, too, is Whitman’s “Song of Myself,” in *Leaves of Grass* (New York: Andrew Rome, 1855), accessed June 12, 2011, <http://www.gutenberg.org/files/1322/1322-h/1322-h.htm>. Considering, too, the universalist efforts of Rabindranath Tagore, also through his literature, it is argued that an argument can be made for a panhumanism in the 19<sup>th</sup> and early 20<sup>th</sup> century.

<sup>158</sup> John Herman Randall, “Romantic Idealism,” in *The Career of Philosophy Volume II: From the German Enlightenment to the Age of Darwin* (New York: Columbia University Press, 1965) 199-200.

<sup>159</sup> Qtd. in J. Glenn Gray, “Randall on German Idealism,” in *Naturalism and Historical Understanding*, ed. John Peter Anton (Albany: The Research Foundation of the State University of New York, 1967) 126.

the idealists... that all discourse and all knowledge is a metaphor. Idealism, that is, is not science, but imagination, poetry and art—and so is science!”<sup>160</sup>

During the Victorian age, there was a curious overlap of disciplines viewed through a Romantic lens. Shelley, Coleridge, and Wordsworth all took an interest in science, which was even covertly propagated to girls in Jane Marcet’s dialogic novels. Cross-pollination was not limited to science: Shelley influenced Marx, who was also influenced by Vico. Dickens was, in addition to being a realistic influenced by the Romantics, a social critic and such a strong believer in the advance of science that he worked to popularise it, such as through Percival Leigh’s rather forced narrative (possibly mimicking the precedent in Jane Marcet’s novels) to describe those scientific discoveries that could be illustrated through everyday objects, like tea kettles and candles.

It was an age of ideals, which could also be said to be true of Marxism. *Mimesis*, Auerbach’s review of Western literature which he ironically wrote in the Turkish East, names these ideals as the culmination of ‘freedom’, ‘autonomy’, ‘class [therefore nation?] conscious’, ‘internal, emotional’ values which seem to have taken root during Romanticism. But, as all words higher up in the symbolic hierarchy, such words are defined according to the system of the person using them: Pupin’s and Ruskin’s definition of ‘freedom’ is more alike than Pupin’s and Marx’s, for instance.

There were also larger trends of thought underway that only partly, if at all, overlapped with Pupin’s ethos. Baconian empiricism became a Romantic ideal. It came to mean: out with the experience of ancestors and in with the value of personal experience, above all. It is arguably just when Baconian ideals were brought to the university system that Romanticism departs from the Aristotelian and Platonian (the “good life”), and nears the Atomist, Epicurean view.<sup>161</sup> This shift was not due to what he wrote or believed as much as it was to how his ideas were applied. For example, in his most well known tract on science, *The New Atlantis*, the scientific institution Salomon’s House was ultimately

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<sup>160</sup> Randall, *Naturalism*, 127.

<sup>161</sup> These are generalizations; Philip Larkin, for example, curiously rejected the materialist offshoot of Epicureanism in his poem, “Aubade”: “And specious stuff that says No rational being/ Can fear a thing it will not feel, not seeing/ That this is what we fear – no sight, no sound,/ No touch or taste or smell, nothing to think with./ Nothing to love or link with,/ The anaesthetic from which none come round,” *The Times Literary Supplement*, December 23, 1977, accessed September 5, 2011, <http://www.poetryfoundation.org/poem/178058>.



dedicated to the “study and works of the creatures of God”.<sup>162</sup> In this respect, Bacon’s scientific metaphors were original and a prescription to save mankind in his age from a stale religion by renewing it through an exposure of that deceit and those illusions. In fact, *The New Atlantis* bears a warning that if pride replaces piety, science and technology will become sterile and self-destructive—as many fear is the case today. That point is reminiscent of some of Pupin’s messages pertaining to science, which may be demonstrated by the spirit of scientific research that he supported, described as being a zeal for the truth, devotion to duty, and faith in the good.<sup>163</sup>

Yet, perhaps most illustrative of the late 18<sup>th</sup> and early 19<sup>th</sup> century was the Romantic revolt against, “everything that differentiates man from the cold calculating machine” of the kind Babbage was making.<sup>164</sup> The British Romantic poets idealised a Rousseauian return to nature. The Germans sought the folk for knowledge, Rilke travelled to see the Russian peasants—who, along with the German ones, also influenced Kandinsky. Such quaint concern for the local, peaking at the dawn of the 20<sup>th</sup> century and beginning a century before,<sup>165</sup> seems to have been cast out immediately afterwards. The complication in considering this Romantic age emerges if we consider Randall’s argument that “science in breaking from the narrative and fixed forms of 18<sup>th</sup> century mechanics and mathematics and being frankly inquiring and explanatory has felt romantic influence.”<sup>166</sup> Rousseau, Randall argues, presented science with a golden opportunity in his instinctive appeal to the human heart—as opposed to the precious ego, rational, elaborate apologies. In this way, science followed his *methods* not conclusions.<sup>167</sup> “If the rationalists were not always reasonable neither were the romanticists always irrational. So long as there was a common inspiration

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<sup>162</sup> Francis Bacon, *The New Atlantis*, accessed 7 July, 2011, <http://www.gutenberg.org/files/2434/2434-h/2434-h.htm>, there are no page numbers or bibliographical information for this kind of gutenberg.org text.

<sup>163</sup> Pupin, *Immigrant*, 377. It is noted that these ideals were those spoken of by Tyndall but which Pupin sought to be “aiding whenever an opportunity presented itself”.

<sup>164</sup> He is considered one of the fathers of the modern computer; his “machine” is also considered representative of the Cartesian view of the universe. More on that later.

<sup>165</sup> “Enthusiasm for the achievements of the collective genius of primitive societies, under the impulse of Rousseau, was transformed into a European movement by Herder’s passionate advocacy.” Also, “his insistence that outlooks and civilizations must be understood from within” and see especially, ““Let us be characteristic of our nation, language, scene””. Berlin, *Isaiah*, 389, 390, 397.

<sup>166</sup> Randall, “Romantic,” 5.

<sup>167</sup> *Ibid.*, 6.

hatred of the old system, and a common interest ... they could cooperate.”<sup>168</sup> It is here where we may begin to understand why it is that today we have lost our faith not only in religion, but also in posterity and words: a symbolic shift occurred where mechanical science substituted itself for faith of the heart—but as a reduced metaphor, has been unable to ultimately cater to our needs. But Pupin’s autobiography reveals a very different kind of science, which is tied to his mother’s religious views and his Romantic Idvor village beginning. He writes in the first chapter to his autobiography that he believes (note the present tense) the Psalm that states, “The heavens declare the glory of God,” and he quotes Lyermonoff, “Night is silent and the plains are whispering to God, and star speaketh to star”,<sup>169</sup> which may be cited as an example of how he was as Romantic as his science was rational, and in this way exemplary of a certain class of Victorian polymath. This is also an important quotation because it introduces the stellar metaphor that is central throughout the autobiography.

With regards to poetic ideals, in Pupin’s hierarchy, God is at the top of the science of the heavens and this theology spreads to the spoken word, in the Psalm of David also quoted by Pupin at the outset of his autobiography: “There is no speech nor language, where [the voice of the heavens] is not heard.”<sup>170</sup>

### 1.3. Introduction to Pupin's autobiography

*From Immigrant to Inventor* was first published as installments in *Scribner’s Magazine* from September 1922-August 1923,<sup>171</sup> appearing as a book in September 1923, and won the Pulitzer Prize in 1924.

Pupin begins his autobiography with a description of his childhood in Idvor. The most significant aspects to this work were the stories that were told, the poetry, his experience with nature, and his respect for his elders. Many of the latter told stories of how the Serbs kept up the front on the side of Austria against Frederick the Great. Some of the elders had fought in the Napoleonic wars securing Austria's victories while the younger

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<sup>168</sup> Randall, “Romantic,” 15.

<sup>169</sup> Pupin, *Immigrant*, 18.

<sup>170</sup> *Ibid.*, 18.

<sup>171</sup> *Scribner’s Magazine* 72, no.3-74, no.2, September 1922-August 1923, accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?view=mjp\\_object&id=1233672898402506](http://dl.lib.brown.edu/mjp/render.php?view=mjp_object&id=1233672898402506).

men had participated in the campaigns in Italy in 1859 and 1866. In return for fighting on the side of Austria, these military frontiersmen were granted freedom. However, the villagers' relationship to Austria changed after 1869, when the nationalism of Emperor Francis Joseph of Hapsburg began. This was important to Pupin, and led to some of his later behaviour as a student. It almost led to his expulsion from high school, twice.

His memories of early life were punctuated by the stories the elders told and epics they recited at night by the hearth in the evening which fuelled his strong sense of Serbian identity, his practical experience as a cowherd, and the spiritual advice of his mother. He knew the Psalms, the poetry of Ljermontoff, Serbian folk songs, and epic poems, and was able to recite the life of St. Sava as a boy.

Pupin was a bright child, and the village priest soon recommended that he join the high school in Pančevo. There, he was introduced to the wonders of Franklin and his kite by his Slovenian teacher, Kos. After almost being expelled from his Pančevo high school, the archpriest saved the course of Pupin's future education by arranging for the continuation of his schooling to be in Prague. There, he had a difficult time with "Teutonic pride" and was torn between spending time with his books and nationalist propaganda, Czech nationalism being strong at the time. He read Yan Huss,<sup>172</sup> and compared him to St. Sava. It could be said that this was the beginning of his intellectual (apart from Banat-inherited) approach to multiculturalism, wherein, as per Herder, for example, wrote that, "No greater injury can be inflicted on a nation than to be robbed of her national character, the peculiarity of her spirit and her language".<sup>173</sup> While in Prague, his father died, which spurred him, according to his autobiography, to leave the city for America, as his sister had forbidden him to return to tend to the land, and he did not want his studies to continue to be a financial burden to his family. He was fifteen.

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<sup>172</sup> NB. This spelling and some others in this chapter were used by Pupin.

The chapter of Jan Hus in terms of his importance to the greater region around Czechoslovakia deserves more attention. His life was even addressed by Velimirović in *Religious*, in a chapter devoted to him. This moment of 'nationalism' was much closer to Herder's ideal, much more Romantic in nature, than the very different 'nationalisms' which emerged on the eve of and after World War II. This footnote stands as a reminder that that what came during Hus's and Pupin's time has very little to do with what came afterwards, which is all the more reason to reexamine the values of these universal personages, to rescue their relics from the debris of history.

<sup>173</sup> Johann Gottfried Herder, *Materials for the Philosophy of the History of Mankind*, in *The Internet Modern History Sourcebook*, accessed September 5, 2011, <http://www.fordham.edu/halsall/mod/1784herder-mankind.asp>.

Articles in American newspapers at the start of the 20<sup>th</sup> century give a different account of his immigrant beginnings than those he gives in his autobiography. According to the American press, he left his home country in order to “escape service in the army”<sup>174</sup>. Allegedly, he “didn't want to follow in the footsteps” of his ancestors who had been defending the Austro-Hungarian frontier, and when his parents “wouldn't allow him to select a peaceful pursuit, he ran away from home to escape the army and the drudgery of it”.<sup>175</sup>

His arrival in America with only five cents and donning but light clothes and a fez has entered the annals of history with mythical status. He gained entry to the country partly because of his knowledge of Franklin, Lincoln, and Harriet Beecher Stowe. Thus began his entry into the literary history of the United States.

His initial work as a “greenhorn”, an inexperienced immigrant, was as a farmhand in Delaware, Maryland, and later New Jersey. At the first farm was a young girl who he compared to a Serbian fairy (*vila*) who taught him English. While he objected to the notion of his becoming an American because he had fled Hungary and Prague to avoid being turned into a Hungarian or Austrian, and did not want to “drop his Serbian notions,” he won his audience over with tales of the heroism of Serbian women, which demonstrates his interculturalism in that the reference to Austro-Hungary was akin to Herder’s mistrust of absolutism and Prussian nationalism; his interculturalism, like Herder’s,<sup>176</sup> allowed for the self-expression of a people’s identity. Pupin writes that when he learned of Washington he compared him to Hajduk Veljko.

Before and after New Jersey, he spent some time in New York. First, he did odd jobs based out of a small hotel, like painting and carrying coal. Later, he found a job at a

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<sup>174</sup> “Gains Fame Here,” *The Tensas Gazette*, November 2, 1917, 14, accessed August 6, 2012, <http://chroniclingamerica.loc.gov/lccn/sn87090131/1917-11-02/ed-1/seq-14/?words=Michael+Pupin?date1=1917&rows=20&searchType=basic&state=&date2=1917&proxtext=michael+pupin&y=14&x=19&dateFilterType=yearRange&index=5>.

<sup>175</sup> “Rose From Obscurity,” *The Washington Bee*, November 8, 1902, 3, accessed August 6, 2012, <http://chroniclingamerica.loc.gov/lccn/sn84025891/1902-11-08/ed-1/seq-3/?words=Michael+Pupin?date1=1902&rows=20&searchType=basic&state=&date2=1902&proxtext=michael+pupin&y=0&x=0&dateFilterType=yearRange&index=6>. Also see, “Adopted Sons of Uncle Same Made Good,” *The Sunday Oregonian*, March 18, 1906, 40-41, accessed August 6, 2012, <http://oregonnews.uoregon.edu/lccn/sn83045782/1906-03-18/ed-1/seq-40/>

<sup>176</sup> Herder, *Outlines of a Philosophy of the History of Man*, vol. I, (New York: Bergman Publishers, 1800), accessed September 5, 2012, [archive.org/details/outlinesaphilos00churgoog](http://archive.org/details/outlinesaphilos00churgoog), 163-6.

cracker factory, where he was guided by Jim, the boiler-room engineer, who encouraged him in his scientific readings at the Cooper Union Library. He read about Watt, read Tyndall's lectures, Hunt's *Poetry of Science*, which he compared to Milton's *Paradise Lost*, Longfellow's "Hiawatha" and William Cullen Bryant's "Thanatopsis", and pored over issues of the *Scientific American*, with the help of—a pocket dictionary.

It is interesting to note the influence that the Cooper Union painting "Men of Progress" had on him. The fresco inspired him to read about the lives of all of the men depicted in it; he thus came to know figures such as Morse, Howe (inventor of the sewing machine), and Ericsson (engineer of the Monitor). The fresco united in his mind the power of what mechanisms can do with the great men who "fought for the ideals of the United States".<sup>177</sup> In other words, "the steam engine without great men behind it would have been of little avail." He defined the country as "a monument to the lives of the men of brains and character and action who made it."

During his employment at the cracker factory, he was advanced to position of shipping clerk. He further benefited from his employment there thanks to the informal tutoring he received from a German, Bilharz, who sang ecclesiastical songs such as Ave Maria, and recited Greek and Latin poetry, as well as that of Goethe and Shakespeare. He enthusiastically tutored Pupin in the works of the great poets, orators, philosophers, and sculptors of ancient Greece, revering its idealism, which he contrasted with the materialism of modern America. He spared no pains in warning Pupin of the worship of scientific materialism, though he was most pedagogically effective at infusing Pupin with a love for the study of ancient Greek and Greece,<sup>178</sup> instilling Pupin with the beginnings of an education appropriate for one who would become a proponent of interculturalism (classicism and broad literary influences were also characteristic of Herder's intellectual formation; the very distance of ancient Greek literary works in itself already promotes an interculturalism if they are to be connected to the culture and time in which they are read). The extent of the influence of this liberal education in the humanities can be found in Pupin's later observation that his study of ancient Greece and the civilization of the Anglo-

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<sup>177</sup> Pupin, *Immigrant*, 78.

<sup>178</sup> *Ibid.*, 131.

Saxons “made every other study in my college curriculum appear insignificant, although I ... never gave up the idea that my future work would be in the field of science.”<sup>179</sup>

Pupin's night-time reading consisted of the “Mayflower Compact”, “The Declaration of Independence”, “The American Constitution”, Patrick Henry’s and Daniel Webster’s speeches and Lincoln’s “Gettysburg Address”.<sup>180</sup>

It was his chance encounter with a Slovenian family that caused him to consider enrolling at Columbia College on the strength of his knowledge and his physical prowess. It was suggested that his athletic build would be considered an asset if he were to apply on the condition that he join the rowing team.

According to the autobiography, another serendipitous meeting, of a certain member of the flock of Henry Ward Beecher, brother to the famous authoress, led to his enrolment in a Greek and Latin study group, which helped pave the way for Pupin’s social as well as academic readiness for the Columbia entrance exams. This was at Adelphi College.

It ought to be noted here, again, that his own account of this part of his life differs from the account in the dozens of articles printed about this period. According to several newspaper reports, he had difficulty finding employment, and ended up working as a ‘rubber’ at a Turkish bath in Brooklyn.<sup>181</sup> While there, he “talked incessantly” and one of the patrons, a member of the Episcopal clergy, Rev. Dr. Horner,<sup>182</sup> was so taken with him, that he obtained for him a scholarship at Adelphi College, also in Brooklyn. He studied there during the week and continued to work at the bath at the weekends. It was said that he earned enough to subsist on thanks to cash prizes he won while studying at Adelphi. According to the press accounts, he continued from Adelphi to Columbia<sup>183</sup>—and from this point on, the media's account of Pupin’s life agrees with his own.

A summer of study and physical labour in the countryside, which had the added advantage of reducing the expenses he paid for lodgings, marked the end of his college

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<sup>179</sup> Pupin, *Immigrant*, 133.

<sup>180</sup> *Ibid.*, 88.

<sup>181</sup> E.g. “Gains Fame Here.”

<sup>182</sup> E.g. “Rose From Obscurity,” Hurton J. Hendrick, *The Age of Big Business* (New Haven: Yale University Press, 1919), “Adopted Sons of Uncle Same Made Good,” Dugald C. Jackson, “Michael Idvorsky Pupin,” *Proceedings of the American Academy of Arts and Sciences* 27, no. 10 (May 1938), 379-385, accessed September 5, 2011, <http://www.jstor.org/stable/20023330>.

<sup>183</sup> E.g. “Rose from Obscurity,” and “Gains Fame Here,” which claims that it was the daughter of a farm owner who interested him in education.

preparations and he was admitted in autumn 1879. The muscles he had developed led to respect among his peers, which was no small feat, and this combined with his intelligence secured for him a coveted tutoring position of certain well-to-do students. He was a popular student, and was elected class president in his Junior year. He graduated with honours in 1883, at the same time that he was awarded American citizenship—an event he describes with great emotion.

After a brief trip home to Idvor, which reminded him of the virtue of humility, Pupin continued his education at Cambridge, where he began his days by reading Campbell's *Life of James Clerk Maxwell*, recommended to him as an example of “moral courage”.<sup>184</sup> Like Maxwell, he considered there to be more important questions than “What is Light?”<sup>185</sup> namely, spiritual issues.

Of historical note is the fact that Pupin was subjected to the laborious task of taking the mathematical tripos before he was permitted to embark on furthering his knowledge of Maxwell's achievements. This is noteworthy because many before him had expressed similar dissatisfaction, since the days of The Breakfast Club. Babbage, Herschel, and Whewell had complained that there were too many drills that unnecessarily detracted from original research.<sup>186</sup>

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<sup>184</sup> Pupin, *Immigrant*, 145.

<sup>185</sup> *Ibid.*, 166.

<sup>186</sup> Laura J. Snyder, *The Philosophical Breakfast Club* (New York: Random House Inc., 2011), 34-43, for example. While the club was ostensibly and initially a mathematical one, the ideology was Baconian, to group “fellows with different knowledge-gathering jobs,” specialized ones, for the “improvement of society,” 42. Also see 147- 148, re. “young men at Cambridge should be able to graduate with honors degrees in the sciences, as well as in classics and mathematics” and the inception of the term “scientist”. It should be noted that their youthful zeal changed in their later years. “And thus, with the hoped-for transformation of the man of science, came some changes that the members of the Philosophical Breakfast Club had not anticipated, and would have regretted deeply. Only ten years after Whewell’s death, Maxwell himself bemoaned the fact that science was becoming overly specialized,” 366. Compare this last quote with Pupin’s description of the tripos, *Immigrant*, 180-4, “I did not believe that the Cambridge tripos method of laying a foundation in mathematical physics was fitting in my particular case,” *ibid.*, 181. He did not find “the spirit of inquiry” at Cambridge, 179, only the tripos. To Pupin’s mind, Maxwell embodied that spirit of inquiry he was seeking, 179. “Maxwell... was one of the earliest leaders of the Cambridge movement which demanded a modification of the mathematical tripos, favoring more a spirit of research,” 183. Pupin describes the establishment of the Cavendish Physics Laboratory as “a concrete expression of this movement,” 183. Where Pupin’s hero Maxwell saw the dangers of overspecialization at the end of his life, which predated Pupin’s, Pupin did not. Also, as will be pointed out below, it was precisely Pupin’s knowledge of mathematics that enabled him to come to certain discoveries – and he was often proud of his knowledge of mathematics, a knowledge that American scientists of his time were not known to possess.

But Pupin thus became one of the “wranglers struggling with their symbols” that Maxwell had written about.<sup>187</sup> Pupin found his humanities background stronger than that of his Cambridge peers but his knowledge of mathematics lagged far behind,<sup>188</sup> which he ascribed to the deficit of such learning in American universities. It is of no small irony that his inventions were later based on<sup>189</sup> and lauded for their superior application of mathematical formulae.<sup>190</sup>

As he struggled to keep up at Cambridge, he was told that his mathematical knowledge was not good enough to understand Maxwell’s great treatise, but was given Maxwell’s *Matter and Motion* to read. His description of this book reflects his perception of science: “There was not only much poetical beauty and philosophical depth in this tiny and apparently most elementary book on dynamics, but there were also many illustrations of the close connection between this fundamental science and other departments of physical science.”<sup>191</sup>

During one of the summer holidays while he was at Cambridge, he went to France to improve his knowledge of the language, which he was inspired to do as three French scientists were so admired by Maxwell, which is especially interesting, especially given that at the time of Maxwell’s life, very few Britons were predisposed toward the French, the rare exceptions being the few sympathizers in the scientific community, who were anxious to catch up to France’s developments in the field. Maxwell had praised Ampère, Laplace and La Grange. Pupin stumbled on the latter’s *Mécanique Électrique* on his return from France at a second-hand bookshop in Paris. He was able to understand the work thanks to his study of French that summer and his prior mathematical training—which he had previously thought unconnected to physics—at Cambridge. He would later attribute the success of the Pupin coil to his knowledge of La Grange.<sup>192</sup>

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<sup>187</sup> Lewis Campbell, *The Life of James Clerk Maxwell* (London: Macmillan & Co., 1882), 106, accessed September 5, 2011, <http://archive.org/details/lifeofjamesclerk00campuoft>.

<sup>188</sup> Pupin, *Immigrant*, 177.

<sup>189</sup> *Ibid.*, 330-1, 335, “I was guided by the mathematical solution of the generalized La Grangian problem,” and “the extended La Grangian problem had a very important technical value,” 338.

<sup>190</sup> *Ibid.*, 338, “In Europe, particularly in England, the invention came as a surprise; they did not expect an American to make an invention which required so much mathematical analysis of electrical motions, to which the American physicist had contributed very little”. Also viz. 348, where he attributes his being called a “wizard” to his mathematical knowledge that came from La Grange.

<sup>191</sup> *Ibid.*, 179.

<sup>192</sup> *Ibid.*, 348.



He read Campbell's *The Life of James Clerk Maxwell* for the second time that summer when he visited Idvor. "I told my mother that Maxwell and La Grange were two great saints in the world of science, and she regarded my reading during that summer as a study of the lives of saints."<sup>193</sup> His mother told him, "Cambridge is a great temple consecrated to the *eternal truth*: it is filled with icons of the great saints of science. The contemplation of their saintly work will enable you to communicate with the spirit of *eternal truth*."<sup>194</sup> While Pupin did not think that all Cambridge dons were saints, he regarded Maxwell as one of them.<sup>195</sup>

Interestingly, he cites Maxwell's essay on Faraday, which appeared in *Nature* magazine, in which he wrote that the teachers of science are expected, "to bring the student into contact with two main sources of mental growth, *the fathers of the sciences*, for whose personal influence over the opening of the mind there is no substitute, and the material things to which their labours first gave meaning."<sup>196</sup> This is important for three reasons. Firstly, it underlines Pupin's understanding of science through those who discovered or clarified scientific ideas. This understanding is illustrated by his admiration of the men in the Cooper Union fresco, which will be described in more detail later. Secondly, the iconic meaning suggests that the men were perceived as windows to the ideas they had elucidated, in line with his mother's teaching and one of the three aspects of cultural memory privileged by Kristeva.<sup>197</sup> Thirdly, this idea of Maxwell's is clearly illustrated in the Greek inscription with which he began *Matter and Motion*, λαμπάδια ἔχοντες διαδώσουσιν ἀλλήλοις ἀμυλλόμενοι τοῖς ἵπποις: enlightenment is *passed on* to others. So, without people as a medium, knowledge could not be passed on.

This idea is important because it is quite contrary to the deconstructionist and New Criticism offshoots of Barthes' (later self-) contested work, *The Death of the Author*, which privileged breaks in meaning and departures from authorial intent, subversive of critical work where people were the medium, whether in authorial voice or, for example, teaching rhetorical expertise in text comprehension, analysis of definition and logic. Maxwell

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<sup>193</sup> Pupin, *Immigrant*, 190.

<sup>194</sup> *Ibid.*, 191.

<sup>195</sup> E.g. *ibid.*, 178.

<sup>196</sup> *Ibid.*, 193.

<sup>197</sup> Julia Kristeva, *Crisis of the European Subject* (New York: Other Press, 2000).

understood there are authorities and there is a corpus of knowledge that can be learned and handed down to posterity. Also, it was through Maxwell that Pupin came so meaningfully to La Grange. However, this passing down did not have to be done literally, from one person's hands to another's, as seen in his admiration for how Helmholtz better understood Faraday than Tyndall did, though the latter had known Faraday in person.<sup>198</sup> Emphasis here is on the affinity one human being has for another's ideas. "Today we know that new physical concepts requiring a new language for their expression had to be created in the minds of scientific men before the modern electromagnetic doctrine could ever be revealed to the world."<sup>199</sup>

It may be surmised that such an openness to affinity, which may be connected to the intuitive *noein*, is cultivated in some cultures more than others. After all, Arnold chooses the word "Hellenism" to describe the free flow of consciousness. Also, Kristeva gives precedent to categories that are arguably γνῶσις, in the sense of spiritual enlightenment, or insight.

Pupin conveyed a mixture of such affinities, cultural references, and his mother's understanding of science to Tyndall on the occasion of their meeting after Pupin had successfully completed the trip.<sup>200</sup> Pupin describes Tyndall's amusement, which centered on the Serbian expression Pupin used, "like a goose in a fog" to explain bewilderment, as well as a play off of cultural expectations, including the question of whether Pupin could pass as Irish, which Tyndall jokes he might have done during his Alpine adventures. In this context, Pupin's intercultural references were forthcoming through his having "seen", or arguably, sensed, that Tyndall both enjoyed and encouraged informal conversation.<sup>201</sup> (It should be noted that Tyndall also writes a definition of *noein* which he acknowledges in *Matter and Force*:<sup>202</sup> arguments in favour of localizing modes of seeing are tenuous, but not

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<sup>198</sup> Pupin, *Immigrant*, 236. Also see 196, where he outlines his idea that, like holy days are devoted to saints, certain days should be attributed to scientists, who decipher "divine messages" through which, through physical phenomena, God addresses man.

<sup>199</sup> *Ibid.*, 219.

<sup>200</sup> *Ibid.*, 207-9.

<sup>201</sup> *Ibid.*, 208.

<sup>202</sup> We take Pupin's word that Tyndall was "poetic". On the discovery of atomism, Tyndall writes: "the secret of the universe was open to the human understanding. It was found that the mind of man had the power of penetrating far beyond the boundaries of his five senses; that the things which are seen in the material world depend for their action upon things unseen; in short, that besides the phenomena which address the senses, there are laws and principles and processes which do not address the senses at all, but which must

unfounded.)<sup>203</sup> Pupin received the fellow of physics from Columbia University, and went with Tyndall's recommendation to study mathematics on a fellowship in physical chemistry under the esteemed Helmholtz, receiving his doctoral degree in 1899 for the thesis entitled, "Osmotic Pressure and its Relationship to Free Energy".

However, before venturing to Germany, he spent the summer in Scotland in order to get closer to the spirit of Maxwell, and also to retire to read Faraday's *Electrical Researches*. He found the "originality, individuality and sturdiness" demonstrated in the mental activity of Maxwell that was so "hard to follow" to be reflected in the Highland dances.<sup>204</sup> This observation demonstrates the visual aspect of Pupin's thought, and how he neatly surmised that Maxwell's electrical theory differed from any other. It also demonstrates the broader view he took of a nation's culture to include, as did Herder,<sup>205</sup> folklore, music, and dance, as well as his receptivity to the distinctions of different cultures.

The autobiography, thus far, is a chronological account of his life, which elucidates the ideological issues that were of importance to him.

As part of his study in Germany, he conducted experiments in the laboratory for the first time and attended Helmholtz's lectures which showed "beautiful experiments".<sup>206</sup> The latter's lectures were also attended by an audience as diverse as army officers, and Pupin explains that he was "interested in the application of science to the solution of problems which would advance the industries of Germany".<sup>207</sup> Despite Pupin's approval in this context, he was also very critical of the dangers of practical application, such as through unchecked growth of the corporation, which he addressed in his series, *Romancing the Machine*. But, just as he suspects Helmholtz was being consulted to help with the German army and navy,<sup>208</sup> Pupin went on to do the same.

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be, and can be, spiritually discerned," in John Tyndall, *New Fragments Vol. I and II* (London: Longmans, Green and Co., 1879), accessed September 5, 2011, <http://www.gutenberg.org/files/24527/24527-h/24527-h.htm#Toc158391643>.

<sup>203</sup> Pupin himself writes that Tyndall and Hunt taught him that "Slavs were not the only people who, as I had been inclined to think, see the poetical side of science, but that everybody sees it, because science on its abstract side is poetry, it is Divine Philosophy, as Milton calls it," Pupin, *Immigrant*, 102.

<sup>204</sup> *Ibid.*, 214.

<sup>205</sup> Herder, edited by Michael N. Forster, "Treatise on the Origin of Language," *Philosophical Investigations* (Cambridge: Cambridge University Press, 2003), 73-6.

<sup>206</sup> Pupin, *Immigrant*, 232.

<sup>207</sup> *Ibid.*, 253.

<sup>208</sup> *Ibid.*, 233.

During a summer break two years into his studies in Germany, he again returned to Idvor, where his mother graced him with another symbolically ordered speech:

“Knowledge is the golden ladder over which we climb to heaven [and this knowledge includes] every knowledge which brings me nearer to God; and this new knowledge [of the vibration of electricity] certainly does. Just think of it, my son: God has been sending his messages from star to star and, according to David, from the stars to man, ever since the creation of Adam, employing the very same method and means which man, imitating the divine method, is beginning to use when he employs electricity to carry his message to a distant friend.”<sup>209</sup> In response to her connecting one of Faraday’s discoveries to the Psalms, Pupin writes, “Her religion taught her how to catch the spirit of science, and I was always certain that science can teach us how to catch the spirit of her religion”.<sup>210</sup> Understanding this is crucial in understanding Pupin’s great chain of being.

His stay in Germany highlights another leitmotif of his autobiography, namely the cultural and historical elements he was exposed to. He admits that he had arrived in the country predisposed to dislike Prussians both because of the friedlanders’ views he’d heard in America, and because of Bismarck’s anti-Serbian stand.<sup>211</sup> It was his mother who urged him to reconsider, with her high regard of German industry. There were hard-working German settlers in the Banat at the time, and there was no ill-will between Serbs and Germans, who addressed each other as “neighbour”.<sup>212</sup> Pupin’s views were also changed through the influence of a Bosnian Serb who had a cigarette shop near to the Imperial palace, and whose customers were mostly aristocrats and generals – among whom the two would sometimes dine at a near-by chop house.<sup>213</sup> Nikola successfully demonstrated that Prussians were not as arrogant as Pupin had taken them to be by showing him actual examples. This illustration is important to understanding the depth of his interculturalism; while critical of cultural oppressions of power, it is not exclusionary and admits the virtue of even cultures antagonistic to his own.

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<sup>209</sup> Pupin, *Immigrant*, 245.

<sup>210</sup> *Ibid.*, 246.

<sup>211</sup> *Ibid.*, 247.

<sup>212</sup> *Ibid.*, 254.

<sup>213</sup> *Ibid.*, 252.

Pupin came to view Germany as “a young eagle that had just discovered the wonderful power of its pinions”,<sup>214</sup> though he considered that a great nation was not only created by great men, but also “the power of the nation's traditions”.<sup>215</sup> He was impressed that the Germans had picked up where Maxwell and other scientists had had to defer: educational and political duties had kept them from finalizing their experiments. Thus his immense admiration for the work done by Hertz.

Before completing his doctoral dissertation, he was married to the sister of a Columbia friend and scholar, which met with the approval of Helmholtz: “Marriage gives that fullness to life which nothing else can give.”<sup>216</sup> This is significant because such a view was also held by Maxwell, Pupin’s other ‘leading light’ in science. At this time, Pupin was also appointed Teacher of Mathematical Physics in the Department of Electrical Engineering in the department which was to be inaugurated the year he was to get his degree.

The department initially experienced problems in maintaining independence, for some of the work it did was also connected to the disciplines of chemistry and engineering.<sup>217</sup> Pupin and his colleague Crocker won out in maintaining “that there is an electrical science which is the real soul of electrical engineering, and that every other abstract science or its application was an incident only in electrical engineering.”<sup>218</sup> The department lacked funding, which Pupin and Crocker raised by delivering popular lectures outside of the university. The audience who attended the lectures mostly consisted of businessmen who were interested in the applications of science, and had little or no prior training in science. Much of Pupin’s efforts were geared towards correcting the wrong ideas his audience had of science. In this respect, the year 1889 was not only still chronologically in the Victorian era, but culturally too, if one compares the earlier popularization of science engaged in by Dickens in *Household Words*. Although science had progressed in that interim, the American audience that Pupin addressed so lagged in their understanding of science that they succeeded in hindering the progress of science.<sup>219</sup> Another problem Pupin

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<sup>214</sup> Pupin, *Immigrant*, 258.

<sup>215</sup> *Ibid.*, 262.

<sup>216</sup> *Ibid.*, 277.

<sup>217</sup> *Ibid.*, 279.

<sup>218</sup> *Ibid.*, 280.

<sup>219</sup> *Ibid.*, 285.

encountered in his capacity of professor was the lack of time for research due to his teaching responsibilities.<sup>220</sup> But because he felt that “neglect breeds indifference, and indifference degenerates into atrophy of the spirit of inquiry,” he made time in the evenings, when the lab was free, for his personal research.

Before going into that, it is also relevant to list the number of academic and national organizations he participated in at the close of the century and that he mentions in his autobiography. During his career, Pupin was one of the charter members of the New York Mathematical Society founded at Columbia in 1888 and which later grew to become the American Mathematical Society in 1894, five years after he had joined. He was also a founder of the American Physical Society.<sup>221</sup> This body largely grew along with the growth of what Pupin called electron science.<sup>222</sup> He felt that its president, Professor Rowland, appreciated scientific idealism<sup>223</sup> in embarking on questions such as: What is matter? And: What is ether?<sup>224</sup>

He also became a member of the American Institute of Electrical Engineers in 1890—which was then subsumed by the United Engineering Society in 1904, and later operated in conjunction with the Engineering Foundation in 1916, to which Pupin acted as one of the two vice-chairmen, and later chairman. In his former capacity, he encouraged its president to “grubstake” the newly formed National Research Council, which had been formed out of the National Academy of Sciences for the purposes of promoting the research and application of sciences to increase knowledge and strengthen national defence.<sup>225</sup> In his latter capacity, in 1916-17, he organized the work of the National Research Council.<sup>226</sup> During the war, the council was responsible for the government's scientific bureaus and the technical department of the Army and Navy.<sup>227</sup> Pupin saw the National Research Council as

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<sup>220</sup> Pupin, *Immigrant*, 291.

<sup>221</sup> *Ibid.*, 352.

<sup>222</sup> *Ibid.*, 353.

<sup>223</sup> *Ibid.*, 354.

<sup>224</sup> *Ibid.*, 355.

<sup>225</sup> *Ibid.*, 365-8.

<sup>226</sup> *Ibid.*, 368.

<sup>227</sup> *Ibid.*, 369.

a major instrument in the promotion of scientific idealism.<sup>228</sup> Finally, he also sat on the National Advisory Committee for aeronautics.<sup>229</sup>

It is around this point in his autobiography that he departs from the preceding down-to-earth narrative, and begins to use a more abstract, more idealised language. The latter chapters of the book cease to be strictly chronological, but focus on his work in education and scientific experimentation. He explains the importance of a scientific education, and briefly addresses the low level of general education in the subject, a situation he worked to improve. He also describes, in lengthy detail and with much enthusiasm, his own scientific work, for he considers that all educated men should understand the basic scientific principles of the technology they use.

He detected distortions in alternating currents by comparing them to the harmonics of sound, the motion of a tuning fork. He called his discovery “electrical tuning” after Serbian bagpipers, which intimates both his skill of association and national pride.<sup>230</sup>

Despite Columbia’s “meagre laboratory facilities”,<sup>231</sup> he did some work on x-rays, being the first to replicate Roentgen’s production of them in the United States. His contribution to the field was made in 1896 when he reduced the exposure time to a few seconds as opposed to an hour through the use of a sheet of paper impregnated with fluorescent dyes that was placed next to the photographic plate.

But his x-ray experiments caused him to fall ill with pneumonia,<sup>232</sup> which later took the life of his wife, for she had contracted while nursing him. It was at this time that he settled in Norfolk, Connecticut. To take his mind off of his near mental collapse—the pneumonia had given him nightmares of green x-ray tubes and skeletons, a neighbour presented him with a pair of cobs for him to train, which he did, and was reminded of his native Banat.<sup>233</sup> Pupin recounts how the prizes these cobs went on to win were not as great as the prize of his restored health. He later traded in the horses for a faithful dog, and

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<sup>228</sup> Pupin, *Immigrant*, 375-9.

<sup>229</sup> *Ibid.*, 386.

<sup>230</sup> *Ibid.*, 299.

<sup>231</sup> *Ibid.*, 294.

<sup>232</sup> He describes this first as “x-ray fever” in his autobiography: explaining that he had finished with his x-ray research on 14 April 1896 but the next day collapsed ill with pneumonia. This account is difficult to follow as the narrative is separated by a digression. See *ibid.* pps. 309 and 322. Because he describes what took him away from his work as “x-ray fever” and later explains that his pneumonia caused him to retreat to a country house, it is assumed here that by “x-ray fever” he means “pneumonia”.

<sup>233</sup> *Ibid.*, 324.

purchased his own farm in Norfolk—giving him special insight into the mentality of the native residents, not inclined to development. He won them over not through his lofty ideas but through something as prosaic as gaining the trust of a neighbour's dog which had run away, an anecdote as demonstrative of Pupin's down-to-earth character in spite of all of his worldliness, as well as of the ethos of the locals. This anecdote is also demonstrative of his intercultural sensitivity; noting the likes and dislikes of even sub-cultures, and being broad enough as a human being (not limited exclusively to the life of the mind, for example, and no slave of status) he was able to endear himself to locals. When he had fully recovered, he returned to discoveries he had been developing in the summer of 1894.

Inspired by the way sound travels through ground, which he had learned about when guarding cattle at night as a boy, he understood something of how electricity vibrations move over a wire by comparing those distortions in alternating currents with a turning fork. Using his prior mathematical knowledge, he was able to improve the efficiency of the telephone line. This discovery led to much commercial success, both in the US and in Germany.

He had applied his mathematical knowledge to spacing coils of wire around an iron core, a known source of inductance. Through this work, he was able to improve the efficiency of the telephone line, which became known as the Pupin coil.<sup>234</sup> It was consideration of the intervals that put Pupin ahead of another scientist who came to similar conclusions. This is also the invention that Pupin is best known for, so it is important to note the role his mathematical training played in this discovery. The patent was bought by AT&T, and while the company never used the patent – though Pupin writes that a president of the company said it “stirred up the engineers and the board of directors”<sup>235</sup> by revealing the faults of their own invention – they paid him handsomely for it. AT&T bought the patent in order to increase the value of their own developments to increase the range of long distance telephone calls by taking the Pupin coil off the market. He attributes the purchase of some of his other inventions related to electrical tuning, bought by the Marconi Company, to the media coverage the AT&T deal brought him. Following this deal was one he made with Siemens and Halske in Germany, and as a result of this deal, the

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<sup>234</sup> Pupin, *Immigrant*, 330-9.

<sup>235</sup> *Ibid.*, 340.



predetermined intervals at which the loading coils were placed along the transmitting wire came to be known as “pupinization”.

It is pertinent to mention, though it is not mentioned in the autobiography, the infamous Marconi court case, in which Tesla claimed that he had been the first to develop wireless technology. Pupin said that Tesla had indeed discovered wireless before either he or Marconi, but that Tesla had “given it unreservedly to the world”.<sup>236</sup> It seems that Tesla had discovered it first, Pupin had declared his own results, and Marconi patented it as his own.<sup>237</sup> Tesla accused Pupin and Marconi’s research as being “backwards”, and wrote that he knew more about those technologies than either of them.<sup>238</sup>

In addition to his scientific work, he also describes the work of national importance that he was engaged in, both scientific and other. He describes how in 1912, he was named honorary consul to the Serbian Kingdom in the US, a duty he held until 1920. He took his capacity very seriously, and in addition to the plethora of related correspondence he wrote, such as that to help fellow Serbs take up residency in the US, he was also very active in attempting to unite the Serbs in America, who were nothing if not fragmented.<sup>239</sup> During WWII, Pupin worked for both Serbia and America.<sup>240</sup> At that time, he also worked in a research group for the detection of submarines, continued research in telecommunications, and was a member of the state council for research and state advisory board for aeronautics. He was very proud of the praise he earned from President Warren G. Harding.<sup>241</sup>

After the war, Pupin was asked by Premier Pašić to act as advisor to the Yugoslavian delegation to the Paris Peace Conference in 1912. In his capacity of honorary consul, he retained Banat as part of Serbia<sup>242</sup> despite the arrangements of the 1915 London agreement. Pupin wrote a memorandum in which he did not recognise the London

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<sup>236</sup> “Pupin Says Tesla Invented Wireless,” *The Washington Herald*, May 13, 1915, 3, accessed August 6, 2012, <http://chroniclingamerica.loc.gov>.

<sup>237</sup> E.g. David Hatcher Childress, *The Tesla Papers* (Kempton, IL: Adventures Unlimited Press, 2000), 183-224.

<sup>238</sup> Nikola Tesla, “Tesla on Wireless: Electrical Inventor Thinks Marconi’s Plants Inefficient,” *New-York Tribune*, October 25, 1907, 7, accessed August 6, 2012, <http://chroniclingamerica.loc.gov/lccn/sn83030214/1907-10-25/ed-1/seq-77/;words=TESLA+WIRELESS?date1=1907&rows=20&searchType=basic&state=&date2=1907&proxtext=tesla+on+wireless&y=15&x=15&dateFilterType=yearRange&index=2>.

<sup>239</sup> Živojinović, *Nacionalni*.

<sup>240</sup> See the firsthand sources in *ibid*.

<sup>241</sup> Facsimile in Pupin, *Immigrant*, 386.

<sup>242</sup> Pupin, *Immigrant*, 10.

agreement, given the historical and ethnic characteristics of the border areas of Dalmatia, Slovenia, Istria, Banat, Međimurje, Baranja and Macedonia. This effort of his to defend the interest of not only Serbs demonstrates the extent of his multiculturalism.

In the final years of his life, Pupin did a lot of humanitarian work,<sup>243</sup> and was especially concerned about his native Serbia and home town. He kept up a lively correspondence with some of Idvor's higher standing inhabitants, as he wished to renovate the church and contribute to the education system. He had wanted the whole of Serbia to develop as an agrarian country (and to "leave technology to the West") as he noted that if California was one of the richest states in America thanks to its citrus fruits, Serbia could become rich given the quality and diversity of its orchards. But as he hadn't wanted to preach to Serbia, he offered to pay for the renovation of the Idvor school, to make it into a model of his ideas, hoping that the rest of Serbia would follow that example. He had planned for students to gain practical experience in the fields during summer months, and to watch films, using that recently-developed technology, of the latest agricultural developments during the winter months, importing in this month the achievements of other cultures and using them in a locally-productive manner, which is yet another facet of his interculturalism. Sadly, few of his plans ever saw the light of day, despite all of the funds he had sent.

Those engagements did not stop him from taking emphatic stands in favour of the identity of America he felt most important—specifically, that America was not materialist but idealist, as seen in the selfless engagement in WWI as well as Lincoln's "immortal words: 'With malice toward none, with charity for all.'"<sup>244</sup> Thus Pupin eulogized both Serbian idealism in America and American idealism in Serbia: interculturalism being the glorification of nations within the limits of humaneness (like Herder writes that glory without limits brings corruption and disappearance)<sup>245</sup>. On this account, it is important to note that he was not a blind idealist. While citing reasons for his idealist stance towards America,<sup>246</sup> he wondered if it would be able to live up to its new, high reputation.<sup>247</sup> He was

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<sup>243</sup> Živojinović, *Nacionalni*.

<sup>244</sup> Pupin, *Immigrant*, 315.

<sup>245</sup> Herder, *Outlines of a Philosophy of the History of Man*, vol. II, translated by T. Churchill, (New York: Bergman Publishers, 1800), accessed on September 5, 2012, [https://archive.org/stream/outlinesaphilos00herdgoog/outlinesaphilos00herdgoog\\_djvu.txt](https://archive.org/stream/outlinesaphilos00herdgoog/outlinesaphilos00herdgoog_djvu.txt), 259.

<sup>246</sup> Pupin, *Immigrant*, 313-16.

also wary of the problems of presenting national characteristics given the limits of context, but perhaps more importantly, that national characteristics become more strongly etched in one's mind if one has occasion to travel back and forth between one's native and adopted land. He counted himself especially qualified to discuss the state of American ideals on this account, and felt particularly strongly about American science being viewed as idealistic, which he emphasised in his autobiography.<sup>248</sup>

He attributes his "stirring up"<sup>249</sup> of the telephone and telegraph industry to the rise in scientific research carried out by companies and felt private investments in the field, as opposed to government investment, were responsible for the leaps and bounds the US made in "a great art like telephony".<sup>250</sup> He attributed the ever larger demands on universities for "highly trained scientific research men"<sup>251</sup> to the development of industrial research.

His preface to the 1925 and subsequent editions of his autobiography stresses the goal of his autobiography, namely to address the idealism in American science, which he defends against European charges of being too materialist, or even, in the eyes of de Tocqueville, non-existent. He quotes a passage from the beginning of Chapter XI explaining that it is possible for the immigrant to see more than the native regarding idealism in American science, showing, too, that his intercultural approach is enriched by different perspectives: "The main object of my narrative has been to describe the rise of idealism in ... everything I have written so far is an attempt to qualify as a witness whose testimony has competence and weight. ... Why ... should a scientist who started his career as a Serbian immigrant speak of the idealism in American science, when there are so many native-born American scientists who know more about this subject than I do? ... there are certain psychological elements in this question which justify me in the belief that occasionally an immigrant can see things which escape the attention of the native. Seeing is believing; let him speak who has the faith, provided he has a message to deliver."<sup>252</sup>

Of interest is that some later editions also contained another extract from the book on the very first page, preceding the preface, addressing his multicultural identity as his

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<sup>247</sup> Pupin, *Immigrant*, 317.

<sup>248</sup> E.g. *ibid.*, 318-21.

<sup>249</sup> *Ibid.*, 340.

<sup>250</sup> *Ibid.*, 341.

<sup>251</sup> *Ibid.*

<sup>252</sup> *Ibid.*, 311.

most precious possession: “As I sat on the deck of the ship which was taking me to the universities of Europe ... I thought of the day when ... I had arrived on the immigrant ship. I said to myself: ‘Michael Pupin, the most valuable asset which you carried into New York harbour nine years ago was your knowledge of, and profound respect and admiration for, the best traditions of your race... the most valuable assets which you are now taking with you from New York harbour is your knowledge of, and profound respect and admiration for, the best traditions of your adopted country.’”<sup>253</sup>

Both extracts function effectively as a summary of the tone of the book, which is as much a tribute to the romantic Victorian ideals of science and poeticisms as to romantic nationalism and a non-extremist, mutually sensitive interculturalism.

Pupin spent his last days on his Northfork estate, and was buried at the Woodlawn cemetery, in the Bronx, in March of 1935.

#### **1.4. Criticism of *From Immigrant to Inventor***

The most significant review of Pupin's autobiography in Serbian was written by Miloš Crnjanski.<sup>254</sup> It is a glowing report of the book as seen through the abundance of words like *vedrina, lepa, topla*. Crnjanski also warmed to Pupin's portrayal of his birthplace (*neprolaznu vedrinu svog Idvora; ističući svoj Idvor; zakoni Idvora; ljubavlju za svoj rodni kraj; sin seljaka iz Idvora... svoj rodni kraj*). He writes of the unspoiled literary ambitions of the book, demonstrated by what he explains as its simple eloquence, and finds remarkable all the mention of his native land, such as the elders, folk traditions, and fields, particularly as they appear in what he describes as a “poetic work”. Without actually calling the work panegyric, he writes as much in the same simple eloquence he finds in Pupin's work. He underlines the importance of how Pupin and his successes continued to be inspired by his native village.

The review picks up on two other themes common to both the American literature of the time and that of the American reviews. Crnjanski writes of Pupin's achievements “from the height of success” to make it in the “powerful, American” world, all while

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<sup>253</sup> Pupin, *Immigrant*, 137.

<sup>254</sup> Miloš Crnjanski, “Mihajlo I. Pupin: Sa Pašnjaka do Naučenjaka,” *Matice Srpske* (1929): 340-2. It is relevant to note that there seem to be no other major reviews of this work registered in the Serbian library system.

drawing on the strength and value of his roots: the “diligence, humility, poverty and eternal serenity” of Idvor. Thus the book shows “the secrets” of “eternal strength” of how to go from immigrant to inventor and “one of the most famous scientists and practical helpers of the world...” The book is praised for being a guide to how to make it from humble beginnings, and in the final paragraph Crnjanski writes, “Michael Pupin, the son of an Idvor villager, powerful master of electric inventions... whose words, words and capital has so indebted our people and his place of birth”.

The book is recommended for students “into whose hands this book will come”; “an exceptional book” for “our youth”. He also writes that “our whole nation should get to know” the book.

Both the rags-to-riches storyline and the book being heartily recommended as edifying are the main features of the US book reviews at the time. As an example of the latter, one article reads: “It would be nice if you get your sons to read [it]... instead of playing golf or wanting an automobile with which to riot around the corners.”<sup>255</sup> However, the appeal to readers was made on the basis of patriotism, as it was in Crnjanski's review, but here, in favour of Pupin's American patriotism: “This is a timely and valuable lesson for many Americans, both native and naturalized, greatly undervalue their citizenship.”<sup>256</sup>

The book was most commonly recommended to youth and readers for the rags-to-riches aspect of his life,<sup>257</sup> which is, after all, not only a prominent aspect of the book, but that which is most striking about the title. This constitutes the media appeal behind Pupin's life, and was articulated most succinctly in the biographical column “Adopted Sons of Uncle Sam Have Made Good”.<sup>258</sup> Pupin is described as being “typically American” because he began his practical life “poor, obscure, with no opportunities except those he

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<sup>255</sup> “Just Talks, On Common Themes: Aspiration,” *Lewinston Evening News*, July 25, 1924, 4, accessed August 6, 2011, <http://chroniclingamerica.loc.gov/lccn/sn83030214/1907-10-25/ed-1/seq-77;words=TESLA+WIRELESS?date1=1907&rows=20&searchType=basic&state=&date2=1907&proxtext=tesla+on+wireless&y=15&x=15&dateFilterType=yearRange&index=2>.

<sup>256</sup> “An American Citizen Afield,” *Berkeley Daily Gazette*, May 10, 1926, 3, C.U. Rare Books, MS 1035.

<sup>257</sup> The range of texts considered included those available through the Library of Congress's Chronicling America, those articles the Library of Congress helped me access from overseas, those 19<sup>th</sup> and 20<sup>th</sup> century newspapers scanned and made available online, and those reviews of the autobiography available through JSTOR.

<sup>258</sup> “Adopted Sons of Uncle Sam Made Good,” *The Sunday Oregonian*, March 18, 1906, 40, accessed September 5, 2011, <http://oregonnews.uoregon.edu/lccn/sn83045782/1906-03-18/ed-1/seq-40/>.

made for himself, and ... managed to climb from the bottom to the top in a surprisingly short time.”

The theme of such reviews was sometimes reflected in adjacent columns.<sup>259</sup> One such article bore the tagline, “The Poor Boy's Chance”: “Are you a poor boy? If so, thank your lucky stars. Poor boys succeed in life because they must do things.”<sup>260</sup> The theme also comes up in *Selections of Modern American Prose*, which will be discussed in chapter five. This was also the line taken in the introduction to the series as it appeared in *Scribner's*: “Professor Pupin has written this narrative to be help to young men, and to show that absolute poverty is a great incentive.”<sup>261</sup>

From today's perspective, such a response may seem platitudinous or condescending. Take for example this review: “How astounding that the ignorant shepherd boy became the president of the American Association for the Advancement of Science.”

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The novel got a similar tagline when it was awarded the Pulitzer, described as: “the best American biography teaching patriotic and unselfish services to the people”.<sup>263</sup> Such statements can be explained by the extant views of Romantic Nationalism – and the Rousseauian views that inspired Benjamin Franklin. A review of the book in the *North American Review* explains: “Its distinctive trait is idealism ... The poet in him directed the man of science and made him see visions. It is a temperament almost non-existing in our matter-of-fact and facilely romantic Americans.” The reviewer explains that Pupin, in sharing how he became interested in science, “interprets to us in some measure the other scientists who are not so eloquent.” The review ends, “There is no better fortune in life than to have discovered a satisfactory view of existence, to have attained a large sense of reality.

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<sup>259</sup> An exhaustive search was conducted between 2011 and 2012 on the Chronicling America website, part of the Library of Congress initiative to upload century-old newspapers to the internet, as well as via advanced Google search filters. I was also assisted by a Library of Congress librarian who helped me obtain newspaper articles not readily available.

<sup>260</sup> Next to “Michael I. Pupin,” *Daytona Daily News*, January 17, 1910, 7, accessed September 5, 2011, <http://chroniclingamerica.loc.gov/lccn/sn93063916/1910-01-17/ed-1/seq-77/;words=Michael+Pupin?date1=1836&rows=20&searchType=basic&state=&date2=1922&proxtext=michael+pupin+&y=10&x=9&dateFilterType=yearRange&index=11>.

<sup>261</sup> “Notes on Scribner's Authors,” *Scribner's* 72, no. 3, accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?id=1261518915765625&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261518915765625&view=mjp_object).

<sup>262</sup> “Daily Talk about Books and Authors,” *Pittsburgh Post Gazette*, April 12, 1935, 10.

<sup>263</sup> “Pulitzer Prize for Best Novel,” *Middlesboro Daily News*, May, 20, 1924, 32.

To perceive that another has found it is likewise a satisfaction.”<sup>264</sup> Similarly, a *Washington Post* review identified the main trait of the book to be the “rise of idealism”.<sup>265</sup> The *Christian Science Monitor* review explains how Pupin gives readers a “new point of view towards the achievements of natural science, whose marvel and mystery are often clouded by the very popularity of the interest that their more obvious forms of application inspire.”<sup>266</sup> The work belongs in the context of the poetic popularization of science, arguably the same context that gave rise to Charles Dickens’ periodicals *Household Words* and *All the Year Round*, which will be described in more detail in the next chapter. *From Immigrant to Inventor* is a “biography of one of the most interesting men of science in present-day America... set down with the sensitiveness and vision of a poet.”<sup>267</sup>

Also relevant to the book’s reception in public culture was how it was used in syllabi throughout North America in the first half of the 20<sup>th</sup> century.<sup>268</sup>

In Bergen Davis’ paper on Pupin delivered to the National Academy of Sciences,<sup>269</sup> the book was described as “remarkable for its merit as literature, it is filled with the charm of poetic imagination” telling of “hardships and fortitude... [which] had a great popular appeal and has had a large and continuous sale”. Ethos and pathos were key. A similar tone was taken in *The Christian Science Monitor*: “The book adds another admirable volume to the shelf of modern autobiography... of an important man”.<sup>270</sup> The *Boston Daily Globe* also addressed the theme of the character of the book’s author, explaining the book would “thrill readers with its tale of persistence, courage, and individual effort modestly told.”<sup>271</sup>

But perhaps the most flattering of reviews was from the Proceedings of the American Academy of Arts and Sciences: “The first nine chapters... are a contribution to distinguished literature. They can be reread with the same lively interest as may be found in

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<sup>264</sup> “From Immigrant to Inventor,” *The North American Review* 219, no. 818 (January 1924): 143-4, accessed August 7, 2012, <http://www.jstor.org/stable/25113214>.

<sup>265</sup> “From Immigrant to Inventor,” *The Washington Post*, September 6, 1925, 59.

<sup>266</sup> “Michael Pupin’s Story,” *The Christian Science Monitor*, January 19, 1924, 10.

<sup>267</sup> “Pupin’s Life Story is Like an Adventure Tale,” *Boston Daily Globe*, October 27, 1923, 4.

<sup>268</sup> E.g. *English Journal* (1920’s-1930’s), *The Peabody Journal of Education* (1927,1935), *Scientific Education* (1928) via JSTOR.

<sup>269</sup> Bergen Davis, “Biographical Memoir of Michael Idvorsky Pupin,” *National Academy of Sciences of the United States Biographical Memoirs* XIX, Tenth Memoir (1938), accessed September 5, 2011, <http://www.nasonline.org/publications/biographical-memoirs/memoir-pdfs/davis-bergen.pdf>

<sup>270</sup> “Michael,” *Christian Science Monitor*.

<sup>271</sup> “Pupin’s Life,” *The Boston Daily Globe*, 4.

rereading the autobiography of Benjamin Franklin or of John Brashear.”<sup>272</sup> As mentioned earlier, it was the first part of the autobiography that was reprinted for schools and some libraries. George Sarton, who described the first half of the autobiography as admirable and the second half less romantic and attractive. “The heroic part of a man’s life is the struggling part; after victory has been achieved it is well-nigh impossible to remain much longer on such exalted plane and the lives even of the greatest men then become gradually humdrum. Most people are not aware of this because they are unable to pierce the appearances. It often happens that the great man whom they honor no longer exists.”<sup>273</sup>

The “immigrant” aspect of the autobiography was most poignantly summed up in one of the reviews cited in *Scribner’s* as the installments were released: it “brings home once again the danger of making immigration regulation too hard and fast... He himself, he declares, was convinced that he brought something to America that ought to count for much – a knowledge of and a profound respect and admiration for the best traditions of his race.”<sup>274</sup> In the same issue of *Scribner’s* this idea was developed: “While you leave the reader to draw certain inferences about what should be our guide in regulating immigration... I like particularly what you say about the immigrant retaining the best traditions of his race instead of sloughing them off for a flashy, superficial sort of alleged Americanism.”<sup>275</sup> Similarly, another review that stated: “It is a good book for those to read who think that environment is more important than heredity in individual achievement,” continuing, “the book has an interesting bearing on immigration policy... the possibility of capturing a few more Pupins by such a method would fully compensate the outlay.”<sup>276</sup> Another source explains Pupin’s story, “is just one of the many that might be told of the opportunities open even to the poorest immigrant boy in this land of promise.”<sup>277</sup>

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<sup>272</sup> Jackson, “Michael,” 385.

<sup>273</sup> George Sarton, “From Immigrant to Inventor,” *Isis* 7, no. 1 (1925): 135-8.

<sup>274</sup> *The Edmonton Journal* cited in “Notes on Scribner’s Authors,” *Scribner’s* 27, no. 6, December 1922, 5, accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?id=126153028215625&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=126153028215625&view=mjp_object).

<sup>275</sup> Dr. William Welch cited in “Notes on Scribner’s Authors,” *Scribner’s* 27, no. 6, December 1922, 5, accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?id=126153028215625&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=126153028215625&view=mjp_object).

<sup>276</sup> “Review,” *Journal of Social Forces* 2, no. 5 (November 1924):784.

<sup>277</sup> “From Immigrant to Inventor,” *The Bemidji Daily Pioneer*, August 28, 1922, 4, accessed September 5, 2011, <http://chroniclingamerica.loc.gov/lccn/sn86063381/1922-08-28/ed-1/seq->



The book was also considered useful to the immigrant. *The Washington Post*'s review considered the autobiography to reveal to the immigrant "the opportunity for science and educational program". "This is one of the few stories of the immigrant pathway to fame through higher education, an inspiration not only to those who come as eager strangers to our gates, but to native-born boys and young men as well."<sup>278</sup>

Thus, the common features of *From Immigrant to Inventor* as reviewed both by Americans and Crnjanski were in the stress that citizens of their respective countries could stand to benefit from reading the book, and were thus urged to, as the book was an inspiring story of how to achieve success from humble beginnings and highlighted the best aspects of both respective cultures. The best aspect of America, as put forward by the press, was it being the land of opportunities; the best aspect of Serbia, as outlined by Crnjanski, was in folk wisdom and know-how and virtues such as diligence, humility, and serenity.

That said, there are two articles that defy the above stereotypes. Henry B. Fuller's *New York Times* 1923 review takes quite a contrarian view. That Pupin achieved success was testimony to the United States, as "such a career is only possible in America". Fuller saw Pupin's career as lying somewhere between his "peasant" hometown and "handsome" Houston Valley residence. He compares America's "light and thin" atmosphere, in contrast to "another air which was densely traditional". Similarly, Kenneth M. Gould in *The Bookman* focuses on the Pupin's differences from the average American. "This Freudian itch for self revelation seems to attack with special malignancy the successful immigrant, and perhaps not without warrant," the review begins. However, it is precisely the "mutual impact of two diverse cultural traditions that renders incandescent elements invisible in either alone." To this reviewer's mind, the best passages are the descriptions of Idvor "and his early struggles in the new world." He agrees with Fuller that coming to America was part of Pupin's success: he "had the fundamentally American virtues of industry, optimism, individualism, nationalism, and adaptability." It helped that he had "the profitable faculty of getting acquainted with 'the best people'".<sup>279</sup>

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4/;words=Michael+Pupin?date1=1836&rows=20&searchType=basic&state=&date2=1922&proxtext=michael+pupin+&y=10&x=9&dateFilterType=yearRange&index=3.

<sup>278</sup> "From Immigrant to Inventor," *The Washington Post*, September 6, 1925, 959.

<sup>279</sup> Kenneth M. Gould, "Scientific Idealism," *The Bookman*, December 1923, 477, accessed January 25, 2011, <http://www.unz.org/Pub/Bookman-1923dec-00477> 477.

While Fuller admits Pupin was an idealizer, he was “shy and strange” and mentions too freely the names of those well-off Columbia students he helped tutor. “He was elected class president over descendents (to continue the free mention of names) Livingston Jay and De Witt... a triumph to confirm the winner in his admiration of the spirit of Western democracy”.

Where Fuller agrees with the multitude of his contemporary reviewers, Pupin was an idealist, particularly in science possessing, “richness of... imagination”. He views him similar to Tesla in entering “readily within the penumbra of the emotional and the idealistic... By comparison... Westinghouse and Edison are... plain, prosaic”. As for Pupin’s idealism in science meaning bringing man closer to divinity and the eternal truth, Fuller writes, “Perhaps. But just as the perfection of America may require some shading, so the great services to be expected from science may have their limitations.”<sup>280</sup> Gould addresses the same themes. “While the poetry of science radiates from his pages, his style has few flashes of the creative act,” he writes, thus it is possible to say that even in more critical reviews of *From Immigrant to Inventor*, it is still acknowledged that he writes about science poetically. As for his scientific ideals, and how he compares to the great American scientific industrialists: “In an age where technology is in the saddle and the plaudits of the crowd go to the Edisons and the Bells—while the men whose patient digging out of theoretical mathematics, mechanics, and electricity was the essential prelude to get the inventions are forgotten—Pupin still holds aloft the banner of truth for truth’s sake.”<sup>281</sup> Gould is more receptive to Pupin’s ideals in science than is Fuller, agreeing that the NRC “gives hope: before long society will share in surplus of ‘pure’ research. For his sturdy championship of that ideal, Michael Pupin deserves his peace among the immortals.”<sup>282</sup>

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<sup>280</sup> Henry B. Fuller, “Professor Pupin Becomes an American,” *The New York Times*, October 14, 1923, 2 and 12.

<sup>281</sup> Gould, “Scientific Idealism.”

<sup>282</sup> Ibid.

## 2. Topical Crossroads: The Periodical and Dissemination

The title of this section serves two purposes. Primarily, it is to draw attention to the limited aspect of the crossroads, which is a merging of some roads, not all roads. The importance of an awareness of limitations is crucial to this work, especially in response to the zeitgeist of the historical period in question, when it was argued, as it still is in some circles, that mankind could come to know all things through Baconian empiricism. A positive result of postmodernism is its critical stance even if it stems from distrust of there ever being a single conclusive answer to any terrestrial questions. This is perhaps best illustrated by Paul de Man's ultimate assessment of the use of New Criticism (which we saw earlier to have emerged in part from Barthes' *Death of the Author*) in his paper "The Return to Philology" in which he advocates close reading, and advises that students make use of their bafflement and "not hide their non-understanding behind the screen of received ideas that often passes, in literary instruction, for humanistic knowledge".<sup>283</sup> A negative outcome of the same is the distrust of the ideal, which, though by its nature is limitless, still has limitations in terms of how it is reached by man's limited mind. Arnold has shown in *Culture and Anarchy* that no ideals are to be taken for granted: the moment that happens, they become machines and fail to provide us with the idea of perfection.

Of the stories that can be told about history, many can be told of specific places and times. While this is a commonplace for many, the fact is that decades after Bakhtin wrote of the battleground of language, often controlled by a master narrative, the media continues to do just that, and Said has shown that the mainstream narrative may insidiously penetrate the academy of higher learning.<sup>284</sup> This is why this point is made explicit here.

This work can only aspire to be one story of Pupin and his autobiography, one cognitive mapping of the context that shaped him and to which he responded. Some topics may be considered to take up too much or too little space in this narrative; some topics

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<sup>283</sup> Paul de Man, "The Return to Philology," accessed 16 May 2012, <http://languageolog.ldc.upenn.edu/myl/deManReturnToPhilology.pdf>.

<sup>284</sup> Edward Said, "Opponents, Audiences, Constituencies and Community," in *The Anti-Aesthetic*, ed. Hal Foster, (Port Townsend, Washington: Bay Press, 1983), 135-159.

deemed important by some may not be covered at all. The sources and materials considered here make up just one of the possible stories, but will hopefully inspire more.

The second purpose of the title is to draw attention to the cross-fertilization between the sciences and humanities so characteristic of the Victorian age. This multi-disciplinary approach to various topics can be seen with particular clarity in the periodical.

For it must be noted that only at the time of Pupin's birth were the conditions of publishing becoming more favourable: in the 1850's printing costs were, due to lowered taxes, low enough to distribute texts to larger audiences.<sup>285</sup> Several periodicals emerged that promoted the works of many of their contributing authors. For instance, the periodical *Cornhill Magazine* promoted the works of, among others, George Eliot.<sup>286</sup> A parallel in terms of shorter press runs and direct purveyance to a reading audience can be seen in how Mark Twain made his name through the periodical *The Atlantic*, and later found a reading audience not through regular book sales, but through door-to-door sales, using sample pages of his books. The periodical contributed to the popularization of many more writers, including the poet Tennyson—who was vocally opposed to the periodical and yet benefitted from the resulting dissemination.<sup>287</sup>

As for the transference of certain trends from Britain to the US, the view taken here is that the periodical continued to play a role in popularising the works of many eminent authors in the US well into the 1920's, past the age of similar dissemination in Britain. An American equivalent of English periodicals like Dickens' *All the Year Round* and *Household Words*, *Scribner's Magazine*, is the periodical that will be focused on here, arguably playing a significant public role from its founding in 1887 until its print run ended in 1939. The periodical culture predates the American periodicals and Dickens' weeklies that will be examined here, and includes *The Eclectic Magazine* (1805-1868), *Blackwood's Magazine* (1817- 1980), *The Literary Gazette*, and *Journal of Belles Lettres, Arts, Sciences, Etc.* (1817-1863), the *Westminster Review* (1824-1914), and *The London Magazine's* second incarnation beginning in 1820 and lasting nine years.

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<sup>285</sup> Phillip V. Allingham, "The Economic Basis of the Radical Expansion of Victorian Periodicals," *Victorian Web*, accessed September 5, 2011, <http://www.victorianweb.org/periodicals/economics1.html>.

<sup>286</sup> Ibid.

<sup>287</sup> Kathryn Ledbetter, *Tennyson and Victorian Periodicals* (London: Ashgate, 2007), 5.

A hint that the periodical is a sign of the Victorian imagination is given in Poe's "The Philosophy of Furniture", appearing in a US magazine in 1840.<sup>288</sup> The essay picked up on Dickens' gibe at Americans for taking a philosophical view of any manner of topics. As we saw earlier, the 19<sup>th</sup> century public sought to be educated on "just about anything": "The English, also, we know from Thomas Love Peacock's satirical novels, were addicted to the lecture. The great French encyclopedia, its imitators, and *the periodical press had done their work*, and audiences were eager to hear anybody on any subject. Crowds attended the lectures of Louis Agassiz on zoology and geology...; of Emerson, of transcendentalists, utopians, home-grown scientists..."<sup>289</sup> Among other things, "Furniture" exemplifies a trend in the esoteric, as demonstrated in the eclectic art of the ideal room. The importance of such themes is represented by the fact that they appeared again in another of Poe's volumes, *Tales of the Grotesque and Arabesque*.<sup>290</sup>

Poe's essay signals us to the Romantic education the public would obtain through reading books and attending lectures. The modes of communication, of which the periodical was a major part, were as interconnected as the themes they addressed. Thus, we are further reminded of the arbitrary lines drawn to approach the Victorian age 'scientifically'—arbitrary because the age was perhaps not as strictly 'scientific' as it seems today.

*Scribner's* could be described as Victorian in terms of the juxtaposition of Romantic and idealized texts alongside those demonstrative of the realism that depicted society as it was: the texts assembled ranged from accounts by Russian princesses on the political state of the country, to travel writings by Theodore Roosevelt, to educationist tracts, to idealism in science (not only Pupin's). And we are wont to remember that Pupin's autobiography first appeared in *Scribner's*, which popularized authors like Conan Doyle, Edith Wharton, F. Scott Fitzgerald, Stephen Crane and Rudyard Kipling, to list a few. In its earlier incarnation, it was the first mainstream magazine to recognize Walt Whitman as a major poet. Its readership ranged between 70,000 and 215,000 until 1930, when readership

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<sup>288</sup> *Burton's Gentleman's Magazine*, May 1840.

<sup>289</sup> Davenport, *Geography*, 5. Emphasis added.

<sup>290</sup> *Ibid.*, 6.

declined.<sup>291</sup> By comparison, Dickens' *Household Words* is estimated to have had a circulation of 38,500, its initial numbers being around 100,000,<sup>292</sup> and his *All the Year Round*, a circulation of 100,000.<sup>293</sup> The *Atlantic Monthly* is said to have had a circulation of 30,000 in 1859,<sup>294</sup> and *Harper's Monthly*, is said to have had 50,000.<sup>295</sup>

There were other magazines in circulation at the time, the two most noteworthy in the US in the latter half of the 19<sup>th</sup> century being *Harper's Monthly* and the *Atlantic Monthly*. The former was the forum for the first public appearance of *Moby Dick*, and featured commentary by Winston Churchill and Woodrow Wilson, with whom Pupin worked, if not in person, at the Paris Peace Conference. It also kept abreast of Thomas Edison's latest discoveries. It is still in print and for many decades was edited by Lewis H. Lapham, who seems to have inherited something of the polymathy of Victorianism in his current, eponymous periodical, *Lapham's Quarterly*. The *Atlantic Monthly* also remains in publication, and in its early decades published important literary texts, as well as those of cross-disciplinary interest, such as William Parker's slave narrative and Charles Eliot's "The New Education". It is perhaps most significant that the founders of this magazine were prominent writers – including Harriet Beecher Stowe, who Pupin mentions prominently in his autobiography as the author of one of the books that introduced him to America (*Uncle Tom's Cabin*); Ralph Waldo Emerson; Henry Wadsworth Longfellow; poet and physician Oliver Wendell Holmes; fireside poet John Greenleaf Whittier; and diplomat-poet James Russell Lowell.

The precedent of these publications can be found in their earlier British counterparts: *All the Year Round*; *The Art-Journal*; *Blackwood's Edinburgh Magazine*; *Cornhill Magazine*; *The Examiner*; *Household Words*; *The Illustrated London News*; *Pall*

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<sup>291</sup> "Charles Scribner's Sons: An Illustrated Chronology," Princeton University Library, accessed September 5, 2011, <http://library.princeton.edu/libraries/firestone/rbsc/aids/scribner/index.html>, "Scribner's," *St. James Encyclopedia of Popular Culture*, accessed August 28, 2009, [www.bookrags.com/research/scribners-sjpc-04/](http://www.bookrags.com/research/scribners-sjpc-04/).

<sup>292</sup> Phillip V. Allingham, "Household Words," *Victorian Web*, accessed September 5, 2011, <http://www.victorianweb.org/periodicals/hw.html>.

<sup>293</sup> Phillip V. Allingham, "All the Year Round," *Victorian Web*, accessed September 5, 2011, <http://www.victorianweb.org/periodicals/ayr.html>.

<sup>294</sup> Cullen Murphy, "A History of The Atlantic Monthly," *The Atlantic*, accessed September 5, 2011, <http://www.theatlantic.com/past/docs/about/atlhstf.htm>.

<sup>295</sup> "About Harper's Magazine," *Harper's*, accessed September 5, 2011, <http://harpers.org/harpers/about>.

*Mall Gazette; Punch; Westminster Review* to list a few.<sup>296</sup> These publications also propagated broad and idealistic content wherein the poetic scientific narrative is part and parcel of education ideals and a general wish to understand life and humanity better. The wish to understand humanity was a by-product of scientific advancement: there was hope that one could understand even one's emotional life better – as demonstrated most compellingly in George Eliot's *Middlemarch*.<sup>297</sup> Science even crept into the less universal publication edited for a short time by Oscar Wilde, *Woman's World*,<sup>298</sup> which is a tribute both to the effective popularization of science in print media and to the broad reach of even narrow publications. The other key trend most obviously underlined by the focus on the periodical is the importance of writing in expressing these new views.

As this section is not a review of Victorian periodicals, but rather what the relationship is between the periodical and Pupin's autobiography, which was written in an English-language periodical hence the focus on such here, the periodicals that will be considered in most detail here will be *Scribner's*—the context of Pupin's autobiographical installments, and the earlier precedents overseen by Dickens—representative of a conscientious effort and founded with the goal to popularize science, alongside or through other literary and intellectual pursuits.

## 2. 1. The popularization and idealization of science through the periodical

*Household Words* officially got its name from a line in Shakespeare's *Henry V*: "Familiar in his mouth as household words",<sup>299</sup> though it is hard to escape noticing the association with the Grimm brothers' *Household Children's Tales*. The "Preliminary Word" in the first

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<sup>296</sup> George P. Landow, "Victorian Periodicals," *Victorian Web*, accessed September 5, 2011, <http://www.victorianweb.org/periodicals/index.html>.

<sup>297</sup> Michael Rectenwald, "The Construction and Deconstruction of Science in *Middlemarch*," *Victorian Web*, accessed September 5, 2011, <http://www.victorianweb.org/authors/eliot/middlemarch/rectenwald2.html>.

<sup>298</sup> Oscar Wilde, ed., *The Woman's World*, 1888, 41, 54, 58, 134, 180, 202, 281, 337, accessed September 5, 2011, <http://www.archive.org/stream/womansworld00wildgoog#page/n55/mode/1up/search/science>.

<sup>299</sup> William Shakespeare, *Henry V*, 4.3.52, accessed September 5, 2011, <http://shakespeare.mit.edu/henryv/full.html>.

issue elaborated what was to become familiar to readers of “both sexes, and of all ages and conditions”. The periodical sought “to show to all, that in all familiar things, even those which are repellant on the surface, there is Romance enough, if we find it out.”<sup>300</sup> The periodical dealt with social matters, was informational, and a source of entertainment.<sup>301</sup> However, as Nancy Metz argues in her essay, “Science in Household Words: The Poetic... Passed into Our Common Life”, those articles that dealt with science in that periodical were of particular importance.<sup>302</sup>

According to Metz, not only was the role of science in *Household Words* a “master problem solver” (which Dickens also deals with ironically in works like *Pickwick Papers*)<sup>303</sup> but also as a “servant contributing to optimistic progress; educator, interpreter, technician of the modern industrial world; a time partner of the creative artist.” It was to improve man’s character and morality, and thanks to it, happiness would be increased, ignorance destroyed, and along with ignorance, prejudice and superstition.<sup>304</sup> Hence the connections to romantic idealism mentioned previously.

Dickens in *Household Words* begins to mythologize the scientist: “his interest in science was that of an artist fashioning a new mythology”.<sup>305</sup> It is easy to see the outlines of this myth being extended to scientists like Tesla or Edison. According to Dickens, “art and science have been brought to bear upon things before thought worthless; ... the refuse of the smith, the gas-works, and the slaughter-house, have been made to yield products the most valuable.” The scientist was “part wizard, part visionary, ... gifted with the power to look at what was, in fact, visible to all, yet to do so with eyes sensitive to the complex wonder of life.”<sup>306</sup>

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<sup>300</sup> Charles Dickens, “A Preliminary Word,” *Household Words* 1, March 30, 1850, accessed September 5, 2011, <http://www.djo.org.uk/household-words/volume-i.html>.

<sup>301</sup> Allingham, “Household.”

<sup>302</sup> Nancy A. Metz, “Science in Household Words: The Poetic... Passed into Our Common Life,” *Victorian Periodicals Newsletter* 41 (November 4, 1978): 121-133, accessed September 5, 2011, <http://www.jstor.org/stable/20085205>.

<sup>303</sup> William R. Terpening, “Satire and Science in the First ‘Information Age’,” *Victorian Web*, accessed September 5, 2011, <http://www.victorianweb.org/authors/dickens/pickwick/wrt1.html>. Dickens’ works will be shorthand here by their acronyms, as per standard practice.

<sup>304</sup> Metz, “Science,” 123-4.

<sup>305</sup> *Ibid.*, 128.

<sup>306</sup> *Ibid.*, 125.



Metz argues that Dickens represented the artistic process in scientific terms. Like the scientist, the artist was to see the world afresh, freed of old associations.<sup>307</sup> “Dickens was interested in the philosophical borders of modern science: the sense of science as metaphorical, conditional, imaginative play of grand dimensions in which the player recognizes himself as part of the game.”<sup>308</sup> Science, like art, is fundamentally metaphorical, but is a provisional metaphor: knowledge is bound by the limits of the metaphor that makes it possible for us to see the world in a different light.<sup>309</sup>

However, it was such claims that led some, like Peacock, to amused contempt towards the scientist: he considered it an attack leveled at the spirit, promoting “solid, conducive studies” and “the progress of useful arts and science” while withdrawing man’s attention from poetry.<sup>310</sup> Indeed, scientific revelations seem to have the upper hand over the arts. They had the authority to confirm and restate the truths that the artist “had long since discovered in another language”.<sup>311</sup>

Scientific method was seen—though some thought mistakenly—as a way to live constructively in a complex world.<sup>312</sup> “Science, whose aim and end is to prove the harmony and ‘eternal fitness of things’ also proves that we live in a world of paradoxes; and that existence in itself is a whirl of contradictions. Light and darkness, truth and falsehood... are evidences of all-pervading antithesis which... neutralize each other’s powers when they come into collision.”<sup>313</sup> On the whole, the general tone of the periodical reveals the beauty in ugliness and at once infusing this scientific approach with a language that was, “decidedly rhetorical and fanciful. Inspired by (or perhaps consciously emulating) Dickens, contributors used figure rather than journalistic language, employing frequently such devices as personification, contrived conversation, exaggeration and distortion.” Even reportage and social commentary utilized “‘fantasy, vision, fable, imaginary travels... and

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<sup>307</sup> Metz, “Science,” 126.

<sup>308</sup> Ibid., 127.

<sup>309</sup> Ibid., 128.

<sup>310</sup> From a letter quoted in the introduction to *The Four Ages of Poetry, Shelley’s Defense of Poetry, Browning’s Essay on Shelley*, ed. H.F. Brett-Smith, Boston (New York: Houghton Mifflin Co., 1921), accessed September 5, 2011, [archive.org/stream/peacocksfourage00browgoog/peacocksfourage00browgoog\\_djvu.txt](http://archive.org/stream/peacocksfourage00browgoog/peacocksfourage00browgoog_djvu.txt).

<sup>311</sup> Metz, “Science,” 129.

<sup>312</sup> Ibid., 131.

<sup>313</sup> Ibid., 128.

the use of fictitious characters to serve as mouthpieces of information and opinion.”<sup>314</sup> The first few numbers of *Household Words* champion popular entertainment, such as melodrama: so that while the accumulation of scientific facts is necessary, they do not ultimately engender affectivities.<sup>315</sup> “There is a range of imagination in most of us, which no amount of steam engines will satisfy,” Dickens writes in the “Preliminary Word”.<sup>316</sup> He continues, “No mere utilitarian spirit, no iron binding of the mind to grim realities, will give a harsh tone to our Household Words. In the bosoms of the young and old... we would tenderly cherish that light of Fancy which is inherent in the human breast... To show to all, that, in all familiar things, even in those which are repellent on the surface, there is Romance enough, if we will find it out: – to teach the hardest workers at this whirling wheel of toil, that theirs is not necessarily a moody, brutal fact, excluded from the sympathies and graces of imagination... is the one main object of Household Words.”<sup>317</sup>

A beautiful example of the romance in industrial toil is the phrase: “The Slaves of the Lamp of Knowledge have their 1001 tales”.<sup>318</sup> Writers become intermediaries, allowing the public to figure out the new developments of science with the help of a guide.<sup>319</sup> Thus, established in *Household Words* is the mythologized scientific approach, framed in poetic rhetoric.

This approach continues in the periodical into which Dickens incorporated *Household Words*, after a falling out with the latter’s publishers. This was *All the Year Round*, again with a reference to Shakespeare, though now displayed before the title, and inspiring the title, from Othello, “The story of our lives, from year to year.”<sup>320</sup> *All The Year Round* contained more fiction (promoting novelists) and less journalism than *Household*

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<sup>314</sup> Anne Lohrli, *Household Words: A Weekly Journal 1850-1859 Conducted by Charles Dickens*, (Toronto: University of Toronto Press, 1973), 9.

<sup>315</sup> Ben Winyard and Holly Furneaux, “Dickens, Science and the Victorian Literary Imagination,” 19: *Interdisciplinary Studies in the Long 19<sup>th</sup> Century* 10 (2010), accessed September 5, 2011, [www.19.bbk.ac.uk/index.php/19/article/download/572/514](http://www.19.bbk.ac.uk/index.php/19/article/download/572/514).

<sup>316</sup> Qtd. in Winyard and Furneaux. “Dickens, Science”: Charles Dickens, “A Preliminary Word,” *Household Words*, March 30, 1850.

<sup>317</sup> Ibid.

<sup>318</sup> Qtd. in Elaine Ostry, “Social Wonders: Fancy, Science and Dickens’ Periodicals,” *Victorian Periodicals Review* 34, no. 1, (Spring 2001): 56, accessed August 6, 2012, <http://www.jstor.org/stable/20083778>.

<sup>319</sup> Ostry, “Social Wonders,” 59.

<sup>320</sup> William Shakespeare, *Othello*, 1.3.128-129, accessed September 5, 2012, <http://shakespeare.mit.edu/othello/full.html>.

*Words*. Sales were boosted through the fiction installments, which often took up a great portion of the journal<sup>321</sup>—that said, it may have been more conscientiously devoted to science: “Wonders have been accomplished, and with them, the poetic has passed into our common life”,<sup>322</sup> Dickens writes of technology. The founding announcement explains that he has strived for, “That fusion of the graces of the imagination with the realities of life, which is vital to the welfare of any community...”<sup>323</sup> He continued to follow up on the developments in science, including Darwin’s theories, as well as the lives and struggles of inventors, a format found in a later edition of *Harper’s Monthly*, in George Lathrop’s “Talks with Edison.”<sup>324</sup> It is argued that with the help of Dickens periodicals, and through his poetical rhetoric approach to science, its poetry did, indeed, pass into our daily life. The smelly locomotive became a thing of beauty, to be admired, to be honoured for the progress it enabled.

This theme is framed rather interestingly in “Small Beer Chronicles”, a relatively long series of satirical essays, meant to test and sample the goings-on of the age ignored by other publications. While the byline of the articles went to Charles Allston Collins, it is speculated that they were penned by or heavily edited by Dickens.<sup>325</sup> Each article began with analogies between microbrewing and social matters—a study in science, if sometimes vicious in its analysis.<sup>326</sup> The theme of the aesthetic in the technological returns: “and who shall say that this age of machinery and steel is without its appeal to the imagination and our sense of the beautiful”.<sup>327</sup> Dickens was vocal about there being a changing aesthetics, though it must be stressed again that these views as they appear here are masked in satire—quite in contrast to later revelry in the technological by writers such as Apollinaire,

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<sup>321</sup> Allingham, “All the Year”.

<sup>322</sup> Charles Dickens, *All the Year Round* 18, September 14, 1867, 279, accessed September 5, 2011, <http://www.djo.org.uk/all-the-year-round/volume-xviii/page-279.html>.

<sup>323</sup> Qtd. in Ostry, “Social Wonders,” 56.

<sup>324</sup> George Parsons Lathrop, “Talks with Edison,” *Harpers Monthly*, February 1890, 425-435, accessed September 5, 2011, <http://digital.library.cornell.edu/cgi/t/text/pageviewer-idx?c=harp;cc=harp;rgn=full%20text;idno=harp0080-3;didno=harp0080-3;view=image;seq=0435;node=harp0080-3%3A10>.

<sup>325</sup> John Drew, “Volume VII Introduction,” *All the Year Round* 7, August 30, 1862, ed. Charles Dickens, accessed September 5, 2012, [www.djo.org.uk/indexes/volumes/1862-volume-vii.html](http://www.djo.org.uk/indexes/volumes/1862-volume-vii.html).

<sup>326</sup> Ibid.

<sup>327</sup> Charles Dickens ed., “Small Beer Chronicles,” *All The Year Round* 7, August 30, 1862, 585, accessed September 5, 2011, <http://archive.org/details/allyearround71charrich>.

Baudelaire, Poe, or the Futurists, Surrealists, and Dadaists. The difference in approaches range from realistic depiction of the new human condition (Balzac, Dickens) to euphoria (D'Annunzio, Mallarmé) to rejection of it (Eliot, Melville, Ruskin).

Writers on science “tended to communicate a strong spirit of optimism for the future and championed the modern world over times past.”<sup>328</sup> In “Small Beer Chronicles,” engineers were compared to “the knight-errants of old”,<sup>329</sup> which is important, as this imagery comes up in Maxwell, as well as in Pupin.<sup>330</sup> Also as important is the description of scientists as “high priests” “who would worship in the temple of wisdom, and seek to extract their secrets from the oracle for the benefit of the congregation”.<sup>331</sup>

The world’s “illusions are over, it is grown up, it has been through romance, it has become practical”<sup>332</sup> reads a “Small Beer Chronicles” column. The view to the future welcomed change as a sign of progress.<sup>333</sup> This aesthetic allowed Turner to see beauty in “the unlikely objects of tug boats and railroads”<sup>334</sup>, though Ruskin’s view of the same is opposite. The “Small Beer Chronicles” column continues, “It may be that when the first shock inseparable from these great changes is over... a new poetry and a new picturesqueness will become developed”<sup>335</sup> though this very scientific poetry “comes to us in rather an ungainly shape, and trampling to pieces the things that we have delighted in for half a lifetime”.<sup>336</sup> Thus, while Dickens and the columnists he engaged distrusted an overly scientific approach, it was fancy that would take the edge off,<sup>337</sup> or a new kind of poetry.

Thus the promotion and idealization of science in the publications Dickens oversaw. By contrast is the publication overseen by a later writer, and Pupin’s contemporary, Wilde, which is said to have informed the latter’s writing by blurring the line between journalism

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<sup>328</sup> Ostry, “Social Wonders,” 64.

<sup>329</sup> Ibid., 65.

<sup>330</sup> For Pupin, see *Immigrant*, 184, 211, 290.

<sup>331</sup> Ostry “Social Wonders,” 65.

<sup>332</sup> Qtd. in *ibid.*, 61.

<sup>333</sup> Ibid., 60.

<sup>334</sup> Ibid.

<sup>335</sup> Ibid., 62.

<sup>336</sup> Ibid., 66.

<sup>337</sup> As argued in *ibid.*

and fiction<sup>338</sup> – again a tribute to Victorian cross-fertilization. *Woman's World*, in the three years of Wilde's stewardship, dealt with science in several ways. Science permeated the works of art and literature reviewed by the magazine, including a poetry collection by E.R. Chapman, whose "A Strong-Minded Woman" has this woman worshiping art (she "drank it like wine") and "knelt to science... vowing to truth to service to the death".<sup>339</sup> Wilde makes reference to Darwin's evolutionism,<sup>340</sup> and his other contributors wrote about how English women should pay attention to what Carlyle termed the "dismal science" to promote national trade through purchasing textiles<sup>341</sup> (echoing a Whewellian view towards economics), and how the contemporary liberal education no longer meant, as it did in the times of their fathers, an education in literature, but in science.<sup>342</sup> Thus was the message directed to educated women, who were looking to take a new place in society.

By contrast, the British science magazine *Nature*, devoted primarily to science, took its name from a poem, and began its opening issue with literary text. One of the magazine's founders, Tyndall, instructed Pupin to read volume VIII. Tyndall was also a member of the X Club, the views of which the magazine espoused. It was partly on the basis of what Pupin read in that periodical that he won a fellowship that brought him to postgraduate studies under Helmholtz in Germany.<sup>343</sup> It is relevant to this section to note that the magazine took its name from a Wordsworth poem, specifically the line: "To the solid ground of Nature trusts the mind which builds for aye."<sup>344</sup> Significantly, in this first issue, too, was the inclusion of the aphorisms of Goethe. No shortage of lofty sentiment abounds: "She has neither language nor discourse, but she creates tongues and hearts, by which she feels and speaks."<sup>345</sup> It is noted that Goethe, himself, was a natural philosopher and had incorrectly

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<sup>338</sup> Kaya Genc, "Wilde in the Office," *LARB*, August 12, 2012, accessed August 12, 2012, [lareviewofbooks.org/article.php?type=&id=835&fulltext=1&media=](http://lareviewofbooks.org/article.php?type=&id=835&fulltext=1&media=).

<sup>339</sup> Wilde, "The Purgatory and Other Poems," *Woman's*, 134.

<sup>340</sup> Wilde, *Woman's*, 180.

<sup>341</sup> Mrs. Johnstone, "April Fashions," *ibid.*, 306.

<sup>342</sup> Julia Wedgewood, "Woman and Democracy," *ibid.*, 363.

<sup>343</sup> Pupin, *Immigrant*, 200-1.

<sup>344</sup> *Nature* 1, November 4, 1869, accessed September 5, 2011, <http://www.nature.com/nature/about/first/>.

<sup>345</sup> *Ibid.*

predicted that his name in science would surpass his name in literature.<sup>346</sup> More will be written about that later.

Suffice it to say for the moment that, besides the literary component in the founding issue, an intriguing feature of the aphorisms is the reference to Nature being “always veiled”—another theme Pupin touches on in his autobiography.<sup>347</sup> That phrase, and, “She rejoices in illusion” both draw on the Isis myth, which Hadot shows continued to retain relevance up to Victorian times, when she was often depicted in manuscript engravings.<sup>348</sup> “We constantly act upon her, yet have no power over her... She broods over an all-comprehending idea, which no searching can find out.” Nature loves to hide—in true Heraclitian fashion. Interestingly, T.H. Huxley’s introduction to the aphorisms disregards these references: “No more fitting preface could be put before a journal, which aims to mirror the progress of that fashioning by Nature of a picture of herself, in the mind of man, which we call the progress of science”. Huxley makes it clear that it is not the aphorisms that are “fitting”, but Goethe’s later comments, over forty years later—in 1828, on his aphorisms, which Huxley quotes from some of Goethe’s correspondence, in which he alters the view he had taken in the aphorisms: “If we consider the high achievements by which all the phenomena of Nature have been gradually linked together in the human mind [since the aphorisms were written]; and then, once more, thoughtfully peruse the above essay[i.e. the aphorisms], from which we started, we shall, not without a smile, compare that comparative, as I called it, with the superlative which we have now reached, and rejoice in the progress of fifty years.”

And regardless of what one’s expectations are of science, it is hard not to feel the curious impact of Huxley’s concluding paragraph about how the science being propagated by the magazine will one day become obsolete, though Goethe’s poetic vision will remain:

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<sup>346</sup> Qtd. in John Tyndall, “Goethe’s Farbenlehre,” *New Fragments* (New York: D. Appleton and Company, 1892), 50, accessed September 5, 2011, <http://archive.org/stream/newfragments002499mbp/newfragments002499mbp#page/n7/mode/2up>.

<sup>347</sup> Pupin, *Immigrant*, 383: “We feel intuitively that science will never penetrate the mysteries beyond it, but our faith encourages us in the belief that there behind the impenetrable veil of this eternal background is the throne of a divine power, the soul of the physical world, the activity of which we contemplate in our research of physical phenomena.”

<sup>348</sup> Pierre Hadot, *The Veil of Isis*, trans. Michael Chase (Cambridge and London: Harvard University Press, 2006).

“When another half-century has passed, curious readers of the back numbers of *NATURE* will probably look on our best, “not without a smile;” and, it may be, that long after the theories of the philosophers whose achievements are recorded in these pages, are obsolete, the vision of the poet will remain as a truthful and efficient symbol of the wonder and the mystery of Nature.”<sup>349</sup> It is an ambiguous beginning, to say the least, perhaps to placate the larger-scope of reading audience they were aiming for. Such is a common argument made in favour of Darwin’s pro-religious views, where they appear. Goethe and Huxley criticize the aphorisms for their pantheistic tone—and it is through such literary examples that the changes in religious views can be seen. Huxley was himself the man who coined the term “agnostic”. More will be written on this later.

The inclusion of aphorisms in a scientific publication underlines the cross-fertilization manifest in periodicals and represents the classical training of *Nature*’s founders, Huxley and Tyndall. This was true of most scientists of the time; in their writing, science is related to the narrations of the senses and to beauty. Tyndall had advised Pupin to read Volume 8 of *Nature*: it could be argued that a romantic poetry lies even in the article titles. For example, in No. 196, they read: “Relics of the Pyramid”, “Mother Earth’s Biography”, “Colour of the Emerald”, and so forth.

*Scribner’s Monthly* was established at around the same time as *Nature* – a year later, in 1870, and addressed the subjects of science, literature, and art (having incorporated the Putnam magazine on those topics). However, it was to the next incarnation of the magazine that Pupin contributed: *Scribner’s Magazine*, which had the aim to compete, as already mentioned, with *Harper’s Magazine* and *Atlantic Monthly*. The magazine ran from 1887 to 1939, with Pupin’s contributions appearing in the September issue of 1922 and every month until the August issue of 1923 (from Volume 72, no. 3 to Volume 74, no. 2). *Scribner’s* bears some interesting comparisons to Dickens’ periodicals: while clearly catering to public appeal (such as, in this case, through elaborate illustrations, or articles like, “Letting Go of A Lady”<sup>350</sup> or “The Gentleman with Plaid Eyes”<sup>351</sup>), there was also an

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<sup>349</sup> T.H. Huxley, “Goethe: Aphorisms on Nature,” *Nature* 1.

<sup>350</sup> W. Edson Smith, *Scribner’s* 72, no. 3, (September 1922), accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?id=1261518915765625&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261518915765625&view=mjp_object).

attempt to raise public awareness on certain issues, and to promote science. However, while there is much enthusiasm in this later American publication, there is not so much of the fancy, nor the saccharine attempt to coat science in a syrupy narrative. In many of the pieces, the authors get straight to the point, and even openly declare goals of the piece: “The Immigration Problem: A Practical American Solution”<sup>352</sup>, or “The Field of Art: Museums and the Factory – Making the Galleries Work for the Art Trades”.<sup>353</sup> Which is not to say that the magazine loses its literary quality: it is hoped that even in the few extracts to follow, the poetic quality of the prose will be apparent.

A *Scribner's* article particularly similar to an installment of Pupin's autobiography appeared in the November 1922 issue of the magazine, “A National Focus of Science and Research”, by George Ellery Hale.<sup>354</sup> This appeared when Pupin was still writing about his arrival in the US—many installments before he wrote of his being an established scientist, and a year before he wrote of his own scientific ideals. Like Pupin would do in the final installments of his autobiography, the author points to the dearth of advanced scientific education in the U.S. and the resulting shortage of experts. Also echoing the last installment or chapter in Pupin's autobiography are the ideals and expectations this author held for the National Research Council: “In all their activities, whether in popularizing science, supplying technical information, ... pointing out new possibilities of progress, ... the Natural Academy and Research Council must always seek to maintain an effective balance between fundamental science and its applications in the arts.”<sup>355</sup> He, like Pupin, argues in favour of the importance of research, especially to corporations,<sup>356</sup> and sees science as possessing a beauty that is found also in literature and art: “Science... was first clearly recognized by the keen vision of the Greeks, only to be lost again in medieval obscurity.

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<sup>351</sup> Rebecca Hopper Eastman, *Scribner's* 72, no. 1 (July 1922), accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?id=1261512795593750&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261512795593750&view=mjp_object).

<sup>352</sup> Roy L. Garis, *Scribner's* 72, no. 3 (September 1922), accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?id=1261518915765625&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261518915765625&view=mjp_object).

<sup>353</sup> Richard F. Bach, “The Field of Art: Museums and the Factory – Making the Galleries Work for the Art Trades,” *Scribner's* 71, no. 6 (June 1922), accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?id=1261509270609375&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261509270609375&view=mjp_object).

<sup>354</sup> George Ellery Hale, “A National Focus of Science and Research,” *Scribner's* 72, (November 1922), no.5, 515-531, accessed September 5, 2011, [http://dl.lib.brown.edu/mjp/render.php?id=1261526028437500&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261526028437500&view=mjp_object).

<sup>355</sup> *Ibid.*, 520.

<sup>356</sup> *Ibid.*, 521.



...science is now held at its true value by all fully enlightened men ... [who recognize] science as the one sure guide to the discovery of truth and as the strongest ally of mankind. Others, who have glimpsed only one of its aspects, see science as the cold embodiment of reason, devoid of the beauties of the imagination that exist for them only in literature and art.”<sup>357</sup> The passage continues in this vein, while depicting the perception of the ancient Greek, arguing that science is to broaden the mind beyond the initial lands and seas from which the primordial man emerged: “The range of his perception has spread from a little area centering in Greece ... to the depths of a universe in which he watches the birth, growth, and decay of worlds incomparably greater than his own. ... But it is not only in the material world that science is useful to mankind. Its greatest aim and object is the discovery of the truth, which it pursues without fear of embarrassing consequences. Science sets before us a high example of honest judgment and an open mind, reversing its conclusions without hesitation when new evidence demands.”<sup>358</sup>

And earlier on the same page, he writes that man “must be blind indeed if he fails to recognize the services of science to civilization.” The passage is reminiscent of Pupin’s work in the references to classical Greece, poetic gesture, ideal notions of truth, beauty of scientific inquiry, and structuring of the modern myth or views of science using narrative as a means to convey it.

The article rivals Pupin’s autobiography in terms of the literary flair it brings to science (we remember that in the very first pages of Pupin’s work, he quotes Lyermontoff and writes of how the poetry of science nourishes the spiritual body of man)<sup>359</sup>: “Science does not seek a formula with which to reproduce the sculpture of Praxiteles or Rodin, the paintings of Rembrandt or Turner, the poetry of Homer or Keats. It recognizes here, as it does in true religion, a domain beyond its own. But its appeal is to the imagination as well as to the reason. The painter, with common pigments and bristle brushes, creates on canvas a great portrait or landscape. ... Science, revealing with its instruments of metal and glass the widest sweep of nature, inspires the imagination by vistas of the stellar universe, the exquisite life of the microscopic world, the successive stages in the evolution of the earth

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<sup>357</sup> Hale, “A National Focus,” 521.

<sup>358</sup> Ibid., 522.

<sup>359</sup> Pupin, *Immigrant*, 18, 102.

and of man. No material service of science to daily life... can compare in value with its overthrow of earth-centered medievalism and its revelation of the universe.”<sup>360</sup>

The comparison of science to art was a Victorian platitude. The author elevates the American Association for the Advancement of Science and the National Academy of Sciences above Plato’s Academy and the School of Alexandria, as well as Arab science, which, because of “concentration on particular problems”, develop “narrowness of view, and the isolated worker, his whole heart and soul locked within a closely bound field, fails to see clearly the vast territory lying beyond his own.” The author calls for specialists who have a view for “a broad appreciation of the major problems of science.”<sup>361</sup> Pupin, too, raises the official US scientific bodies to new heights at the end of his installments, he, too, connects science to emotion (“his whole heart and soul”), and urges for specialization in science.

But, as stated before, *Scribner’s Magazine* was not only about scientific narrative, but a wide range of subjects, ranging from the popular to the literary to the cultural. An example of the bridge between these themes is the article entitled, “Friction in Education” in which it is stated, “Energy is the ability to do work. Friction in machinery causes loss in the results of energy... must a boy dislike his schoolwork and so waste output?”<sup>362</sup> The observations are noteworthy both in terms of the scientific being used as an authoritative subject for comparison (thus implying the importance of the scientific view), and in terms of the expectation that all things, children included, be approached in a way so as to maximize output. Thence the reasons earlier writers like Ruskin or Arnold were wary of things “mechanical”.

Another article that appeared in *Scribner’s* at the same time as Pupin’s autobiographical installments, is “The Still Small Voice of Russia”,<sup>363</sup> which testifies to there being a literary meeting point for various cultures in the print of the periodical.

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<sup>360</sup> Hale, “A National Focus,” 523.

<sup>361</sup> Ibid., 524.

<sup>362</sup> Karl S. Wells, “Friction in Education,” *Scribner’s* 72, no.2 (August 1922), accessed August 6, 2012, [http://dl.lib.brown.edu/mjp/render.php?id=1261515784250000&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261515784250000&view=mjp_object).

<sup>363</sup> Julia Cantacuzene Grant Speransky, “The Still Small Voice of Russia,” *Scribner’s* 71, no.1 (January 1922), accessed August 6, 2012, [http://dl.lib.brown.edu/mjp/render.php?id=1261494099265625&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261494099265625&view=mjp_object).

Written by Princess Speransky, another form of idealism is addressed through the lens of culture. “At this time there are Red propagandists paid to shoot on the housetops of a false Utopia, in that land where their companions in crime are grinding a nation under heel, while they lie about it to us, talking of idealism misunderstood.”<sup>364</sup> It is a troubling account, “From Russia has come to me direct a still small voice with no press agent in attendance... stories that have to have names, geography, and time changed for safety.” Communist Russia is depicted as what perhaps some readers would consider as the inversion of America: ideals turned on their heads, a Darwinistic nightmare: “Dear friend, did we ever think what a struggle for life was reserved for us, without any preparation to face it, and that we should have to prove by ourselves Darwin’s theory?”<sup>365</sup> In this respect, this article is the antipode of Pupin’s cultural vision, which is filled with a ‘best of’ selection of cultural traits. It differs, except on one point: that of what could be described as Slavic spiritualism, about which even Kristeva has written.<sup>366</sup> Speransky writes, “These people, who in silence bore material destitution, even starvation, still rise to the touch of spiritual things!”<sup>367</sup> Pupin, who laughingly referred to himself as a “goose in a fog” before Tyndall, was explicit in his autobiography about the highest place that should be given to spiritual value.

The antidote to Slavic influence is given in another article, “The Human Touch and the Librarian”. The author, a librarian and “authority” on the Slav immigrant, prides herself on her human touch—exercised in “one of our favorite indoor sports” to not let the demanding man on to the fact that the librarian does not recognize him.<sup>368</sup> She describes how among other duties, is the cultivation of the social component: “This is, to my mind, the finest kind of Americanization work, since it will bring these foreign-born men into contact with a representative fine American on the basis of common interest; and it pleases me most that they [the Slavs] are to be the ones to inform him [of Slavic references only the

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<sup>364</sup> Cantacuzene, “The Still Small Voice,” 3.

<sup>365</sup> Ibid., 11.

<sup>366</sup> Kristeva, *Crisis*, 150.

<sup>367</sup> Cantacuzene, “The Still Small Voice,” 15.

<sup>368</sup> Eleanor Ledbetter, “The Human Touch and the Librarian,” *Scribner’s* 72, no. 4 (October 1922), 452, accessed August 6, 2012, [http://dl.lib.brown.edu/mjp/render.php?id=126152192962500&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=126152192962500&view=mjp_object).

Slav could know]. It is seldom they get this chance, although they have plenty to tell that the native American could well afford to learn.<sup>369</sup>

It is this open-mindedness that seems to underline the breadth of interest among some of the better-educated circles in America at that time, even when tempered with Western-centrism, it remains open to other narratives. How else could Pupin have fostered such a large reading audience? By comparison, Edith Wharton was of the opinion that Dostoevsky's characters were incomprehensible, and feels no need to present justification as to why this was so, rather voicing a preference for the Russian character to be 'translated' into a Western component.<sup>370</sup> As a result, it could be surmised that successful narratives from other cultures were to be 'bilingual'—fluent in both the home culture and the adopted one, as was Pupin—and even Isaiah Berlin. This is forwarded as one part of the definition of the possibility for there to be inter-cultural relations.

In the next episode, the librarian helps a Serb obtain justice in a situation involving a corrupt saloon-keeper with Bolshevik ties. The librarian ends by stating that she considers herself a social worker: "Who establishes more social contracts than I do?"<sup>371</sup>

A similar tamed multicultural line is taken in "The Immigration Problem", in which the author argues for the "Americanization of those aliens now here, and to save America for Americans without doing injustice to ... those who may desire to come to us in the future."<sup>372</sup>

But that all such problems of abode—perhaps even of the heart—can be regulated by the new fields of science, put in a belletristic way, is summed up neatly in another article: "What am I? Certainly all that biology, physics, chemical and mechanics show that I am... Yet I am not merely any one or all of these. I am the organization of all of them ... I am a hierarchy" at the top of which is a oneness. "Qualitative 'newness' and 'oneness' go

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<sup>369</sup> Ledbetter, "Human," 453.

<sup>370</sup> Edith Wharton, introduction to *Futility*, by William Gerhardie, (New York: Melville House Press, 2012), accessed August 6, 2012, <http://mhpbooks.com/the-strong-beat-of-life-by-edith-wharton/>.

<sup>371</sup> Ledbetter, "Human," 454.

<sup>372</sup> Roy, *Scribner's*, 367.

together.”<sup>373</sup> And, “this ‘newness in the case of the ‘I’ that ultimately emerges as a result of organization, [puts] this ‘I’ into a realm of fact that the sciences cannot and do not deal with at all—a realm that is ethical the aesthetic, and the rational”.<sup>374</sup> Thence, the moral, classical great chain of being, expressed scientifically. “I conclude, then, that it is to literature, art, ethics, religion, and philosophy that one must turn if one would find what the personality is.”<sup>375</sup> Pupin takes a similar line in his autobiography, such as when he writes that the terminals of physical fact are anchored in the consciousness and have an “origin that may be traced to the life-giving breath of some heavenly bridegroom” and along the path between these terminals may be discovered “those beauties which continually thrill the heart”<sup>376</sup>, and the article sums up the scope of the magazine: even in an article on science, one can find the arts.

What can be seen in the periodical is the popularization of science and its ideals; the modern-day myths in science; notions of progress—and its occasional associations with fear necessitating guides; ideals in education; and ideals (as opposed to today’s jaded stance) towards the concept of nation. While all of these themes can be termed Victorian, romantic, realist, it is relevant that they were addressed in the popular media of the time. These themes will be developed further in the following chapters.

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<sup>373</sup> Edward G. Spaulding, “What Am I?,” *Scribner’s* 71, no. 1, (January 1922), accessed August 6, 2012, [http://dl.lib.brown.edu/mjp/render.php?id=1261494099265625&view=mjp\\_object](http://dl.lib.brown.edu/mjp/render.php?id=1261494099265625&view=mjp_object).

<sup>374</sup> *Ibid.*, 51.

<sup>375</sup> *Ibid.*, 52.

<sup>376</sup> Pupin, *Immigrant*, 379.

### 3. Literature and Science: Convergences and Divergences

It has been established that especially for those whose interest it was to popularize science, literary work and science writing was often one and the same—ranging from Lucretius’ poem about nature to Marcet’s scientific explanations conveyed in narrative dialogue. Points of contention emerge with the question of where one begins and the other ends, as well as the question of their respective ideals, or ideals in general. Distinctions are blurred where history and myth combine, such as in Herodotus’ accounts of sea monsters, or the science or history appearing in myth or narrative—like the precedent to Archimedes’ cattle-problem in Homer’s *Odyssey*; where history is made into myth—like the exaggerated accounts pertaining to Galileo; where scientific discussion makes use of rhetorical figures and genres like parables or dialogue—like the question of the accuracy of Plato’s depiction of Socrates in his dialogues. Such ambiguity, however, is harder to find in Plato, where both language and science are to serve the same end of health (rhetoric is to make the soul wish for virtue)<sup>377</sup> and where both are to serve truth,<sup>378</sup> not opinion.<sup>379</sup> In *Cratylus*, Socrates advises that the beginning of any undertaking is most important, for everything else will follow only if the foundation is right, i.e., “if names are really consistent.”<sup>380</sup> The importance of naming or definition is perhaps why science is so fundamentally, and essentially, connected to language.

It has already been stated how Pupin viewed science as a language, which is not a new view. Stemming from Pythagoreansim, it was assumed that the book of nature was written in the language of mathematics. Interestingly, even Lucretius considered the

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<sup>377</sup> Plato, *Phaedrus*, translated by Harold N. Fowler (Cambridge: Harvard University Press, 1925), accessed on September 7 2012,

<http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.01.0174:text=Phaedrus, 270b>.

<sup>378</sup> *Ibid.*, 243a

<sup>379</sup> Plato, *Thaetetus*, translated by Harold N. Fowler (Cambridge: Harvard University Press, 1925) accessed September 7, 2012,

<http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0172%3Atext%3DTheaet.%3Apage%3D199,198-9, especially 199d>

<sup>380</sup> Plato, *Cratylus*, translated by Harold N. Fowler (Cambridge: Harvard University Press, 1925) accessed September 7, 2012,

<http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0172%3Atext%3DCrat.%3Apage%3D436, 436d>

elements that produced all beings in the world to be like the letters of the alphabet.<sup>381</sup> Empedocles considered letters, and colours, elements of natural philosophy.<sup>382</sup> Neo-Platonism considered the poetic and sacred language of nature. Plato's *Timaeus* is a microcosmic literary work of the giant 'poem of the universe'. In Homer, Achilles' shield is a reduced model of the world that recreates the world: as a reduced model, it describes the fabricated world.<sup>383</sup> Given the classical education enjoyed by most Victorian scientists, it should be expected, therefore, that a scientist like Maxwell would write of the "language of nature"<sup>384</sup>—as did Pupin.

What science does, Pupin writes, is poetry, and how it works is prose. In writing or speaking of science, Pupin drew heavily on his undergraduate degree in the classics, which would also have taught him the foundation of rhetoric, which the reviews of his autobiography referred to in chapter one praised him for. An example of this was his comparison of Homer's epic of the wandering Ulysses to the invention of the caloric engine, through the translation of the intuition of the sun's energy, as illustrated by ancient sun worship, into the language of modern science.<sup>385</sup> Advertisements for his talks emphasise his rhetorical skill.

The connection Pupin saw between art (which includes literature) and science is made clear thanks to the fact that he elaborated these points in different contexts. Pupin, as many thinkers of his time and even well into the 20<sup>th</sup> century, would revisit certain anecdotes, comparisons, or ideas in different books, articles, and speeches. Thus, in summarising his views, excerpts will be made from the various sources from which he developed the ideas found in his autobiography. As for critique of self-plagiarism, an odd fixation of today,<sup>386</sup> the view taken in this paper is that if one has arrived at a clear idea, it is only natural for this idea to be revisited in different contexts for the purpose of further clarification, as a sort of intellectual-refrain, helpful for dissemination. That is not to say

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<sup>381</sup> Hadot, *Veil*, 207.

<sup>382</sup> *Ibid.*, 208.

<sup>383</sup> *Ibid.*

<sup>384</sup> Campbell, *Maxwell*, 131.

<sup>385</sup> Pupin, "Commencement Address at the University of Rochester" (speech delivered at University of Rochester, Rochester, New York, June 20, 1927), CU Rare Books, M.S. 1035.

<sup>386</sup> One which stresses that writing, above all, bears a commercial value – and a value which is reduced if all of the ideas in a piece of writing are not exclusive.

that Pupin was like Paul Feyerabend's account of Galileo, drawing heavily on the resources of rhetoric, propaganda, and epistemological trickery to support his scientific ideas,<sup>387</sup> for the ideas Pupin revisited and the talks he gave were not only about science and when they were they often came to theological or classically-inspired conclusions. In this respect, he was more of a Feyerabend scientist-philosopher.<sup>388</sup>

One of Pupin's refrains is that mankind has "three higher endeavours": the intellectual, aesthetic, and spiritual. Pupin argues that without the spiritual, the arts, education, and science would have no results.<sup>389</sup> This is perhaps one of the most important connections between art and science, because the ultimate goal of both is the same—the search for God. This is expressed clearly in his article on "Cosmic Rays", in which he describes a "mysterious veil which covers the face of space-time entity and which separates the world of ultimate reality from the world presented to our senses and interpreted by more pictures of mathematical symbols. Faith alone penetrates it and finds behind it the throne of the divinity which created that space time entity..."<sup>390</sup>

Another of his refrains is the 'language of science'. "Communication begins with Job: 'Speak to the earth and it shall teach thee'". Light and sound are then described as messengers; the ability to decipher these messages as a "gift from heaven" which now enables men far away to hear each other (on the phone).<sup>391</sup>

Pupin also uses poetry as a form of interpretation of Tyndall's principle of "creative coordination", which appeared chaotic to Pupin's eye, as it would to many classically-educated minds that did not subscribe to atomism.<sup>392</sup> He brings order to Tyndall's

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<sup>387</sup> Paul Feyerabend, *Against Method* (London: Verso, 2002), 14-17.

<sup>388</sup> Paul Feyerabend, *For and Against Method* (Chicago: University of Chicago Press, 1999), 385-6.

<sup>389</sup> Pupin, *Immigrant*, 320, which may have been inspired by the Cornell President, Andrew White's, comment that "The reverence for scientific achievement, the revelation of the high honors which are in store for those who seek for truth in science ... thereby shall come strength and hope for higher endeavour," *ibid.*, 203. Also see 378 and 274, and *The Oakland Times*, March 25, 1926, and Pupin, "Creative Coordination: A Message from Physical Science," *Scribner's* 82, no.2 (August 1927), 147-152, accessed August 6, 2012, <http://www.unz.org/Pub/Scribners-1927aug-00147>.

<sup>390</sup> Pupin, "Cosmic Rays: Two Brief Statements," no further bibliographical information, CU Rare Books, M.S. 1035.

<sup>391</sup> Pupin, "International Communication Dinner," May 4, 1932, CU Rare Books, M.S. 1035.

<sup>392</sup> For Pupin's direct rejection of a non-harmonious view of the universe, see Pupin, *Immigrant*, 384: "There are many pessimists to-day who prophesy the opposite course of development of this, in their opinion, most



principles through the task he sets for man, which he illustrates with an excerpt from a poem by Tennyson: “I hold thee here root and all, in my hand/ little flower... but if I could understand/ what you are, root and all, and all in all/ I should know what God and man is”.<sup>393</sup> Pupin explains, in his own understanding of ‘modern science’, that “to guide this complex life from a threatening chaos to a social cosmos became then the highest problem of a man’s creative soul.”<sup>394</sup> While Pupin quotes Tennyson in a context quite different to when Tennyson’s “The Higher Pantheism” was read at the first meeting of the Metaphysical Society,<sup>395</sup> that very setting, along with the venue, further emphasise there being a connection between poetry, science, and God—a metaphorical trinity Pope would approve of.

Pupin often uses mimetic techniques to reiterate key ideas. He writes that the piston imitates the Olympic gods, transforming chaos into cosmos.<sup>396</sup> He asks whether the “language” of science can describe the creative process which brings this internal world into existence without employing the vocabulary of speculative philosophy. His answer is revealed through his descriptions of science which draw on his knowledge of the classics. This may be illustrated by passages that he wrote about stars, such as the one in which he explained that the ancient Greek knowledge of harmony and beauty in the universe is proved by what modern science now teaches about stars: “The Greeks of old believed that the world started with chaos, and that out of the chaos came the cosmos. They were optimists, because in their theory coordination, order, and beauty were evolved out of hideous disorder ... Modern science confirms the ancient belief of the Greeks in a

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wicked world. Modern science confirms [there is coordination and order, and that beauty evolved out of disorder] in a remarkable manner.”

<sup>393</sup> Pupin, “Commencement Speech, Rochester.”

<sup>394</sup> Ibid.

<sup>395</sup> Meeting cited in Robert M. Young, “Natural Theology: Victorian periodicals, and the fragmentation of a common context,” in *Darwin’s Metaphor: Nature’s Place in Victorian Culture*, accessed 6 August, 2012, <http://www.human-nature.com/dm/>. The society was soon deemed too abstract and was thus a failed attempt to create a common context of ideas for science and metaphysics. But just because that society failed does not mean such an attempt should fail altogether.

<sup>396</sup> Pupin, “Creative Coordination,” in *Scribner’s* 82, no.2 (August 1927), 147-152, accessed August 6, 2012, <http://www.unz.org/Pub/Scribners-1927aug-00147>.

remarkable manner. Nothing else so resembles that chaotic start of the world which the ancients conceived as does the activity of a young star ...”<sup>397</sup>

In this way, the star becomes symbolically charged in terms of both science and the harmony of poetry. This understanding of the star is first suggested by his mother, in a quotation we have already seen, where electricity is described as an imitation of the divine message sent to the stars: “Just think of it, my son: God has been sending his messages from star to star and, according to David, from the stars to man, ever since the creation of Adam, employing the very same method and means which man, imitating the divine method, is beginning to use when he employs electricity to carry his message to a distant friend.”<sup>398</sup>

An earlier passage about stars also mentions David, as well as the Lermontov line of “star speaketh to star” cited at the beginning of the book.<sup>399</sup> It is interesting that Pupin’s mother’s words echo the poem. Stars are not only poetic and scientific, but religious symbols here.

The connection of Pupin’s mother to the stars also occurs elsewhere in the book, such as in an anecdote of hers he relates about a tin star at the top of the church that disappeared and was used to demonstrate reaching great heights in life.<sup>400</sup> The poetic star motif begins in his birthplace, Idvor, where, we learn in the first chapter, the locals observed the positions of the stars.<sup>401</sup>

The stellar motif is continued in Pupin’s discussion of the language to describe science, which does not consist of “cold” facts, and idealism in science, which is poetic, and half-anchored in the stars (not only the mind): “it is gross abuse of language to speak of cold facts of science. It is such language that creates prejudice against science ... Every physical fact has two terminals; one is in our consciousness, and the other is in some star which is rejoicing in the blazing vigor of its youth. Just as the life activity of the early blossoms, and of the honey-hearted fruit of the mellow summer season, has its origin in the

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<sup>397</sup> Pupin, *Immigrant*, 384.

<sup>398</sup> *Ibid.*, 245.

<sup>399</sup> *Ibid.*, 18.

<sup>400</sup> *Ibid.*, 178, 168-9.

<sup>401</sup> *Ibid.*, 16.

life-giving breath of the heavenly bridegroom, the glorious sun, so every terrestrial activity, every physical fact ... can trace its origin to the life-giving breath of some heavenly bridegroom, some burning star.”<sup>402</sup>

Ultimately, he explains how he interpreted the stars once and for all through science, which helped him to understand the Psalms: “Fifty years ago, instructed by David’s psalms, I found in the light of the stars a heavenly language which proclaims the glory of God, but I did not know how that language reached me, and I hoped that some day I might find out. That hope was in my soul when I landed at Castle Garden. Today science tells me that the stars themselves bring it to me. Each burning star is a focus of energy, of life-giving activity, which it pours out lavishly into every direction of the energy-hungry space; it pours out the life of its own heart, in order to beget new life. Oh, what a beautiful vista that opens to our imagination, and what new beauties are disclosed by science in the meaning of the words in Genesis: ‘He breathed into his nostrils the breath of life, and man became a living soul.’”<sup>403</sup>

In this way, the star motif is connected to the ideals Pupin’s autobiography seeks to promote at the end, where the stellar is what speaks to idealism, and guides it,<sup>404</sup> which, we may remember from an earlier section in this work, is essentially the classical model of mimesis, seeking to imitate the heavens. Explicit to Pupin’s model, however, is the importance of language.

At this juncture, a related digression would allow us to raise the question of what constitutes not just language but also “writing” in the first place. Davenport argues that, “Scientific language (which, like poetry, is cared for word by word) is as interesting to the artist as the language of fine prose and poetry to the scientist.”<sup>405</sup> He further demonstrates how a scholastic, poetic description of love in a poem is hardly distinguishable in precision and rich observation as the record of certain plants.<sup>406</sup>

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<sup>402</sup> Pupin, *Immigrant*, 380.

<sup>403</sup> *Ibid.*, 381-2.

<sup>404</sup> *Ibid.*, 315.

<sup>405</sup> Davenport, *Geography*, 239.

<sup>406</sup> *Ibid.*, 238.

It is only through pushing the boundaries so to speak that there is a chance to articulate what Arnold calls “the needful thing”. In this way, the social concerns of Dickens and Ruskin (who was also a botanist) can be seen in Pupin’s literary statements such as: “Has our civilization reached its lofty aim to raise the life of man to Olympian heights in conquest of space, yes, but not in terms of the spiritual side” in which terms, man’s works were far from edifying: given the wars and economic wealth in the face of starvation. Pupin’s answer: “Another moving power is sorely needed which can penetrate more deeply than the moving power of even the infinitely minute electrons into the depths of the human heart. This need was recognized nearly 2,000 years ago when our Saviour revealed the greatest moving power in the spiritual world and commanded us to love the Lord our God and to love our neighbours as ourselves.”<sup>407</sup> Such declarations became increasingly rare already in Pupin’s time.<sup>408</sup>

Much like Ruskin, Pupin is critical of the developing materialism: “An utter lack of understanding of the meaning of this material structure is responsible for the belief that it hides the source of modern materialism. This source is much deeper than the deepest foundation of any material structure raised by the genius of man in the deepest part of the soul where greed... invaded the nursery of beauty and goodness which revealed the world of Raphael, Milton and Beethoven [which is a] spiritual world *outside the boundaries* of the physical world in which the scientist and engineer are devoting their lives to the exalted mission of strengthening the material foundations of our civilization. The powers discovered and harnessed by them have no control over the spiritual world.”<sup>409</sup>

Pupin sought the essence of ideas—meaning that they could be expressed in the cloak of either science or literature: “I knew that even a classical scholar can be thrilled by science when it is presented to him in an attractive dress of the classical age... Some day a Homer in science will dedicated an epic to the wanderings of the exiled carbon atoms just

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<sup>407</sup> Pupin, “Presentation of the Fritz Medal,” January 27, 1927, CU Rare Books, M.S. 1035.

<sup>408</sup> Zolla, “The Fruits of Industry,” in *Eclipse*, 3-19, observes that prose seemed to be struggling to address the sight of the industrial city. He cites Israel Potter, “Whichever way the eye turned ... no speck of any green ... The black vistas of streets ... as flat as tombstones.” Also Dickens’ *Coke Town in Hard Times* and Dostoevsky’s article on London in 1863, “It requires strength of spirit and great abnegation not to succumb – to the fait accompli, that is, not to mistake what exists for the ideal, not to adore Baal.”

<sup>409</sup> Pupin, “A Message from Science,” *Scribner’s* 93, no.5 (May 1933), 300-302, accessed August 6, 2012, <http://www.unz.org/Pub/Scribners-1933may>. Emphasis added.

as Homer of old dedicated his immortal epic to the wanderings of Ulysses.”<sup>410</sup> Similarly, Pupin uses the principle of mimesis to explain science—wherein science is but a language we decipher to bring us to God (and, we might add, language is our co-creation and being with God).<sup>411</sup> In this way, he explains how the “machine civilization” is a crude copy of nature’s primordial machines.<sup>412</sup>

That Pupin saw God behind nature is crucial to our understanding of all that Pupin wrote, particularly when he wrote of the machine, which was never, to his mind, a thing to be worshiped but something to be thankful for. In this context we are wont to remember Arnold’s passage: “He who works for sweetness and light works to make reason and the will of God prevail. He who works for machinery, he who works for hatred, works only for confusion.”<sup>413</sup> It is the worship of machinery, the taking it for granted like an isolated, fixed talisman, that is opposed to man’s disinterested pursuit of perfection. It is therefore not the machinery but how it is viewed that is the problem. In this way, we may understand Pupin when he writes: “The American worship of the machine is likened to the poetic fancy of the ancients, who saw in our central star a radiant sun-god, bringing gifts to terrestrial life.”<sup>414</sup> And it is in this larger context of the “social cosmos” and the work man must do to transform chaos into a cosmos that he writes that “idealism is the quickest way to advance the creative power of American industries”.<sup>415</sup>

The interconnectivity between science and literature is thus the fresh perspective gained through the scientific approach, as well as the hopes that these new ideals and or resulting understandings could lead to a better world. His hermeneutical frame addresses many of Arnold’s social concerns, as well as Arnold’s argument that consciousness should flow freely round the petrified rule of life and renew it—not living mechanically, but with constant reference to some ideal of complete human perfection.<sup>416</sup> This latter approach,

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<sup>410</sup> Pupin, “A Message from Science,” 302.

<sup>411</sup> Pupin, “The New Reformation – The Triumph of Individualism in Science,” *Scribner’s* 79, no. 2 (February 1926) 113-120, accessed August 6, 2012, <http://www.unz.org/Pub/Scribners-1926feb>, and *Scribner’s* 79, no.3 (March 1926) 275-283, accessed August 6, 2012, <http://www.unz.org/Pub/Scribners-1926mar-00275>

<sup>412</sup> Pupin, “A Message from Science,” 300-2.

<sup>413</sup> Arnold, *Culture*, 50.

<sup>414</sup> Pupin, “Romance of the Machine,” 132.

<sup>415</sup> *Ibid.*, 130.

<sup>416</sup> Arnold, *Culture*, 118-20.

which Arnold calls “Hellenistic”, is intriguingly similar to the freeplay of *poiesis* that is characteristic of cultures with an oral tradition. This point is raised and contested specifically with regards to “Serbo-Croatian” poetry.<sup>417</sup> Given that this poetry enhanced the *poiesis* in Pupin’s autobiography (with its mentions of *vilas* and Prince Marko), it will be posited that “Serbo-Croatian” poetry is creative, and even inspires creativity in listeners (Pupin was such a listener, as a child). It is noted here that there are disputes even within the science of literary analysis as to which cultures are to be privileged with the epithet of “creative”.

Opinions differed as to whether science could be considered, as Pupin often did, idealistically; some were increasingly adamant that science be divorced from soulful fancy, forever, while others, still, saw science as a destructive force against all that is poetic and creative in experience.

### 3. 1. Scientific ideals and poetic narrative

It will be argued that the classical view of the arts and sciences, which as we saw in the previous chapter Pupin largely subscribed to, was to stress the moral aspect of the physical world as reflected in the ancient educational ideal of *paideia*, which combines the practical and the social aspects of education: the rhetorical, philosophical (spiritual), mathematical, etc., and a broader political awareness. What we now call scientific fact was important only insofar as it led to the good life. In this way, the ancient Greeks were devoted more to *theoria* (or contemplation) than to progress.<sup>418</sup> And while many Victorian scientists, including Pupin, introduced the notion of progress to these morals, the progress was ultimately symbolic in nature, not materialistic. Writing about progress, Pupin writes:

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<sup>417</sup> The oral-formulaic theory itself developed first in response to “Serbo-Croatian” poetry in Albert B. Lord’s *The Singer of Tales* (Cambridge: Harvard University Press, 2000), accessed May 20, 2012, <http://www.ling.upenn.edu/~rnoyer/courses/103/SingerOfTales.pdf>, first published in 1960, and was most heavily contested by Geoffrey Kirk in *The Songs of Homer* (1962).

<sup>418</sup> John Herman Randall, “Plato’s Treatment of the Theme of the Good Life and His Criticism of the Spartan Ideal,” *Journal of the History of Ideas* 28, no. 3 (Jul- Sep 1967): 307-324, accessed August 6, 2012, <http://www.jstor.org/stable/2708621>

“Does not all our experience teach us that progress means more complete coordination of all natural activities, the activities of the atoms in the burning stars as well as of the cells in our terrestrial bodies? Call this progress evolution, or anything else you please, it certainly is there, and it leads to a more beautiful and a more perfect order of things.”<sup>419</sup>

As stated earlier, the metaphorical scheme of such arguments that bridge more than one field together makes even scientific texts poetic. This may be illustrated through the popular topic of progress and how it was addressed. To Pupin, scientific progress was like a beam of light that shone through great scientists like Tyndall and Faraday, but which ultimately came from a sacred background, the source of eternal truth. He repeats this idea three times in his autobiography, which reveals it to be a fundamental idea.<sup>420</sup> His idea of progress was “a more beautiful and perfect order of things”<sup>421</sup>—“if attainable at all”.<sup>422</sup> This understanding is comparable with his mother’s definition of knowledge.<sup>423</sup>

His mother also once explained to him that she went to church to look at the icons of saints in order to contemplate their works and communicate with God. She compared church to Cambridge, “a great temple consecrated to the eternal truth: it is filled with icons of the great saints of science. The contemplation of their saintly work will enable you to communicate with the spirit of eternal truth.”<sup>424</sup> Pupin internalized her message and later developed his own definition of “idealism in science” to mean “the worship of the eternal truth and the burning desire to seek an ever-broadening revelation of it”.<sup>425</sup> In this way, when he considered the lauded inventions of his day, he deemed them great not so much for their “immediate practical value”, but because of the clarity of vision that enabled scientists to search for and reveal: “new morsels of the eternal truth. It was clear to me even at that time that inventions are the handwork of mortal man and that, though at first they appeal to

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<sup>419</sup> Pupin, *Immigrant*, 385.

<sup>420</sup> *Ibid.*, 191, 220-1, 321.

<sup>421</sup> *Ibid.*, 385.

<sup>422</sup> *Ibid.*, 387.

<sup>423</sup> She had told Pupin that, “Knowledge is the golden ladder over which we climb to heaven, knowledge is the light which illuminates our path through this life and leads to a future life of everlasting glory,” *ibid.*, 10.

<sup>424</sup> *Ibid.*, 191.

<sup>425</sup> *Ibid.*, 321.

us, as they ought to, as wonderful creations of human ingenuity, their ultimate fate is to become more or less commonplace.”<sup>426</sup>

Finally, because Maxwell wrote in *Nature* that, “We are probably ignorant even of the name of the science which will develop out of the materials we are now collecting, when the next great philosopher ... makes his appearance”, Pupin considered him a prophet,<sup>427</sup> continuing his mother’s divine metaphor in this way.

Maxwell’s view of “progress”, also cited in Pupin’s autobiography, was as broad and symbolic as Pupin’s: “Let us hope that from [Helmholtz’s] present position he will again take a comprehensive view of the waves and ripples of our intellectual progress, and give us from time to time his idea of *the meaning of it all*.”<sup>428</sup> Columbia President Barnard, also cited by Pupin, defines progress as the stimulation of minds to gather knowledge of nature’s truths.<sup>429</sup>

Pupin’s reference to the Cooper Union painting “Men of Progress” could be considered a sign of his definition of progress. Essentially, those men and their achievements showed “what things can do, rather than what they are”.<sup>430</sup> But it was Pupin’s life long search—according to his own narrative—to find out what science *is*, as demonstrated by the question he made his life’s mission: “What is light?”<sup>431</sup> His was a more idealistic, less utilitarian view of progress, as if he were responding to Pound’s exhortation in his *Cantos* against usury.

Pupin’s interest in nature’s truths could be interpreted as a Whewellian approach to science: wherein experience or observation has no meaning without guiding innate ideas which organize and make such observation accessible and ‘sensible’. This is in contrast to scientific theory derived from strict observation, and law only being found through the discovery of repetitive and natural phenomena. The Whewellian approach is taken by Eliot,

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<sup>426</sup> Pupin, *Immigrant*, 220.

<sup>427</sup> *Ibid.*, 221.

<sup>428</sup> *Ibid.*, 236. Emphasis added.

<sup>429</sup> *Ibid.*, 202.

<sup>430</sup> *Ibid.*, 78.

<sup>431</sup> Pupin answers his own rhetorical question: Light is the means to communicate with the Creator, *ibid.*, 18; the vibrating body of the stars, sun and moon, proclaiming the glory of God, *ibid.*, 20, 242, 171, 166, 133, 144, 255; associated with the divine method of speech, *ibid.*, 17-18.



in *Middlemarch*. But what ought to be stressed about this approach is that it, like empiricism, also valued that which is observed and measurable. Essentially, the heart of the matter here is the ordering technique: whether or not the scientist believes in some form of natural or universal order of ideas. Such order is found in Pupin's linguistic representation: as he explains at the incipit of his autobiography, "Sound and light became thus associated in my early modes of thought with the divine method of speech and communication, and this belief was strengthened by my mother, who quoted the words of St. John: 'In the beginning was the word, and the word was with God, and the word was God.'" Pupin reinforces this idea by citing a Psalm by David, and a Russian song by Lysy Montoff: "Night is silent and the plains are whispering/ To God, and star speaketh to star."<sup>432</sup> "I still believe these modes of communication are the fundamental operations in the physical universe and I am still meditating about their nature," he writes.

Even at the lower level of linguistic structure, there is ordering in language: grammatical, syntactical, phonological, and lexical. This ordering becomes more complex – and, as explained in the introduction, potentially more dangerous as the abstract, symbolic meaning increases and hierarchies are formed. If this is considered in terms of Bakhtin's statement that language is a battleground,<sup>433</sup> life can be viewed in terms of competing symbolic hierarchies. This would be straight forward except for the fact that competing hierarchies can intersect on varying levels and become the same in some instances. It also becomes complicated where form and essence diverge. If such paradoxes are accepted, the question of whether science has anything to do with poetry, and if so, what and how, takes on new dimensions. Pupin explains in several different ways how poetry and science are the same, or similar: sound and light as the language of God; what science *is* as poetry; God's language as distilled like poetry to be deciphered by the scientist through poetic vision. In every case, the language points to something beyond itself – to "higher levels of generalized thought" of "iconic augmentation" leading to what's "essential". Not all

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<sup>432</sup> Pupin, *Immigrant*, 18.

<sup>433</sup> See Bakhtin, *Dialogic*, 272, "it is possible to give a concrete and detailed analysis of any utterance, once having exposed it as a contradiction-ridden, tension-filled unity of two embattled tendencies in the life of language," and 273, "linguistics, stylistics and the philosophy of language" could make no provision for the dialogic nature of language, which was a struggle among socio-linguistic points of view," also 293-4, where the paragraph ends, "Language is not a neutral medium that passes freely and easily into the private property of the speaker's intentions; it is populated – overpopulated – with the intentions of others."

scientists at the time included God in their schematic hierarchy; those who did not were not necessarily diametrically opposed to those who didn't (e.g. Pupin and Tyndall).

An example of the crossroads of varying hierarchical systems can be seen in the use of the word "progress". As explained above, Pupin's definition was not necessarily that of Darwin. And yet the use of the word in his writings lends a contemporary feel to those texts. Within Pupin's framework, progress is part of the larger linguistic system distilled by God—and thus takes on the iconic augmentation of a metaphor. Still, his consideration of progress brings that aspect of his work in line with Tyndall's even though their metaphysical views differed. The abstraction of a word such as progress necessarily implies that not everyone will share the same idea of the word's essence. Discernment is key and may open the door to the vista of poetry in science. To this end, Davenport has pointed out that, "The place scientific writing might claim among the corpus of imaginative writing zoned off as literature by unstable rules for admission and rejection is a strong one, allowing for the inevitable airs of condescension from the protectors of letters. The spirit of our age has been curiously denying, although its search for purity is understandable."<sup>434</sup> It is also pertinent to note that the poetry of much earlier scientific writing is not recognized by many scientists of our age, either. It is possible to ask though harder to prove whether the rise of technology has lead to a dearth of the poetic.

Heidegger wrote in *The Question Concerning Technology* that man's "higher essence" is in danger as man is regulated, even subordinated by processes brought about by technology. In other words, technology calls man into presence, when really, it is man who should control the mode of unconcealment, the mode of revealing truth: man who should control *poesis*.<sup>435</sup> And while technology is not the same as science, it is a product of it: and if its effect is to re-order the essence of man and being into subservience, it is necessary to bring it in to a discussion of science, particularly where poetry—described by Claudel, as "being born together"—is also being discussed. As stated earlier, Gadamer argues for there to be participation with that which is observed. The gist of these ideas is encapsulated in

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<sup>434</sup> Davenport, *Geography*, 234-5.

<sup>435</sup> Heidegger, "Technology."

Pupin's autobiography where he writes about how progress must involve all of man<sup>436</sup> and as for an illustration of "being born together", he arguably provides one that could shine brighter than any poet's: "A star radiating light radiates electrical energy, and, therefore, it throws out to us a part of its own mass. When this radiation reaches us we can say, therefore, without indulging in figures of speech that the star is visiting us. I am not indulging in a flowery figure of speech when I call solar radiation the balmy breath of the heavenly bridegroom, the glorious sun."<sup>437</sup> In that quotation, we see that the figurative language emerges from a pure reflection of that which is.

It can be argued that poetry disappeared from scientific discourse in the early 20<sup>th</sup> century, and that this was in part due to the shift in discourse away from "pure" science to "applied" science, which is sometimes referred to as "technology". Henry A. Rowland's "Plea for Pure Science" which is quoted in Pupin's autobiography<sup>438</sup>, which was a rhetoric Pupin shared,<sup>439</sup> emerged in response to this shift, embodied in Edison and his approach to science. For much of Edison's life, even when he was supported by the scientific community who were fascinated by his achievements with the light bulb, he was not widely recognized as being a scientist: first, for his failure to observe scientific methodology, and second, for employing scientists who did most of the work for him. This arguably "technology-centric" approach led to Rowland's objection and "Plea".<sup>440</sup> While this topic will be dealt with later, suffice it to say for now that combined with the changing rhetoric on science, less ideal and poetic, was a changing socio-polity in science. And while it is very difficult to make distinctions between what is meant by "pure" and "applied"

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<sup>436</sup> Pupin, *Immigrant*, progress is holistic and beautiful, 385; scientific advance is for the spiritual not just physical welfare of man, 196; the scientific activities of great men was spiritual far more than material: 366 and 102; advancement through science is to be used for the spiritual wellbeing of a nation, 377-8.

<sup>437</sup> *Ibid.*, 381.

<sup>438</sup> *Ibid.*, 352-4.

<sup>439</sup> That he shared the rhetoric is clear from his admiration and citing of Rowland's words as an ideal scientific model in his autobiography. But the depth of how these ideals rang true to Pupin can be seen in how he passed those values on to his students. To this end, see examples cited in Ronald Kline, "Constructing 'Technology' as 'Applied Science': Public Rhetoric of Scientists and Engineers in the United States 1880-1945," *Isis* 86, no. 2 (June 1995): 194-221, accessed August 6, 2012, <http://www.jstor.org/stable/236322>.

<sup>440</sup> David A. Hounshell, "Edison and the Pure Science Ideal in 19<sup>th</sup> Century America," *Science, New Series* 207, no. 4431 (February 8 1980): 612-617, accessed August 6, 2012, <http://www.jstor.org/stable/1683476>. According to Kline, "Constructing," 199, fn. 15, this "suggests that Rowland may have been prompted to make these remarks because of sour business dealings with Edison."

science—let alone the distinction/relationship between science and technology (valid at the level of semantics<sup>441</sup> but less-so on the level of experience, which is a hermeneutic concern), it is a fact that there was more poetry in scientific discourse a century ago than there is today and that the *zeitgeist* of our age leans heavier on production and the device than ever before, as predicted by Heidegger. An illustration can be seen in the example of the automaton: used in ancient times to demonstrate metaphysical principles, but developed in modern times as an autonomous subject. This shift is less recorded in our language, as was the case of the word *hypokeimenon*, from *hyle* (forest, or readily available matter),<sup>442</sup> which implied less the material aspect of things than the *techne* involved in the grasp of becoming in nature. Indeed, words change meaning and essence with new historical experience. Perception changes: without delineating what it is, one cannot recognize it – as “we are constantly inclined toward seeing things that we know and recognize”.<sup>443</sup>

Today it is very hard to reintroduce poetry to scientific discussion. It is easier to remember stories about the world told in the past in order not to return to the past but to open up new pathways for further scientific discussion. To this end, this first section will question which linguistic processes and experiences are lost in “the search for purity” by looking to the past. The answer will inevitably be symbolic: we are *born* into language, *see* through language, *remember* through language, *pass on traditions* (both true and false) through language, and *forget* language—and with forgetfulness comes *death*. Such are some of the symbolic categories according to which we build meaning through language. We remember that Pupin was adamant that science not be spoken of in a “cold” language, because science is concerned with living things: “The physical facts of science are not cold, unless your soul and your heart are cold. There is white heat somewhere in every physical

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<sup>441</sup> Otto Mayr, “The Science-Technology Relationship as a Historiographic Problem,” *Technology and Culture* 17 (October 1976): 668, accessed August 6, 2012, <http://www.jstor.org/stable/3103673>. He writes, “One level on which one might hope to discover a definitive distinction between science and technology is that of aim, purpose, motivation. The aim of science, one might argue, is to explain the riddles of nature; the aim of technology, to solve the material problems of human life. The question about characteristic purpose will indeed furnish a criterion that separates the two concepts in a manner that is sharp, simple, and mutually exclusive. Unfortunately, however, it is valid only on the level of semantics. If we analyze actual historical events, we find that the motives behind actions are usually mixed and complex. Often scientific as well as technological purposes are pursued, simultaneously or at different times, by the same person, the same institution, and by the same methods and techniques.”

<sup>442</sup> Gadamer, *Beginning*, 79.

<sup>443</sup> *Ibid.*, 107.

fact when we decipher correctly the message which it conveys to us. A physical fact denotes activity, otherwise it could not penetrate the depths of our consciousness. Activity is life, in the broadest sense of this word. Death is cold, but life is hot, and it is gross abuse of language to speak of cold facts of science. ...”<sup>444</sup> Language is central to Pupin’s understanding of what science is.

The precursor of the epic tradition and the philosophy which precluded science is language. Gadamer locates in early philosophy a movement towards a conceptual language: that “wants to convey an image of what we call the universe”.<sup>445</sup> He points out the significance that we can even say ‘universe’: which unifies the totality of things. While man has embarked on a quest to reach the unity of the world, this has yet to be realised. And while modern science has arguably reached many new understandings about the world through increased specialization, there is no movement at the present time to unify this corpus of knowledge—which would invariably have to be done through the abstract system of knowledge and its metaphorical potential of the kind we see in Pupin’s work.

Some of the early texts about the nature of the universe allowed space for the mythical: the role of the myth in scientific discussion is to answer questions about the constitution of a world that is based on the principle of the good that cannot be proved through satisfactory logical argument.<sup>446</sup> There are notions or concepts for which there is no ready empirical data. In this sense, myth is not merely a story, but relates concepts and reflections. Myth is an extension of dialectic argument inaccessible to concepts and logical tradition.<sup>447</sup> In modern times, such notions or concepts are abandoned until they can be proved—as if by ignoring such a question, one can be right. The *weltgeschichte* changes and sometimes it seems that epistemology should be valued above empiricism so that we might better understand our predisposition for blind spots. An interesting example of this is present criticism of opponents to the heliocentric view (we also forget what our eyes show us: that *the sun rises* from the East). It has been pointed out that given the information and technology and even experience at hand, it should be taken for granted that heliocentrism

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<sup>444</sup> Pupin, *Immigrant*, 379-80.

<sup>445</sup> Gadamer, *Beginning*, 122.

<sup>446</sup> *Ibid.*, 42-3.

<sup>447</sup> *Ibid.*

was considered false. Thus, the truth, according to this equation, is dependent on the empiricism which, historically speaking, is temporally dependent. In many ways, this illustration also proves Heidegger's *Question Concerning Technology*, in that the truth is now dependent, in some ways, on the technology that provides empirical data. So, a reliance on myth need not be automatically discarded as the so-called detritus of the primitive mind. Especially if we are to consider myth as a symbolic, didactic tool, and remember that both the ancients and the humanists viewed history, whatever we say about ourselves in the past, as belonging to the art of rhetoric. We can easier make arguments about the past, than possess any truths. What is more, much is forgotten of human experience when the narrative forms are reduced.

Heidegger's views are also somewhat responsible for the "forgetfulness of being" he blames on technology, by shifting the common horizon of Western culture to a new metaphysics.<sup>448</sup> Finding one's way around in this new atmosphere that followed Pupin's era does not come easily, and is risky, in the way that Lakoff and Johnson warn that much depends on the symbolic systems we adopt (or forget). Yet much guidance remains in texts like Plato's *Phaedo*, which is about causation and scientific explanation—and the symbolic scheme one should adapt to live the good life.

According to the *Phaedo*, knowledge must be a remembering phase. The idea comes from an earlier tradition according to which he who can comment on "nature" or "history" must be one who has observed related phenomena first-hand. This is represented by the phrase, *peri physeos historia*, "a report of the experiences undergone to witness events".<sup>449</sup> In many ways, such a method is also characteristic of empiricism: a scientist can only report on that which he has seen, as the result of his experiments (experience?). This is addressed by Maxwell, and also by Ruskin.<sup>450</sup> But more central to the *Phaedo* is that which

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<sup>448</sup> Gadamer, *Beginning*, 126.

<sup>449</sup> Ibid., 45.

<sup>450</sup> Maxwell refers directly to this idea in his "Telephone Speech" as will be seen in more detail later, in Campbell, *Maxwell*. Ruskin, *Queen of the Air*, 110, 67, 102, respectively, addresses it implicitly: in the sense that experience can only be truly had by he who is prepared for it: "the universe is didactic only if we are worthy to be taught," "all guidance to the right sense of the human and variable myths will probably depend on our first getting at the sense of the natural and invisible ones," and hints at what this looks like, such as in this excerpt, "If it has too much ornament ... its carver was too greedy ... too little ... he was rude, or insensitive, or stupid. So that once you have learned to spell the most precious of all legends – pictures and

is beyond the empirical. The difference between the ancient and modern view has also to do with the concept of anamnesis, which according to Plato can be recorded by the soul, and has to do with truths about nature being masked in allegory and in stories. The *Phaedo* is relevant to questions of narration and science because it is a dramatic dialogue inspired by “investigations about nature”.

The *Phaedo* is primarily about the soul’s immortality but it also addresses mathematics, empiricism and non-empiricism, mind and matter (also a 19<sup>th</sup> century intellectual and scientific concern, which will be addressed later), and permanence and change. In terms of it being a literary work, Gadamer points out that its theoretical arguments are fused with dramatic action, and many of the ideas are represented through the *life* of Socrates.<sup>451</sup> The end of the dialogue is also a myth, which again, through the “particular forcefulness” of myth, allows for an idea to be forwarded for which there is no satisfactory argument.<sup>452</sup> That these ideas are wrapped within this literary form reflects what Plato would address later about poetry in *The Republic*. There, he, too, uses stories to illustrate the dangers of poetry: the untrained mind is prone to take art literally. Despite its dangers, the story form is the most efficient vessel by which to convey a message.

The *Phaedo* is like a philosophical, scientific autobiography, also revealing the secret of death and what lies beyond. It is of primary interest here because in it, Socrates admits that he was once very passionate about the kind of knowledge called “investigations on nature”. He explains how he came to realize that his being “imprisoned” in his body was not so much due to a strict material explanation, but because of moral necessities that in turn dictate the mechanical. Socrates proceeds to demonstrate that not all knowledge can be gained through experience. He illustrates this through making a comparison with mathematics: there are never two completely identical entities in life, but there are in maths.

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buildings – you may read the characters of men, and of nature.” Lest we take his reading of buildings too literally, “spirit is continually creating its own shell of definite shape out of the wreck around I; and this is what I meant by saying ... ‘you may always stand by form against force,’” *ibid.*, 58.

<sup>451</sup> Gadamer, *Beginning*, 48.

<sup>452</sup> *Ibid.*

He then compares the soul to mathematics: neither is sensory, neither can be known through experience.<sup>453</sup>

But it is not enough to relate just those features of this very much literary text about nature. The text begins with a Homeric myth: Odysseus goes to Hades, and loses his memory as he crosses the Acheron. Without memories we die (he regains his memory to return to the living when he drinks sacrificial blood). Knowledge is also a form of memory. What we gain here, and what is lost to the master narrative of science and remains only in some philosophy, is the notion that as much as knowledge is revealed, it can also be concealed. This is the warning. Also, in the quest for knowledge, one must look for the cause in the question of becoming and passing away. It is here where he departs from mathematics (“science”) to metaphysics—as prompted by pain, the *pathe* of his passion for knowledge.<sup>454</sup> In many ways, Pupin’s narrative begins similarly, with his memory of the memory of his Idvor ancestors: where page one addresses the uncertainties of transit, page two embarks on themes “immemorial”.

Thence the significance of the goddess Mnemosyne, the muse who retains and contains. “In our relationship with the world and in all our creative labours ... our accomplishment lies in retaining what threatens to pass away.”<sup>455</sup> And lest it seem that the importance of memory does not belong to philology, “It is the proper function of the symbol and of the symbolic content of the language of art in general to accomplish” the recognition that “elicits the permanent from the transient.”<sup>456</sup> In the “Proem” of Parmenides’ *On Nature*, before he sets out to narrate the understanding of experience undergone by one who knows much, he needs an introduction by Mnemosyne.<sup>457</sup> The warning that what is known can pass away is ever present, as it came to us in modern times through Heidegger,<sup>458</sup> and an ongoing fascination with Heraclitus’ *phusis kruptesthai philei*—most commonly translated as nature loves to hide, but for which Hadot suggests five different meanings, including: the constitution of each thing tends to hide, the origin

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<sup>453</sup> Gadamer, *Beginning*, 45.

<sup>454</sup> *Ibid.*, 50-1.

<sup>455</sup> *Ibid.*, 46.

<sup>456</sup> *Ibid.*, 47. What is more, memory is a main component of rhetoric.

<sup>457</sup> *Ibid.*, 98-9.

<sup>458</sup> Gadamer, *Relevance*, 34.



tends to hide itself, and form or appearance tends to disappear.<sup>459</sup> He traces knowledge of this statement through Shakespeare's "Thou nursest all and murder'st all that are", as well as to Marcus Aurelius, Montaigne, and Leonardo.<sup>460</sup> To forget that what is known can be forgotten is not part of the current master narrative about science, which stresses the reach of scientific progress as if it were an indestructible tower of Babylon. Gadamer presents a strong argument for the ontology of forgetting and creativity: "The computer is something impoverished because it cannot forget and therefore is not creative. Creativity depends on the choices made by our reason and our capacity to think."<sup>461</sup> Thus the literary flair and appearance of Mnemosyne in the *Phaedo*.

Davenport's consideration of what we can forget from the past reminds us of how little we know of our beginnings, our origins. "We still have no information as to how races branched out from each other, where we first lived, where civilization arose. Our past is forgotten and we can forget it again."<sup>462</sup> This riddle is indicative of Platonic anamnesis and the riddle of language. They have no *principium*, no beginning, and their terms cannot be derived from a *principium* as if there were an "ortho-language." The speaking of a language is a "totality, a structure within which we have our place – a place which we have not chosen. Likewise, memory, which represents one way of articulating our experiences, is a process which may already be underway in utero."<sup>463</sup>

Other writers have addressed the principium and how it informs language. Kristeva ties the "maternal rejection" of man's very birth to a new signification: according to her, as well, language drives are pre-verbal.<sup>464</sup> Later, words ease the psychic experience by filling the emptiness<sup>465</sup> There is a tension between the semiotic (the element of signification associated with drives and affects) and the symbolic (the element of signification associated with position and judgment). The tension makes language signify or become significant.

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<sup>459</sup> Hadot, *Veil*, 9-10.

<sup>460</sup> Ibid., 9-13.

<sup>461</sup> Gadamer, *Beginning*, 69.

<sup>462</sup> Davenport, *Force*, 8.

<sup>463</sup> Gadamer, *Beginning*, 30.

<sup>464</sup> Kristeva, *Portable*, 134.

<sup>465</sup> Ibid., 122.

Meaning is constituted in the space between body and culture. The meaning of words, in the narrow sense of the symbolic element of language, is charged with effective meaning, in the broader sense of the semiotic element of language, through the movement of drive energy within psychic space.<sup>466</sup> Psychic space is between the biological, preverbal state as per Lacanian, bodily, acquisition of language, and the social, through which drives move energy between these two interconnected spheres. The “talking cure” involves giving meaning to language by reconnecting words (symbolic) and affects (semiotic) and thereby giving meaning to life.<sup>467</sup> The drives are made peaceful through articulation. By making connections, at the most basic level of the human being, meaning emerges, particularly visible in poetry.<sup>468</sup> Pupin’s autobiography, which as we have seen considers poetry to be at the heart of science, makes connections: between cultures, between the arts and sciences, between humble beginnings and elevated social status, and so forth, ultimately ending with the theme of not only scientific but also democratic ideals, which is the lived poetic vision of man resonating with the order of the divine stars.

Burke writes of the relationship between the “principles” of poetry discovered by the reader: regardless of whether the poet is aware of these principles, they occur *in principio*.<sup>469</sup> Pupin writes that in the beginning is the Word. Gadamer’s definition of the “beginning” is not that which is incipient, but incipience, being incipient, i.e. not yet determined – with many eventualities. As such, the linguistic experience is actually one that is open to creativity, providing we *remember* that we are not subsumed to the machine.

Thus to return of the myth of Mnemosyne and especially of Odysseus’ journey to Hades, the function of myth is that of a narrative of origins. “Myth is not a logical operation between any propositions whatsoever, but involves propositions which point towards limit situations towards the origin and the end”.<sup>470</sup> By focusing on the essential, such writing is often the source of what is essential to knowledge about action as well. For, as Kristeva shows, there is already a preverbal action that drives words into being. Action is essential to language. Ricoeur describes narrative fiction as interposing its schematization of human

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<sup>466</sup> Kristeva, *Portable*, xxiv.

<sup>467</sup> *Ibid.*, xxiv.

<sup>468</sup> *Ibid.*, 27-136.

<sup>469</sup> Burke, *Language*, 34.

<sup>470</sup> Ricoeur, “What is a Text?,” in *Reader*, 59-60.

action onto a map of action.<sup>471</sup> Fiction is an irreducible dimension of the understanding of self. The story guarantees man, who emerges from a background where he was entangled in the stories that happen to him.<sup>472</sup> “Life is the attempt to recover the narrative identity which constitutes us”<sup>473</sup> Through *logos*, we are saved from the river of forgetfulness or concealment and gain eternal life.

And if *logos* also means “relation” or “connection” as Kristeva suggests, this *logos* acts like the metaphor does. This may be illustrated through Gadamer’s description of the origin of the meaning of the word symbol: once a term in Greek for a token of remembrance. The host presented his guest with an object that was broken in two: half for himself and half for the guest. If sometime later the guest’s descendants were to enter the house, the two halves of the object (the *terra hospitalis*) would be fitted together again to form a whole in an act of recognition. The symbol was therefore something in and through which we recognize someone already known to us.<sup>474</sup>

Connotative values are a system of associated commonplaces, which enlarge the meaning of our words, adding cultural and emotional dimensions to the literal values codified by our dictionaries. Of course, there are no metaphors in a lexicon, but beyond the lexicon there is what Aristotle called the *topoi*, the cultural treasure of meanings. The art of the metaphor is to apply a part of this treasure to new subjects, to use it as a screen which not only selects, but which brings forth new aspects in the principal subject.<sup>475</sup>

Thus to return to what a text like the *Phaedo* represents, it is ultimately a symbolic remembrance of lessons with the possibility to increase the chances of a better life, similar to the didactic quality of Pupin’s autobiography, which he ends by hoping that he has contributed to the overall betterment of humanity as either immigrant (i.e., culturally) or scientist, which were two of the threads of his narrative, a narrative which began with the

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<sup>471</sup> Ricoeur, *From Text*, 176-7.

<sup>472</sup> Ricoeur, “Life: A Story In Search of a Narrator,” in *Reader*, 435.

<sup>473</sup> *Ibid.*, 436.

<sup>474</sup> Gadamer, *Relevance*, 31-2.

<sup>475</sup> Ricoeur, “Word, Polysemy, Metaphor,” in *Reader*, 79.

concern of “immemorial” stories of ancestral import.<sup>476</sup> The *Phaedo* presents lessons for the improvement of man partially by addressing limit situations. It also teaches something about experience, with the preface that such knowledge can be lost. This framework of consideration has been lost in the ‘scientific’ approach to nature: it is observed that such tensions are not the exclusive product of modern times; rather, it seems to be produced by the disregard for poetry and a holistic if limited view. In fact, it is argued in the *Phaedo* that there was an awareness that such understanding emerges from and shares the limits of language, without ‘transcending’ language. To return to Heidegger’s *Technology*, we can see that while the attempt was made to subordinate nature with particular Promethean relish (to borrow Hadot’s phrase), man has been losing his *poiesis* as a result: “‘The contemporary period is one in which man perceives everything in the form of a device and an exploitable supply, including himself, and simultaneously his own being.’ For Heidegger, mankind must return to Greek *poiesis*, which is also a form of unveiling, or making-something-come-to-light. Thus, for contemporary man, art could be a means for rediscovering his authentic relation to being and to himself.”<sup>477</sup>

In what can be seen for our purposes in this chapter as a conclusive statement, wrapping up the relevance of including discussion of the *Phaedo*, Hadot writes: “Technology is engendering a way of life and ways of thinking that have as their consequence the ever-increasing mechanization of human beings themselves. It is impossible, however, to stop the implacable progress of this kind of civilization. In the process, mankind risks losing its soul as well as its body.”<sup>478</sup>

Similarly, Burke writes that scientism needs to be counter-balanced by “intuition, “imagination”, “vision”, “revelation”, and “chimera”.<sup>479</sup> The words “spontaneity”, “creativity” and “virtues” are used by Zolla, who explains that man’s loss of agency in the

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<sup>476</sup> Pupin, *Immigrant*, 387: Pupin hopes to have “contributed anything substantial to the progress of this splendid movement [i.e., the evolutionary progress made possible by coordinating instrumentalities], whether as an immigrant or as an inventor”.

<sup>477</sup> Hadot, *Veil*, 170.

<sup>478</sup> *Ibid.*, 151.

<sup>479</sup> Qtd. in William H. Rueckert, *Kenneth Burke and the Drama of Human Relations* (Berkeley, Los Angeles, London: University of California Press, 1983), 38.

modern world has stripped him of those values, making him more a mechanical gambler than a farmer or warrior.<sup>480</sup>

It is thus suggested that art is a way to balance the disorder of being that comes about through perceiving the world through mechanical metaphors, and that imbalanced action, such as that of exploitation and production, creates imbalanced symbolic structures, which in turn affect man's experience of the world. This is what Pupin means in his message about creative coordination, which shall be explored in more detail later, that for progress, all of man must be engaged: the intellectual, aesthetic, and spiritual. It is also what Arnold means when he writes of the "machinery" that keeps us from our best selves by thriving on our base characteristics: "There is a kind of philosophical theory is widely spread among us to the effect that there is no such thing at all as a best self and a right self and a right reason having claim to paramount authority ... and that there is nothing but an infinite number of ideas and works of our ordinary selves ... pretty nearly equal in value."<sup>481</sup> In contrast to this, Arnold writes of "the substance of things hoped for, the evidence of things not seen".<sup>482</sup>

'Art' has the possibility to change the present experience because 'art' includes representations of ideals. It includes, too, invisible—imagined—orientational metaphors, and emphasizes being, as in Claudel's "being born together", returning man to his original drives and limits, but including him as an active participant in the process. Burke argues for a "dramatistic" approach to man, for merely defining man as a symbol-using animal is too scientific.<sup>483</sup> Drama implies action, action implies experience. As expounded in Plato's *Gorgias*, many arts have their origin in experience because experience makes the days of men proceed according to art and inexperience—according to chance. Thus to take control of life, one is to create, not haphazardly, but with an eye for the well-crafted metaphor: the bridges between good ideas and life, the mimetic dance of the heavens between the ideal, the human mediated reflection, and the dramatic aspect, where man attempts to live according to these ideals.

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<sup>480</sup> Zolla, *Eclipse*, 66-82.

<sup>481</sup> Arnold, *Culture*, 81.

<sup>482</sup> Ibid., xxxvi.

<sup>483</sup> Burke, *Language*, 10.

This classical notion, observed by scientists such as Maxwell, whose work Pupin both read and praised,<sup>484</sup> and central to Pupin's autobiography as we have seen through the motif of the mimetic poetry of the stars,<sup>485</sup> is illustrated in the *Timaeus-Critias*, and Aristotle's reading of it. According to Plato's mythical tale, the universe is founded on mathematical regularities, but this is why the universe differs from the world regulated by politics, society and laws. Only heaven is perfect as it was designed by a craftsman god; the details implemented by subordinate deities are responsible for the accidental, the irregular in human life. The *Timaeus* is, "presented as a *poesis*, that is, as both discourse and a poem, or an artistic game that imitates the artistic game of the poet of the universe, the divinity"<sup>486</sup>; "the work of art, the discourse or poem, as a means of knowing Nature."<sup>487</sup> Aristotle transforms this myth of the craftsman-god into his concept of *physis*, wherein motion, form, function, time illustrate the concept of *techne*: those concepts that describe the action of the craftsman. The model for humankind lay in the illustrations of the skillful craftsman. All human knowledge is compared to *techne*.

Further artistic dimensions of 'science' in Aristotelian thought can be demonstrated by the understanding of the material, which is not matter for it is the product of *techne*. Matter does not acquire design on its own: matter is the *sine qua non* of the craftsman. The key is the movement: the transformative role of nature. For Plato, *physis* (nature) is a divine art; *physis* requires artistic and technical activity, and cannot occur without the intervention of thought: nature's action is like the creation of a work of art.<sup>488</sup> Like a true classicist, Pupin considers his science in no way inferior to the other fine arts because he considers of paramount importance the cultivation of the beautiful, which has immediate spiritual overtones for him.<sup>489</sup> We may also wish to remember that he wrote in his autobiography that poetry is what science *is* (prose is what it does).<sup>490</sup>

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<sup>484</sup> See Pupin, *Immigrant*: 133, 135, 144-5, 153, 166, 171, 175-6, 179-187, 190, 193-5, 197-8, 201, 204, 206-8, 210-14, 217, 219-22, 228-9, 234-242, 249, 256-7, 264, 267, 269, 270-4, 278, 284, 290, 303, 305, 320-1, 350, 352, 380.

<sup>485</sup> See Pupin, *Immigrant*: 63, 129-30, 133, 135, 138, 140, 150.

<sup>486</sup> Hadot, *Veil*, 156.

<sup>487</sup> *Ibid.*, 156.

<sup>488</sup> *Ibid.*, 24.

<sup>489</sup> Pupin, *Immigrant*, 382: "Such beauties abound in every other department of science, and they are in no respect inferior to those which form the subject of the fine arts, like music, painting, sculpture, and poetry.

### 3.1.1. Likely fables: *noein* vs. *empiricism*

If the universe is a poem, a poet can unveil the meaning by composing a poem. The ancient idea dictates that the poet has power of the recreating what he sings.<sup>491</sup> What philosophers like Heidegger and Gadamer and critics like Burke and Davenport see is that man has lost his agency—his participation—with nature. According to Gadamer, “going along with” something means that there is no neutral standpoint—a perspective held by both Said and Auerbach.<sup>492</sup> Scientific rigor has eliminated the subjective point of view. Sartre saw this as disastrous: the objectifying gaze is not mutual, communication ceases. What is more, how could it be possible to step outside of the world in order to observe it as an object of study? “We are in the world as we are in language.”<sup>493</sup> It would seem, then, that the objectifying gaze would rip man from his cradle—which can almost be taken literally today, if by cradle, the cradle of civilization is meant.

In the Platonic conception, as we have seen and will see again, it is the world of individuals that is always changing; ideas, though, exist outside the mind. It has been argued that the ‘direction of the gaze’ (seeing indirectly, looking within) has changed radically over time, and may have once meant more than reflection, implying an instinctive openness. This could be connected to the concept of *noien*, which Gadamer writes is usually translated as meaning thinking, although the primary meaning of the word is, “not to become absorbed in oneself, not reflection, but, on the contrary, pure openness for everything”, adding that the etymology leads to the senses of the animal, “which notices the presence of something by its scent and without any more exact perception. This is how we must understand the relation between ‘thinking’ and being ... in *Parmenides* ... *noein* is mentioned with particular emphasis alongside the other features of being.”<sup>494</sup>

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To cultivate the beautiful in science, is, according to my view, the second ideal of the many loyal workers associated in the National Research Council. Will that kind of science interfere with the spiritual development of our national life?”

<sup>490</sup> Pupin, *Immigrant*, 102, 76-7.

<sup>491</sup> Gadamer, *Beginning*, 202-5.

<sup>492</sup> Said, introduction.

<sup>493</sup> Hadot, *Veil*, 313.

<sup>494</sup> Gadamer, *Beginning*, 70.

The point in Platonism isn't that ideals are unchanging, but that the subject lives in a changing world of appearances. It would do, then, to make some distinctions between the different ways in which we perceive the universe around us. It was Kant who wrote that mathematics was the only science with exact definitions, which may be compared to the Platonic view that mathematical objects are unchanging *eidōs*, forms, with no variation in place or time. In Kant's work, as a whole, this mathematical analysis is presented alongside consideration of 'being' and 'ought' and what they mean in terms of freedom. This range of concerns can also be found in ancient Greek works, which may have been broader ("total")<sup>495</sup> in their comprehension than parameters of modern thought.

As already explained, the importance of mimesis can be found in its definition as the imitation of the *mathematical* star dance of heavenly order.<sup>496</sup> That some Victorian scientists were aware of this is indicated by Maxwell's statement that man can interpret the language of Nature, but by no means emend her expressions.<sup>497</sup> He writes that man's theoretic, imaginative faculty is greater than reason in that it can *apprehend and artistically reproduce* natural beauty.<sup>498</sup> By contrast, "Analysis, cruelly anatomical, names for distinct nouns, separates a distinct faculty by saying it is not intellectual, and then by reasoning blindfold every philosopher goes up a tree, finds a mare's nest and laughs at the eggs, which turn out to be pure intellectual abstractions in spite of every definition."<sup>499</sup>

Unity of the universe and how it is perceived is in the "pure openness for everything".<sup>500</sup> In Plato's works like the *Timaeus*, we see the theoretic, imaginative faculty given precedence over the narrow, analytic. The "everything" is symbolic in nature, and as already seen, the symbolic allows for higher and higher levels of abstraction for the purpose of reaching higher truths or the good life. Maxwell appreciated how Plato's *Thaetetus* showed Socrates using symbols for thought, and how dialogue was employed in the place of analysis. In other words, in addition to the theatrical dialogue, an abstract component is

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<sup>495</sup> As per Arnold's suggestion that modern man become more perfect through attention to his "totality" – via what he rather aptly defined, for our conversation here, "Hellenism."

<sup>496</sup> Gadamer, *Relevance*, 36.

<sup>497</sup> Campbell, *Maxwell*, 131.

<sup>498</sup> Ibid.

<sup>499</sup> Ibid.

<sup>500</sup> Gadamer, *Beginning*, 70.



added, which—as seen in the first chapter—is a means by which to increase the meaning of a message. One of Maxwell’s more amusing lines from the poems he composed describes, “the wranglers playing with the symbols”. Indeed, whenever there is a higher intellectual facility, thinkers may get bogged down with literature that is more heavily ornamental, less abstract. Maxwell, also a decent poet—as will be described below—was critical of the “tyranny of words”, freedom from which “literary men never attain”. Faraday took a similar stand: praising himself for not falling into the emptiness of children’s tales, like a 1001 Nights.<sup>501</sup> The “tyranny of words” is the inability to extract out of experience the truly meaningful. It will be argued that through such a stand on language, scientists like Maxwell, Faraday, and Pupin were as poetic as was Plato. That we are as “cruelly anatomical” as to only find poetry in some form of verse, as opposed to finding it in nature,<sup>502</sup> is a sign of the poverty of this age: the power and purpose of poetic language is so much more.

The modern incarnation of *techne* is in technology: where material acts on behalf of man, divorcing him from his creative role. In its role to master life, the scientific perception is arguably static in that it excludes participation. It has been argued that such an understanding of science or technology is purely semantic,<sup>503</sup> but Heidegger has shown how it informs our experience. Does the ‘semantic’ argument perhaps not predict Kristeva’s urge for the talking cure: to reconnect our drives with our expression? As it is, our expression is often dictated by technology.<sup>504</sup> Gadamer writes about how man’s participation in both society and abstract values has been precluded by science: “Science wants to become master of its object by means of a method and thus exclude that mutuality of participation existing between object and subject that represents the highest point of Greek philosophy and makes possible our participation in the beautiful, good and the just as well as the values of communal life.”<sup>505</sup>

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<sup>501</sup> He could have believed the Arabian Nights... as a child “But facts were important to me and saved me”, qtd. in John Tyndall, *Faraday as Discoverer*, accessed August 6, 2012, <http://www.gutenberg.org/files/1225/1225-h/1225-h.htm>.

<sup>502</sup> See Davenport, *Geography*, 238-247, and his account of Agassiz’s nature writing.

<sup>503</sup> Mayr, “Science,” 668.

<sup>504</sup> E.g. Zolla, *Eclipse*.

<sup>505</sup> Gadamer, *Beginning*, 69.

For the Greeks, “the essence of knowledge is the dialogue and not the mastery of objects comprehended as proceeding from an autonomous subjectivity, that victory of modern science that has even in a certain sense led to the end of the metaphysics.”<sup>506</sup> Pupin’s autobiography bridges this divide, being at once about modern science but also adhering to the classical view of metaphysics. However, given that it is also an autobiography, it can be read as the fiction of self in the modern context where subjective experience has been demoted to such a realm of fancy. It raises the problem of genre given the confines of specialization that emerged in the 20<sup>th</sup> century that have precluded general notions of participation as outlined above and that will be described in more detail below.

Scientific rigor has eliminated the subjective point of view.<sup>507</sup> An illustration of this is that while our subjective experience is that the sun “rises” from the East, in fact, it is the earth that is rotating. By extension, the hypothetical neutral standpoint has eliminated the knowing subject.<sup>508</sup> Contemporary culture was thus founded in opposition to reality upon the independence of the subject which reflects upon itself (here, we return to the modern direction of the gaze: within). It is precisely this modern culture from which springs the “aggressiveness” of understanding science, which seeks mastery, not dialogue.

While the perspective of the humanities cannot be extended to the sciences, the scientific perspective has been wrought over the social sciences, with great effort.<sup>509</sup> It is argued by classicists and an ever fewer number of professors of the humanities that it is inappropriate to apply scientific techniques to cultural and social life: the scientific approach is not entirely without merit, but what it lacks is the potential to constitute a more holistic meaning. Sartre warns of the disaster of the objectifying gaze;<sup>510</sup> Wittgenstein reproaches modern science for giving the impression that everything has been explained, but this is not the case, for we cannot step outside the world in order to treat it as an object

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<sup>506</sup> Gadamer, *Beginning*, 70.

<sup>507</sup> *Ibid.*, 32.

<sup>508</sup> *Ibid.*, 32.

<sup>509</sup> Barry Barnes, “The Science-Technology Relationship: A model and a query,” *Social Studies of Science* 12, no. 1 (February 1982): 166-172, especially 170-171, accessed August 6, 2012, <http://www.jstor.org/stable/284894>.

<sup>510</sup> Gadamer, *Beginning*, 32.

of study. We are in the world as we are in language.<sup>511</sup> Different fields in the humanities have recognised the loss of man's *poesis*: through the exclusivity of science is the creative power to co-create. Mumford raises the interesting question of whether just anyone is qualified to make use of the machine: "For mark this: only those who live first and who keep alive have earned the right to use the machine. Those who use machinery because they are incapable of facing the stream of life and directing it ... [become] mere attachments to a mechanical contrivance."<sup>512</sup> For Pupin, anyone could use the machine, or the power of heat, but such would not yield their full potential to the evolution of man unless he were to yield to the greatest moving power in the spiritual world, the stars of which should be listened to for it is they that are immortal and can power inventions that are merely made by the hands of mortals and transitory.<sup>513</sup>

In contrast to exaggerated scientific rigor is a different methodology: the subjective point of view defined by the word *methodus*, which in ancient times did not mean to objectify, dominate, but to work within a certain domain of question or problem—a "going along with" that implies no neutral standpoint. It did not signify objectivity as much as, "a human encounter with an other, different from self, a 'taking part' like a believer faced with a message".<sup>514</sup> The human encounter is not to be minimalised if we are to consider the consequences of favoring the rational over the emotional. Burke explains that rational categories are not the same as emotional ones: a lion can both symbolize a father, and the cat family.<sup>515</sup> He argues that where the symbols are incongruent, anguish and unrest will result if the rational is embraced. Poetry may not be rational, but what would the world be without poetry, even if poetic writing defies strict classification by genre?

In the classical view, *theoria* was valued higher than progress. Man's ultimate goal was to be able to articulate his place in the universe by recreating the heavens as best he could, through the process of *techne*. Today, we have a different picture. In the humanities,

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<sup>511</sup> Hadot, *Veil*, 313.

<sup>512</sup> Lewis Mumford, "The Metropolitan Milieu," in *Mumford on Art in the 1930s*, ed. Robert Wojtowicz, (Berkeley, LA: University of California Press, 2007), 52.

<sup>513</sup> Pupin, "Fritz".

<sup>514</sup> Gadamer, *Beginning*, 32.

<sup>515</sup> Kenneth Burke, *Permanence and Change: An anatomy of purpose*, (Berkeley, LA: University of California Press, 1984), 72-3.

postmodern thought stands more as a fragmented, half-mute poem of fear that emerged in response to the modern shift of power and priorities. Lacan finds the key between the signifier and signified in mental hospitals, where he reconnects words with sick patients through the talking cure. Could we say, on some level, that contemporary society is mute? Not literally mute, but mute to participation, mute to the cure that would bring man perception of his true place in the universe. After the horizon shifted from the sun rising in the East, when man could no longer believe his eyes, he became mute to expressing his experience, not believing in anything anymore, least of all his subjective experience. Which led to violence, both towards himself and to the world around him. The horizon only broadened for the expert, yet even then, only within his field: for the average man, his reality shrank to things without meaning that he felt unqualified to describe, causing him to fall silent.

Each age has its *weltgeschichte*, we have prejudices rooted in our tradition, in the same tradition that we seek to bring to language as we interrogate a text.<sup>516</sup> Perhaps our tradition has expelled us from the land due to our scrutiny. Man is now like Prometheus because the entire world rested on his shoulders since he took it on himself, claiming he could objectify it through his rigorous scientific gaze and make it submissive to his desire. But the ancient Greeks had a word for the bird's-eye perspective: hubris, the pride that cometh before the fall, rather like Icarus flying—thanks to an invention—too close to the sun. Such stories have been cast aside as fairy tales, yet even a hundred years ago, scientists were not so fast to discard the myths, even using them in their own narratives, as Pupin does. And if, as so many philologists and philosophers have shown, the myths are not mere stories, but rather lessons in humanity, to discard them is to reject that which has already been known, learned through hard labour and experience.

An example of what has been lost is the warning of the muse: while she has much to teach, she will say much that is false. Plato insists that his works on natural processes are “likely myth” and “likely fables”.<sup>517</sup> This coheres with Pupin's autobiography, which

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<sup>516</sup> Gadamer, *Beginning*, 47.

<sup>517</sup> Hadot, *Veil*, 157, cites Plato's *Timaeus*, 29c, “If, then, on several points and many questions – the gods and the generation of the universe – it is impossible for us to propose explanations that are completely coherent within themselves in every point and perfectly exact, don't be surprised! But if we come upon

presents the fable of a life and work devoted to ideals: because of the presentation of ideals, it could take on a propagandistic hue for some readers unfamiliar with the classical approach to texts wherein they were viewed as “likely” or later, during the Renaissance, as didactic models explicitly focused on the praiseworthy. In the *Timaeus*, the starting points are axioms indemonstrable in themselves, but capable of constructing *reasonable and likely* representations of the universe, that is, ultimately, to ‘invent it’.”<sup>518</sup> Plato’s ironic formulation of the error that occurs in intellectual pursuit, that even the fastest runner can be overcome in the race, also appears in Aristotle’s works on the natural world: *Physics* and *De anima*.<sup>519</sup> The ancient, mythical-poetic idea warned that the truth is single, and opinions, multiple.<sup>520</sup> This concept can be seen again and again,<sup>521</sup> until Victorianism: it is retained in the Christian proverb about the weeds that are bound to crop up in our harvest of the wheat.

While the illustration may appear too simplistic, it illustrates Porphyry’s view that traditional religion was really physics in pictures.<sup>522</sup> It also shows an aspect of the poetic that has been lost: the metaphor, the reading—of a book, of life—that informs one’s actions. If Gadamer is right that in the culture of late 19<sup>th</sup> century, the value of the poetic was unheeded, even under the influence of Nietzsche’s interest in Orphism, and underestimated in the framework of culture and mythical religious aspects, it seems that Heidegger was right about the loss of *poesis* through a technology where the *techne* is not the creative act of the man, but the machine. The measure of man and his work is no longer a celestial ideal so much as a relative measurement in terms of what is earthly achievable, and therefore in no need of pictures once technology is able to do the explaining; man is made redundant by fact. As such, Pupin’s autobiography, in this new context, might

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some that do not yield to any others in likeliness, we must be satisfied with this, remembering that I who now speak, and you who are my judges, are mere human beings.” Aristotle, in his *Poetics*, explains that only a god could give the true account of history, which in man’s account should be conveyed in a poem (not history) for it tells us what could have or should have happened, also see 157-8.

<sup>518</sup> It has been noted that this approach is also used in some contemporary science: see Luc Brisson and F. Walter Meyerstein qtd. in Hadot, *Veil*, 159.

<sup>519</sup> Gadamer, *Beginning*, 96.

<sup>520</sup> Ibid., 99-101. We ought to heed that warning even more as Gadamer pointed out how these opinions, even when ostensibly based on knowledge from the past, can be misinformed, as seen in how Heidegger misread certain passages from antiquity, *ibid.*, 87, or how ideas become distorted through doxography, *ibid.*, 81.

<sup>521</sup> Ibid., 96.

<sup>522</sup> Hadot, *Veil*, 73.

becomes interesting to the typical contemporary reader for new reasons: because its ultimate genre is ambiguous, and is read by this reader not in terms of ideals but propaganda; not the spiritual but the fable; not presenting a model but presenting fantasy.

A digression must be made in terms of the influence of presocratic philosophy on modern texts on pseudo-scientific work in the humanities, which, more specifically, draw inspiration from the type of fragment found in Heraclitic sayings. These fragments, like pseudo-oracles, are not viewed within their original framework but taken outside for the shock of exposure to the unknown: letting the text speak for itself in its poetic brevity. In many ways, postmodernists like Deleuze and Guattari could be viewed as Heraclitic poets: the very concept of the rhizome is fragmented, as are their lines of departure—not to mention schizophrenic thought. Or the notion of copies of copies, circulating in a universe without order. To view such writers within the context of the poetry shards of the shock of modern man relieves the psychic burden one might otherwise feel if they were to take their writings literally.

To view their writings as a modern myth, or song, can bring to these authors an interesting place in the continuum of history (as opposed to fragmented, chaotic time—the explosion of the narrative structure, which Barthes declared dead, and resurrected again in the lectures preceding his death). In many ways, *Mille Plateaux* is the modern—*fragmented*, psychologically challenged—myth, with metaphysics and all, its bodies without organisms, some of which are cancerous, along with its counterpart, *The Anti-Oedipus*, which combines the psychiatric ‘science’ of schizophrenia with modes of capitalism. It is hard to ignore the interplay of myth and scientific metaphor. Davenport, in his essay “The Symbol of the Archaic”, has argued that “There is nothing quite so modern as a page of any of the pre-Socratic physicists, where science and poetry are still the same thing and where the modern mind feels a kinship it no longer has with Aquinas or Newton.”<sup>523</sup> He cites a moralizing fragment: *Ethos anthropoi daimon*—and localizes this guiding spirit, or daimon, in Heraclitus himself: “In Heraclitus our most representative writers discovered a spirit congenial to their predicament as modern men”—Heraclitus is the genius loci in Hopkins, Spengler, Pound, William Carlos Williams, Eliot, Olson,

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<sup>523</sup> Davenport, *Geography*, 21.

Gertrude Stein, also Wittgenstein.<sup>524</sup> The problem here is that the scientific aspects of such Heraclitian myth through scientific fragment is relegated to the humanities (shattering them through lack of clarity)—or even further, to the academically contested realm of science fiction, where order is restored at the outskirts of academia. Where scientific metaphor is today used in the poetic narrative of the humanities, it is debatable how much, if at all, such poetic narrative is allowed an equal-footed dialogue with science. Or, like Deleuze and Guattari wrote: “We have painted the [scientific] world on ourselves, but not ourselves on the [scientific] world.”

While scientists like Pupin and to some extent Tyndall retained a poetic approach to their writing throughout the end of the 19<sup>th</sup> century, it is argued here that such discourse ceased in the early 20<sup>th</sup> century partly due to socio-political changes, which colour the end of Pupin’s autobiography, least favoured by critics. In many ways, when Pupin picks up Rowland’s term of “pure science” he also means, if we look at the larger conceptual framework in which he discusses science, a co-creative act not unlike Plato’s creative act in writing about creative nature: Pupin seeks to learn God’s language to better understand God, “as star speaketh to star” and in this sense, his autobiography is a tribute to the ancient concept of mimesis and the ancient Greek attempt to reach knowledge. As this is never a final destination, poetry shows what could or should occur, through a focus on ideals. The poetic, here, is intuited—connected to *noein* because the language that is arrived at is not the in-product of a mind as much as it is a reflection of what are taken to be already existing truths. Thence the problem of deciding on a genre for Pupin’s autobiography, which seeks to reflect universal truths (about the ideals of science and inter-cultural relations) that are primarily holistic and poetic.

Similarly, Maxwell viewed the theoretic, imaginative faculty as playing a greater role than reason, as it can ‘apprehend’ and artistically reproduce natural beauty.<sup>525</sup> In this sense, while the scientist might not actually be composing a poem in words, if, as Maxwell explains, he can, like Socrates in the *Thaetetus*, have a symbol for thought,<sup>526</sup> it is

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<sup>524</sup> Davenport, *Geography*, 21.

<sup>525</sup> Campbell, *Maxwell*, 131.

<sup>526</sup> *Ibid.*, 106.

conceivable for science to be a poem.<sup>527</sup> If the universe is a poem, only a poet, i.e. a person who can see sameness in difference, symbols, etc., can unveil the meaning by composing a poem, which can also be poetic prose: it has been pointed out that if in ancient Greece there were no spaces between words, capital letters, or punctuation, even in poetry,<sup>528</sup> as there are today, our view of texts has more formal distinctions than it perhaps needs. Maxwell objected to the strict formalism that would separate things out for their surface value—not essence.<sup>529</sup> And while Maxwell argued that science should never be used to demonstrate religious principles and that religion was private, to observe his recreational written work is to recognize how deeply it was pervaded by these different ways of looking. In this respect, he can be contrasted with Tyndall, who in an 1881 conversation exclaimed: “Let the scientific men stick to their science, and leave philosophy and science to poets, philosophers and theologians!” Yet exclusivist views often lead to self-imposed isolation. Jules Verne in his 1863 novel, *Paris in the 20<sup>th</sup> century*, describes how the poetry of the age is supplanted by the jargon of science. The protagonist Michel decries the dominance of, “science and industry here, just as at school, and nothing for art!”

To recognize a proper value for the aesthetic approach to nature necessarily also means introducing an emotional and irrational, not necessarily schizophrenic, Deleuzian, element into the relation between mankind and nature. This element is present so long as discourse on nature is presented mytho-poetically, if poetry is taken to mean more ‘intuited’ than the product of a mind. Tyndall himself, in his work on Faraday, wrote (what Pupin often wrote) that we “would expect science to be passionless, cold, dry light of the intellect. Not always—man carries heart in all things and cannot separate the moral and emotional from the intellectual.” As we have seen, this is a classical view of man’s relationship to the universe. The truth about the universe can only be transmitted to the person who is pure, chosen, or ready—as per the ancient system of allegory can only be understood by a person

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<sup>527</sup> Campbell, *Maxwell*, 106. For here, Maxwell is considering essence, which can be boiled down into words, and even further into symbols. He writes that Socrates has a symbol for thought; he used dialogue to replace analysis. And yet, while he values words, he is wary of the “tyranny of words” which obstruct literary men from dealing with law, order, etc., *ibid.*, 164. In other words, the methodology is varied – but he, as a scientist, explains it can be done through words.

<sup>528</sup> Davenport, *Force*, 29.

<sup>529</sup> Campbell, *Maxwell*, 131, “Analysis in cruelly anatomical names for distinctions, separates a faculty by saying it is not intellectual, and then by reasoning blindfold every philosopher goes up a tree, finds a mare’s nest and laughs at the eggs, which turn out to be pure intellectual abstractions in spite of every definition.”



with an imagination or sympathy. Plotinus has a modified view of this whereby the nature of the All could be received so long as one “fashioned some object which, by means of sympathy, was capable of receiving a part thereof”.<sup>530</sup> This is the last point that will be made about the gap between a more ‘ancient’ approach to the nature of the world, and the contemporary one: that a place be left for the emotional and even the irrational. Even the peasant in the Middle Ages could appreciate the power of turning things upside-down temporarily in the role reversals of the carnival. Any similarity of *noein* to the animal instinct should not necessarily mean it ought to be labeled ‘primitive’ or ‘superceded’ in our minds. After all, Burke defines us as symbol-using animals. But science, with its agenda of progress, seeks to deny man’s animal nature, while not resolving its brutal manifestation through war. The scientific privileging of empiricism over *noein*; poetry; myth denies important aspects of experience and has distanced us from the language of the stars that is a recurrent motif in Pupin’s autobiography.<sup>531</sup>

### 3.1.2. Analogy and allegory as guidelines

It was mentioned earlier that Pupin’s autobiography begins with “immemorial” tales, symbolic stars, and epic poetry: reflective of what today might be termed as lore, though a case can be made for its relevance. Serious precedents may be found for this kind of writing, involving particular or specific illustrations of cross-temporal, inter-cultural, multi-disciplinary ideas, which draw on the poetic to be expressed. The Renaissance thinker Giambattista Vico considered that in ancient Greek and Roman cultures, like in Biblical culture, reason was not overcome by the poetic; rather, poetry would moderate reason’s impulses and thus safeguard civic life. One has only to think of the image of the Delphic Charioteer: restraining his emotions on his victory: the reins he grasps almost a twofold figurative symbol. Here, the poetic has been expressed through analogy.

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<sup>530</sup> Hadot, *Veil*, 73.

<sup>531</sup> This was explored in most detail starting on pp. 93 of this work.

It does not seem popular knowledge today that Francis Bacon upheld a moral compass as he embarked on scientific discovery; his views are often misunderstood, or changed to fit changing scientific agendas. Bacon is closer to the Victorians than to us not only in time but also in the techniques he used to write about science: his magnum opus on scientific procedure, *The New Atlantis*, reads more like a myth than scientific tract, abounding in allegory for educational purposes. The use of allegory may also be found in his work *The Wisdom of the Ancients* where he writes: “parables serve as well to instruct or illustrate ... every man, of any learning, must readily allow that this method of instructing is grave, sober, or exceedingly useful, and sometimes necessary, in the sciences, as it opens an easy and familiar passage to the human understanding, in all new discoveries that are abstruse and out of the road of vulgar opinions. ... in the first ages, when such inventions and conclusions of the human reason as are now trite and common were new and little known, all things abounded with fables, parables, similes, comparisons, and allusions, which were not intended to conceal, but to inform and teach.”<sup>532</sup>

Erasmus Darwin also heavily employed allegory in his two pseudo-scientific poems, one of which, *The Botanic Garden*, was an imitation of a 1735 poem by Henry Brooke, *Universal Beauty*. His poetry was admired by Wordsworth though Coleridge was more critical (writing: “I absolutely nauseate Darwin’s poem”—i.e. *The Temple of Nature*). In *Garden*, he describes a stamen and pistil as bride and groom. In *Temple*, the preface denies the scientific aspect of the work, though it is very much present, and historically could be viewed as one of the introductions and associations of pantheism to discussion of the universe, via fourth-century Pelagianism (that man’s will requires no recourse to divine intervention). He begins *Temple* with a passage from the *Aeneid* of Aeneas’ journey to the underworld, which can be seen as a symbol for the belief in that form of reincarnation. Lest the reader suspect that such symbols had no underlying contextual connection to the belief of the poem, behold part of the preface: “In the Elusinian mysteries the philosopher of the words of Nature, with the origin and progress of society, are believed to have been taught by allegoric scenery explained by the Hierophant to the initiated, which gave rise to the

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<sup>532</sup> Francis Bacon, *Bacon’s Essays and Wisdom of the Ancients* (Boston: Little, Brown, and Company, 1884), accessed August 6, 2012, <http://archive.org/stream/baconsessayswisd00bacoiala#page/n7/mode/2up>, pp. 321-2.

machinery of the following poem.” From this example, it is hopefully clear why it is so hard to divide out (a) genre (science/poetry) and (b) the belief systems underlying both. This is the case that is being made about Pupin’s autobiography, that it defies the reductionism of over-specialisation.

Ernst Krause, who wrote the *Life of Erasmus Darwin*, explains how in addressing the meaning of nature and the incessant struggle in nature, one expects a solution from the poet “so near to it, but it is only a presentiment of the truth, not the truth itself.”<sup>533</sup> Hence the introduction, which while denying its role as a work of reason, nevertheless asks serious questions to which answers are indeed given: through allegory. “The Poem, which is here offered to the Public, does not pretend to instruct by deep researches of reasoning; it’s aim is simply to amuse by bringing distinctly to the imagination the beautiful and sublime images of the operations of Nature in the order, a the Author believes, in which the progressive course of time presented them.”<sup>534</sup>

Similarly, Robert Chambers, the author of *Vestiges*—considered to be the forerunner of *On the Origin of Species*, was less concerned with the empirical accretion of fact than the poetry of invisible forces.<sup>535</sup>

In Pupin’s time, Tyndall, in his work *On the Study of Physics*, claimed that natural forces were best described through analogies if to engage the mind.<sup>536</sup> Faraday wrote, “I am struggling to exert my poetical ideas just now for the discoveries of analogies and remote figures, for I think that is the true way (corrected by judgment) to work out a discovery.”<sup>537</sup> The notion of translating science became a Romantic paradigm: for example, Dickens had translated what he knew about scientific concepts and the language shape of his own ‘poetic science’.<sup>538</sup>

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<sup>533</sup> Ernst Krause, *Life of Erasmus Darwin* (New York: D. Appleton and Company, 1880), 205, accessed August 6, 2012, <http://www.archive.org/stream/erasmusdarw00krau#page/n7/mode/2up>.

<sup>534</sup> Darwin, preface to *Temple*.

<sup>535</sup> Winyard and Furneaux., “Dickens, Science.”

<sup>536</sup> Tyndall, *New Fragments Vol. I and II*.

<sup>537</sup> Ostry, “Social Wonders,” 55.

<sup>538</sup> John Parham, “Dickens in the City: Science, Technology, Ecology in the Novels of Charles Dickens,” 19: *Interdisciplinary Studies in the Long 19th Century* 10 (2010), accessed September 5, 2011, [19bbk.ac.uk/index.php/19/article/view/529/689](http://19bbk.ac.uk/index.php/19/article/view/529/689). Davenport writes, “Thought at its beginning was always, as

Thence we see that a variety of authors with different ontological beliefs saw the value of the allegory, and attempted to combine the sphere of science and poetry—as did Lucretius, to whom many such writers were indebted.

The role of symbolism and poetry was not necessarily used to safeguard society, as Vico argues it should, but rather as a way to lead the public to very specific ideologies. For instance, Erasmus Darwin was arguably the first to propose and consistently carry out a well-rounded theory with regard to the development of the living world in an ostensibly “amusing” poem.<sup>539</sup> Krause views similar attempts made by Buffon, Linnaeus, and Goethe as confused attempts. “It is the idea of a power working from within the organisms to individual needs, to work towards the perfection of Nature, as a whole.” This progress was not precalculated, nor foreordained. “All organisms are no longer merely wheels in a giant machine made once and for all, incapable of improvement.”<sup>540</sup>

Such an atmosphere would strengthen the claims of those Victorian scientists who spoke disparagingly of so-called classical expressions of poetry and allegory. A peculiar example is Hunt’s *Poetry of Science*: the book, while being quite poetic in style, ultimately argues that the place of science with respect to poetry is far superior.

In contrast to this are those scientists whose use of poetry and allegory defended different views, usually ethical or religious. An amusing example can be found in one of Maxwell’s poems, to be discussed in more detail below: “The British Association—like Leviathan worshipped by Hobbes, The incarnation of wisdom, built up of our witless nobs, Which will carry on endless discussions, when I, and probably you, Have melted in infinite azure—in England till all is blue.”

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far as we know, nurtured by a fanatic search for analogies, creating a poem in which flowers, girls, trees of certain kinds, sea shells, the moon, song birds, embroidery, ribbons, cats, dill, the left hand, fire, virginity, and springs are all kin,” *Geography*, 264.

<sup>539</sup> Krause, *Erasmus*, 211.

<sup>540</sup> Ibid.

### 3.1.3. Divine aside

At this juncture, and now that we have mentioned the azure, an aside might be to address the religious component that shaped some scientist's understanding of the world—also to weave this theme, so present in Pupin's autobiography, through this work, too. Bacon considers, like Pupin, that philosophy is to serve man as well as to temper him and safeguard civic life. For example, he clearly states in *The New Atlantis* that a preoccupation with material concerns and self-centeredness leads man to his downfall: man is rather to study creation to know the Creator.<sup>541</sup> *The New Atlantis* presents an instauration of the spiritual and intellectual (natural philosophy) towards a reverence of nature. What is more, the text warns that if pride replaces piety, science and technology will become sterile and self-destructive. Such moral concerns, as well as Bacon's intent to assist man in his knowledge of nature are conveyed with the assistance of parables and myths.

While his work was highly influential to the founders of the British Association for the Advancement of Science, it is pertinent to note that there was a gaping ideological difference between those members who could be termed atomists, and—as per Huxley's new phrase—agnostics, and those who took a more theological view. Bacon's views are arguably often read out of context by the former. The latter included Whewell, whose *Third Bridgewater Treatise*, despite being slanted by a quotation Darwin took out of context, ultimately argues that the more the (mathematical, scientific) laws of nature were studied, the more evidence one would garner that a Divine Law-giver indeed exists. This is comparable to Bacon's views in *The New Atlantis*. Though more will be said of this in the appropriate chapter, Whewell took the classical views that ideas are “shadows” of Divine Ideas emphasizes the degree of classical thought (and its mytho-poetic unity) that pervaded the thought structure, at least in its written expression, of many early scientists. Similarly, in one of Maxwell's poems, a verse reads: “Is our algebra the measure/ of that unexhausted treasure/ That affords the purest pleasure/ Ever found when it is sought?/ Let us rather,

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<sup>541</sup> Francis Bacon, *The New Atlantis* (London, 1627), accessed August 6, 2012, <http://www.gutenberg.org/files/2434/2434-h/2434-h.htm>, there are no page numbers for this kind of gutenberg.org text.

realizing/ The conclusions there arising/ Nature more than symbols prizing/ *Learn to worship as we ought.*”<sup>542</sup> In the words of Davenport: “Religion, science, and art are alike rooted in the faith that the world *is of a piece*, that something is common to all its diversity, and that if we knew enough we could see and give a name to its harmony.”<sup>543</sup> It is the poetic approach, even where it is embedded in narrative, that by default of its attributes like the metaphor make bridges to allow this unity to be complete. As the highest abstraction in poetic language is God, the greatest unity would come from a hierarchy with God at the top.<sup>544</sup>

Here we may return to—and remember—the *Timaeus*, which was one of the works Maxwell read and commented on to be recorded in Campbell’s biography, which Pupin pored over. In many ways, this literary work on natural investigation is a model of future scientific theories because its starting point is in axioms that are indemonstrable in themselves but capable of constructing a reasonable and likely representation of a universe, i.e., ultimately to co-invent it. The work is almost self-consciously at once scientific, philosophical, and artistic,<sup>545</sup> but above all it is about the beautifully orderly universe, planned and constructed by a Craftsman, whose Intellect mankind is encouraged to emulate.

### 3.1.4. The learned/experienced are more likely to make metaphors

As Arnold writes in *Culture and Anarchy*, it is all too easy for man to develop a “love of machinery”, thinking our totality rests entirely in culture or religion—or science.<sup>546</sup> The over-valuing of machinery stems from “faults of animality”, making a failure of a system that once helped mankind, spreading hatred and confusion.<sup>547</sup> At the dawn of the age of

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<sup>542</sup> Campbell, *Maxwell*, 311. Emphasis added.

<sup>543</sup> Davenport, *Geography*, 270. Emphasis added.

<sup>544</sup> Ricoeur, *From Text*, 99, the “arrow of meaning” gathering together all the significations give the word ‘God’ a density that the word being does not; it eludes hermeneutics. Also see Burke, *Language*, 46.

<sup>545</sup> Hadot, *Veil*, 159.

<sup>546</sup> Arnold, *Culture*, xxxii.

<sup>547</sup> *Ibid.*, 16.

technology, Pupin was already expressing his wish for advance to be holistic, hence his advocacy of what he termed creative coordination and the holistic ideals (in science<sup>548</sup> and democracy<sup>549</sup>), which was pointed out in earlier chapters of this work.

It seems that the full communicative potential of the written word and its ability to unite different topics on the same cognitive map can only be seen by those with the level of education that affords them true breadth of vision. Thus far, this has been explained through *noein*—an openness, and also through the curiosity and work needed to perceive similarities. The metaphor—the similarities—can only be drawn where both topics being bridged together are understood. This is perhaps why Victorian writing is so compelling: Davenport, after all, recognizes it as a “generation of exact prose”.<sup>550</sup> He quotes Agassiz, Pupin’s contemporary, who explained that the “education of a naturalist now consists chiefly in learning to compare”.<sup>551</sup> Such an approach to writing influenced, in turn, writers such as Pound, Hopkins, and even Ruskin.<sup>552</sup> However, there has been a decline in the ability to draw observations from the natural world. “College students can now scarcely make their way through a poem organized around natural facts. Ignorance of natural history has become an aesthetic problem in the reading arts. Thoreau, though he wondered why the very dogs did not stop and admire turned maples, knew better what the American attitude was, and was to be, toward natural history. Nullity.”<sup>553</sup>

But Davenport points out that while ignorance reigns among “that fiction, the public”, artists have always seen the similarities where there were supposed to be none. He shows the poetry in scientific writing, and the “scholastic definition” in a poem.<sup>554</sup> He claims there is a contemporary “delinquency” in verbal precision that is so profound that many college students and professors would declare the paragraph by a poet describing love, “a hopeless specimen of pedantry, ‘scientific jargon.’ It is unimaginable that these professors or sophomores cannot appreciate the diction which named a jellyfish *Medusa* or

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<sup>548</sup> We are reminded that Pupin reworked some of Tyndall’s scientific goals into ideals, see for example Pupin, *Immigrant*, 321.

<sup>549</sup> This is the final message of his book, *From Immigrant to Inventor*, see the last page:

<sup>550</sup> Davenport, *Geography*, 284.

<sup>551</sup> *Ibid.*, 247.

<sup>552</sup> *Ibid.*, 247, 284, respectively.

<sup>553</sup> Davenport, *Geography*, 234.

<sup>554</sup> *Ibid.*, 238.

chose as Linnaean binomials for Wyoming flora *Artemisia frigida*, *Helenium autumnale*, [etc]. ... *Helenium autumnale* bears its original Greek name, aligning flower and woman in the deep tradition that awed and pleased John Ruskin, and a nineteenth century botanist added *autumnale*, specifying both its flowering season and the botanist's world-weary nostalgia over classical culture, so that one cannot distinguish between the poetry and the science of the name; they are fused – a name fitted with precision into a universal nomenclature for all the *flora* and an image of a tall, aging heroine.”<sup>555</sup>

Davenport argues that a strong claim could be made for scientific writing to take a place within the corpus of imaginative writing, even though “the protectors of letters” would reject it.<sup>556</sup> But were the general level of education broader so as to include more science—even of the natural kind, which teaches the names of trees and strata, it is hard to imagine that such a distinction (between scientific and imaginative writing) could even be made. Maxwell would conceivably argue, even in this context, that it is not enough to have read a description of a topic to make one proficient in it, one must also have “felt” it, as per the Platonic *peri physeos historia*. In his last public speech, “On the Telephone”, he criticized writing produced by authors who had no first-hand experience with the subject, as such writing would lead readers astray. (We know that Pupin had firsthand experience with nature: his first chapter explains his experience as a cowherd in Idvor; what is more, he cited the importance of direct experience in his autobiography.<sup>557</sup>) To explain and elaborate, Maxwell quotes William Harvey: “For whosoever they be that read authors, and do not, by the aid of their own senses, abstract true representations of the things themselves (comprehended in the author's expressions) they do not represent true ideas, but deceitful ideas and phantasmas; by which means they frame to themselves certain shadows and chimaeras, and all their theory and contemplation (which they call science) represents nothing but waking men's dreams and sick men's phrensies.”<sup>558</sup> This is no small point, and one enthusiastically addressed in the alternative education systems dreamed up by

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<sup>555</sup> Davenport: *Geography*, 238-9.

<sup>556</sup> *Ibid.*, 234.

<sup>557</sup> Pupin, *Immigrant*, 205, quoting Tyndall: “Indeed, it may be doubted whether the real life of science can be fully felt and communicated by the man who has not himself been taught by direct communion with nature.”

<sup>558</sup> Campbell, *Maxwell*, 190.



Rousseau, Tagore, and Tolstoy. It was also one of Nikolaj Velimirović's criticisms of literary critics who, on the long train ride through history, get tired and start mistaking rural stations for big town fairs. Their boredom becomes pleasurable and this pleasure is enough to deceive people. Such writers are drawn to the art by "kičljivost i sujete" and their writing is "šarenom lažom".<sup>559</sup>

To recap, then, without a feeling for or participation with nature, without walking among the trees oneself, one has no authority to write about them—or deny their connection to the imagination. To return to Maxwell's "Telephone" speech, we can see the breadth of his "own senses", which undeniably include the imaginative in terms of his breadth, (natural) comparisons, and even humour: "We are too apt to suppose that we are congregated here ["In a University"] merely to be within reach of certain appliances of study, such as museums and laboratories, libraries and lectures, so that each of us may study what he prefers. I suppose that when the bees crowd round the flowers it is for the sake of the honey that they do so, never thinking that it is the dust which they are carrying from flower to flower which is to render possible a more splendid array of flowers and a busier crowd of bees in the years to come. One great beauty of Professor Bell's invention is that the instruments at the two ends of the line are precisely alike... The perfect symmetry of the whole apparatus – the wire in the middle, the two telephones at the ends of the wire, and the two gossips at the ends of the telephones, may be very fascinating to a mere mathematician, but it would not satisfy the evolutionist of the Spenserian type, who would consider anything with both ends alike, such as the Amphisbaena, or Mr. Bright's terrier, or Mr. Bell's telephone, to be an organism of a very low type, which must have its functions differentiated before any satisfactory integration can take place."<sup>560</sup>

In his further discussion of the microphone, he continued to praise "the cross-fertilization of the sciences" and described the "classification of all the sounds capable of being uttered by the human voice" which he explained as part of "that untrodden wild between acoustics and music—that Serbonian bog whole armies of scientific musicians and

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<sup>559</sup> Nikolaj Velimirović, "Religija Njegoševa," in *Sabrana Dela*, Knj. 5 (Linc: Pravoslavna Crkvena Opština Linc, 2001), 873.

<sup>560</sup> Campbell, *Maxwell*, 177.

musical men of science have sunk without filling it up.”<sup>561</sup> The reference is to Milton’s mention of the Serbonian bog in *Paradise Lost* (Book II, 592-4): “A gulf profound as that Serbonian bog.../Where armies whole have sunk.” It would be hard to be conclusive about whether the speech is more literary or more scientific. The blending of the fields goes even further towards the end of the speech, where he describes the work being done by the Board of Musical Studies, “vindicating for music its ancient place in a liberal education”. He describes studies “where the wail of the Siren draws musician and mathematician together down into the depths of their sensational being, and where the gorgeous hues of the Phoneidoscope are seen to seethe and twine and coil like the ‘Dragon boughts and elvish emblemings’ on the gates of that city, where ‘An ye heard a music, like enow/ They are building still, seeing the city is built/ To music, therefore never built at all/ And therefore built for ever.’”<sup>562</sup> Sirens and dragons<sup>563</sup> may belong to the *Odyssey*, but the poem cited is Tennyson’s, *The Idylls of the King*—which is tellingly about King Arthur’s attempt and failure to elevate mankind and create a perfect kingdom. It was based on Tennyson’s own observations of nature, and is interpreted to reflect social problems in Victorian Britain. Aside from the ominous undertones of the reference, just as Maxwell was not without his own criticism of some of the trends, scientific or otherwise, of his day, are the tenets—also very much about cross-fertilization—later picked up by Herman Hesse in *The Glass Bead Game*. The latter is very much a novel of ideals, and one which seeks a universal language. “Thought at its beginning is always ... nurtured by a search for analogies creating a poem in which flowers, girls ... are all kin”.<sup>564</sup> But in *The Glass Bead Game*, the poem is abstracted even further, to beyond words. This is in part because it was written in a different age, when man began to become mute, and when symbols began to be emptied their meaning. But more on this later.

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<sup>561</sup> Campbell, *Maxwell*, 178.

<sup>562</sup> Ibid.

<sup>563</sup> At least in Samuel Butler’s translation.

<sup>564</sup> Davenport, *Geography*, 264.

### 3.1.5. A selection of Romantic Victorian narrative on poetic science

Despite the scientific and technological advances that were being made in Victorian times, there were still those who subscribed to Romantic classical values wherein a valid aesthetic approach to nature was to introduce an emotional, sentimental, and potentially irrational element into the relation between mankind and nature. As there are aspects of such in Pupin's autobiography, particularly the emotional and sentimental, such as his mother comparing the tin star on the church to scientific achievement, comparisons to other English-language parallels and precedents will be explored here.

Perhaps the most popular example would be the scientific references in George Eliot's *Middlemarch*.<sup>565</sup> Eliot formed her narrative around certain scientific principles, such as strict, Comtean observation, which the author would apply to his or her own craft: the Comtean belief was that art should faithfully represent the natural order actively knowable through only scientific observation. In other words, "fiction... remains intact... by the same experimental and imaginative sequences as scientific discovery".<sup>566</sup> And of the various scientific approaches taken at the time, it is argued that she took the Whewellian view that meaning can be made of the observable world through empiricism by applying guiding ideas to make the subject matter "sensible".<sup>567</sup> "Just as the scientist observes, records and expounds the laws of nature, so should the novelist faithfully study and report the inexorable operation of natural laws within human society and the fundamental interconnectedness of social relations."<sup>568</sup>

Eliot engages science on three levels: through the ruminations of Dr. Lydgate, optical metaphors, and Darwinistic, evolutionary theory.<sup>569</sup> Although Eliot departs from the scientific into awe for the mysterious in life in this same novel, and in many ways also

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<sup>565</sup> See fn. 1 in Rectenwald, "Construction and Deconstruction."

<sup>566</sup> Ibid.

<sup>567</sup> Ibid.

<sup>568</sup> Winyard and Furneaux, "Dickens, Science."

<sup>569</sup> Rectenwald, "Construction and Deconstruction," – who also posits that she anticipates the discursive shift in scientific theory later embodied in Thomas Kuhn's *The Structure of Scientific Revolutions* and Foucault's *Archaeology of Knowledge*.

critiques science, it nevertheless is representative of the times in which it was written for the scientific to so permeate the prose. Maxwell, in this respect, noted that the characters could be compared to the astronomical and meteorological.<sup>570</sup> We may again be reminded of Pupin's stars, connected to his mother.

As it will be seen, Eliot's criticism of science emerges where it is generalizing or totalizing. This criticism is not unique to Eliot's writing—as it also appears in Arnold, as well as in Peacock's *Gryll Grange*.<sup>571</sup>

Eliot is critical of scientists prescribing to inflated views that keep them from seeing what is in front of them, rewarding characters with this behavior, like Lydgate, with blindness. "Science or the 'objective' observer is given a transcendent power of vision which disqualifies that of the relative subject."<sup>572</sup> In other words, if the scientist himself is removed, "who remains to witness the 'events?'" It is interesting that Pupin's autobiography does not share this problem; his abstractions are those of his ideals, not of his life, which is narrated through the particularities of both Serbian and American soil.

The metaphorical scheme of there being higher values—beyond the scientific gaze—was defended by Eliot, as demonstrated in the preface to *Middlemarch*: "Who that cares much to know the history of man, and how the mysterious mixture behaves under varying experiments in Time, has not dwelt at least briefly, on the life of St. Theresa." In this sense, comparisons can be made between a work like *Middlemarch*, very much crafted on scientific principles but leaving space for the imagination and even spiritual, and Pupin's written work.

In one of her letters, Eliot writes, "But to me the Development theory and all other explanation of processes by which things came to be, produce a feeble impression

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<sup>570</sup> Campbell, *Maxwell*, 199.

<sup>571</sup> In *Gryll Grange*, the criticism is more specifically directed at the bigotry of science, and the idea that through scientific platitudes, the true value of earthly life were being lost – see Rev. Dr. Opimiam's lament at the opening of chapter XIX, and the chorus' fourth song in chapter XXVIII and the dialogue that follows. Thomas Love Peacock, *Gryll Grange* (London: MacMillan and Co, 1896), accessed August 6, 2012, <http://archive.org/stream/gryllgrange00peacials/page/n7/mode/2up>.

<sup>572</sup> Rectenwald, "Construction and Deconstruction."

compared with the mystery that lies under the processes.”<sup>573</sup> What is for Pupin motivation to better understand the language of God through the laws of the universe is for Eliot a more doubtful awareness of the limitations of the applications of scientific metaphors. We may be reminded at this juncture of Pope’s *Dunciad*, in which the downfall of both the arts and the sciences could be destroyed by Cibbers’ lack of imagination and metaphorical vision. Also relevant is the “microscope of wit”, which kept Cibber from seeing the bigger picture, “When Man’s whole frame is obvious to a *Flea*.” It is relevant that the outcome of this “microscope of wit” in the *Dunciad* is the doubt of God, leading man to substitute a “Mechanic Cause” in the Creator’s place.<sup>574</sup> Eliot, too, seemed to see “the microscope of wit” and its ramifications in this passage: “Even with a microscope directed on a water-drop we find ourselves making interpretations which turn out to be rather coarse; for whereas under a weak lens you may seem to see a creature exhibiting an active voracity into which other smaller creatures actively play as if they were so man animated tax-pennies, a stronger lens reveals to you certain tiniest hairlets which make vortices for these victims while the swallower waits passively at his receipt of custom.”<sup>575</sup>

Metaphorical descriptions, Rectenwald writes, are dependent on interpretation. And yet, *Middlemarch* stands as an example of literature highlighting science, for, “Science is invoked to discuss the unfolding of character and plot, and vice versa... Likewise, Eliot can establish a connection between science and fiction in the form of language, and fiction and science make their way into one another.”

*Middlemarch* champions both science and the mysterious: a combination of themes that was not foreign to writers of the day. The epigram in Hunt’s *The Poetry of Science* is an excerpt from Coleridge to the effect that to wonder about existence is to feel “the presence of a mystery, which must have fixed thy spirit in awe and wonder”.<sup>576</sup> These works are highlighted here, because Pupin’s autobiography is also at once a treatise about

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<sup>573</sup> *Letters*, qtd. in K.M. Newton, "George Eliot, George Henry Lewes, and Darwinism," *Durham University Journal* 66 (1974): 278, qtd. in Rectenwald, "Construction and Deconstruction."

<sup>574</sup> Pope, *Dunciad*, Book IV.

<sup>575</sup> George Eliot, *Middlemarch*, (New York: Harper and Brothers, 1873), accessed December 25, 2013, <https://archive.org/stream/middlemarchastu11eliogoog#page/n8/mode/2up>, 23.

<sup>576</sup> Robert Hunt, *The Poetry of Science* (Boston: Gould, Kendall, and Lincoln, 1850), accessed August 6, 2012, <http://archive.org/stream/poetryscience00huntgoog#page/n1/mode/2up>.

science, particularly those seemingly tangential detailed descriptions entirely about his scientific work and not at all about him, and a paean to God whose mystical language scientists can learn if they see the poetry in science.

Dickens also both popularized and critiqued scientific ideals in his works, though his fiction was criticized for not having captured the paradoxes and tides of human psychology, emotions, and relations—and thus failing at its traditional moral task.<sup>577</sup> Feeling is manifested “metamorphically through and between people and things” as opposed to emerging from within the human being.<sup>578</sup>

The science Dickens championed was democratically accessible: designed to stir the imagination, inspire narrative, and unite a reading public. By contrast, Eliot championed science, for its method to more precisely represent reality.<sup>579</sup> The scientist, like the novelist, is to study and report on the natural laws at work in society.

One of Dickens’ most important pieces on science was not in a novel, but in *Household Words*: namely, his review of Robert Hunt’s *The Poetry of Science*, which is a book Pupin attributes to having taught him the value of poetry in science.<sup>580</sup> An interesting connection can thus be made between Pupin and Dickens, via Hunt. Dickens’ thoughts are best considered in this context, for connections can be made between the view he took on Hunt’s work, and how he approached science in his novels. While Hunt seems to refute there being a meaningful connection between poetry and science, Dickens sees the opposite: “Nature is a language that science deciphers”—replacing the superstition of sirens and mermaids with “coral reefs constructed by myriad minute creatures.” Dickens “is evidently less concerned with the empirical accretion of fact and detail than with the poetry of invisible forces... This melding of literary and scientific worldviews illustrates ‘how mythopoeic the Victorian imagination was; how much fact and discovery were seen in terms of mystery and even magic.’”<sup>581</sup>

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<sup>577</sup> Winyard and Furneaux, “Dickens, Science.”

<sup>578</sup> Ibid.

<sup>579</sup> Ibid.

<sup>580</sup> Pupin, *Immigrant*, 102.

<sup>581</sup> David Ackroyd, *Dickens* (London: Vintage, 1999), 699, qtd. in Winyard and Furneaux, “Dickens, Science.”

It could be argued that *The Poetry of Science* itself, though being a book on “science” borrowed from earlier “literature”. Comparisons are made throughout of the kind highlighted by Dickens in his review: “Sirens, mermaids... exist no longer; but in their place, science, their destroyer shows us whole coasts of coral reef constructed by the labours of minute creatures”. Science has “blown to atoms” mythical explanations for natural phenomena and replaced them with equally as imaginative narratives.<sup>582</sup> Hunt himself writes that science leads the intellect to “higher examples”<sup>583</sup>, explaining that Prometheus was an explanation of scientific phenomena that was congenial to the ancient Greeks, “So says the beautiful fiction of the Grecian mind, which appears as a poetic drama or a prophetic glance of a gifted race who felt the mysteriousness they were et unable to describe... Modern science has shown what vastly important offices the solar rays execute...”<sup>584</sup> “Science in explaining the formation of dew removes the veil of mystery of superstition, and develops remarkable facts connected with the characters of material creation, to open a higher order of poetry to the mind ‘than that which, through beauty, sprang merely from the imagination.’”<sup>585</sup> Such passages are rather similar to some in Cicero’s *De natura decorum*, even though the latter was written as an apology for God, not science. Hunt’s apology for science uses language that sounds vehemently as if it is dispelling myth “Where can you find an old wife senseless enough to be afraid of the monsters of the lower world that were once believed in? The years obliterate inventions of the imagination, but confirm the judgments of nature.”<sup>586</sup>

Peacock, in his *Four Ages of Poetry*, which inspired Shelley’s *Defense of Poetry*, writes similar, if sarcastically: “In the origins and perfection of poetry, all the associations of life were composed of poetical materials. With us it is decidedly the reverse. We know too that there are no Druids in Hyde Park nor Niads in the Regent’s Canal. But the poet is

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<sup>582</sup> Charles Dickens, “Review of Robert Hunt’s *The Poetry of Science, or Studies of the Physical Phenomena of Nature*,” *Examiner*, December 9, 1848, 787–88, accessed August 6, 2012, <http://www.ebooksread.com/authors-eng/charles-dickens/the-works-of-charles-dickens-volume-18-ala/page-7-the-works-of-charles-dickens-volume-18-ala.shtml>.

<sup>583</sup> Hunt, *Poetry*, ix.

<sup>584</sup> *Ibid.*, 186-7.

<sup>585</sup> *Ibid.*, 82.

<sup>586</sup> Marcus Tullius Cicero, *De natura decorum* (Cambridge, MA: Harvard University Press, 1967), accessed August 6, 2012, <http://archive.org/details/denaturadeorumac00ciceuoft/2.4-5>.

wallowing in the rubbish of departed ignorance.”<sup>587</sup> Similarly, in Ruskin’s great paean to myth, *The Queen of the Air*, which is about the science in the Athena myths, he ends his preface by writing: “Ah, masters of modern science, give me back my Athena out of your vials, and seals, if it may be done. You have identified the elements, and united them; enslaved them upon the earth.”<sup>588</sup> Perhaps because of his undergraduate degree in the classics, Pupin was eager to maintain connections between the classics and science, as seen explicitly in his essay, “A Message from Science.” We shall return to this later.

For Dickens, as for Hunt,<sup>589</sup> science was not mere “materialism”—electricity is no more material, Dickens wrote, than the journey to visit a loved one on a death bed is material. His support of science often takes the form of sentimental, melodramatic apology. Yet on the other hand, Dickens also mocks science, as he does in *Pickwick Papers*: “‘They appeared in the form of a copious review of a work on Chinese metaphysics, Sir,’ said Pott. ‘Oh,’ observed Mr. Pickwick; ‘from your pen, I hope?’ ‘From the pen of my critic, Sir,’ rejoined Pott, with dignity. ‘An abstruse subject, I should conceive,’ said Mr. Pickwick. ‘Very, Sir,’ responded Pott, looking intensely sage. ‘He CRAMMED for it, to use a technical but expressive term; he read up for the subject, at my desire, in the ‘Encyclopaedia Britannica.’ ‘Indeed!’ said Mr. Pickwick; ‘I was not aware that that valuable work contained any information respecting Chinese metaphysics.’ ‘He read, Sir,’ rejoined Pott, laying his hand on Mr. Pickwick’s knee, and looking round with a smile of intellectual superiority—‘he read for metaphysics under the letter M, and for China under the letter C, and combined his information, Sir!’”

Dickens’s cynical stand towards science is presented in *Pickwick Papers*, *Hard Times*, and *Mudfog Papers*. In *Pickwick* and *Hard Times*, he attacked the British Association; in all three he addresses the root of inhumanity of the first industrial

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<sup>587</sup> Thomas Love Peacock, *The Four Ages of Poetry*, in *The Four Ages of Poetry, Shelley’s Defense of Poetry, Browning’s Essay on Shelley*, ed. H.F. Brett-Smith.

<sup>588</sup> Ruskin, *Queen*, xix.

<sup>589</sup> “The Psychean labours to try man’s soul, and exalt it, are the search for truth beneath the mysteries which surround creation,” Hunt, *Poetry*, x-xi. “Viewing the material world as a metaphysical bundle of essential properties and nothing more – has led some eminent philosophers to struggle with the task of proving that all the wonderful manifestation of the great physical powers of the universe are but modifications of motion, without the evidence of any antecedent force,” *ibid.*, 7-8, etc., such as writing of the “mysteries” of flowers, science leads man up to nature’s God, *ibid.*, 317.



revolution. In a humourous but sarcastic dig at the zeal of scientists who stole a puppy dog for experiments that went terribly wrong, one member of the responsible scientific society remarks at a meeting, “It must be of some consolation to these gentlemen to know that their ardent attachment to scientific pursuits has alone occasioned these unpleasant consequences.”<sup>590</sup> *Hard Times* is perhaps the most bitter of all three, cutting at Stuart Mill’s utilitarianism, and a selfish, over-rationalised society, which could be said to be the product of the extremely rational, scientific mind (after all, this is the kind of premise from which attempts are made to impose scientific ‘laws’ on society – and today the plea continues to be made to leave the humanities to the humanities). This book in many ways foresees the disconnect between drives and speech addressed by Kristeva: one of the characters, Louisa, becomes unable to express herself as a result of her over stringent education, which drives her to depression. Thus where science and its effects are hyperbolized, whether in reality or by the author’s pen, the poetry is lost in the garishness.

### **3.1.6. The fault of science seen by writers, and a labyrinthine aside**

It has already been discussed how the shock of modernity can be seen as a kind of labyrinth that writers either reject or embrace. Pupin, perhaps in the most complex thread of his inter-cultural narrative, sought to reconcile apparent newness, like that of invention, with that which was behind it: eternal forces, like heat, or social structures working together towards “higher endeavours”. To understand his vision requires the metaphorical insight to be able to “read” heat as an eternal force, for example. For those not interpreting or seeking out the human place within the spread of scientific application, the way forward became more labyrinthine than clear, whether such people were blinded by scientific zeal, as seen above, or blocked by ambivalence. This section will attempt to illustrate some of the potential dead-ends to emerge from Pupin’s time, through lack of cultural proficiency, where culture is now also the scientific culture to face, not only be produced by, mankind.

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<sup>590</sup> Charles Dickens, *The Mudfog Papers: Now First Collected* (London: Richard, Bentley and Son, 1880), accessed August 6, 2012, <http://archive.org/stream/mudfogpapersetcn00dickrich#page/n3/mode/2up>, pp. 59-60.

*Pickwick Papers* addresses the amateur scientist and the lack of concern over the relevance of knowledge being sought. An illustration of this is the scene where an old man makes a “theory” on electricity by watching the valet with a lantern.<sup>591</sup> This is the kind of ignorance of the unschooled, unaware of the greater context of knowledge, the *apparatus criticus*.<sup>592</sup> Similarly, Pickwick himself discovers a stone with the inscription, “Bill stumps, his mark” but despite the obvious, the scientific community is convinced it contains vital intelligence from antiquity.<sup>593</sup>

Dickens’ satire partly points to the dangers of the popularization of knowledge for the masses in such large amounts. However, the larger message was that such people ultimately inhibit science and threaten to hoodwink the innocent who cannot understand science. Dickens himself was famously “hoodwinked” into believing spontaneous human combustion, which interestingly consumes one of his characters in *Bleak House*. People were depicted—as they could be depicted today, except there is a dearth of satire to poke fun at such serious pretensions—as trusting anything “scientific”. Dickens critiqued the self-importance and myopia of the zeal of early Victorian amateur scientists and their fervor for chronicling without the depth required for meaning to be constructed. “Obviously, a drop in temperature overnight would not ordinarily warrant publication in many major newspapers, and the publication of such a ‘remarkable’ discovery is representative of the random, inaccurate, or simply irrelevant ‘data’ that many people floated as science.”<sup>594</sup> One of the labyrinthine alleys, then, is ignorance, which increasingly vexes the layperson, surrounded by computer technology and satellites they do not understand. If Pupin’s autobiography reads to some as proselytizing, this may be a misinterpretation of his *déformation professionnelle* as an educator whose many lectures, including those heavily advertised in newspapers beyond the confines of the university, and essays sought to make science intelligible to the general public in a language they would

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<sup>591</sup> William R. Terpening, “Satire and Science.”

<sup>592</sup> This is illustrated beautifully by Eduard Fraenkel, introduction to *Ausgewählte kleine Schriften*, by Friedrich Leo, in *Textual Criticism and Editorial Technique applicable to Greek and Latin Texts*, by M.L. West (Stuttgart: B.G. Teubner, 1973), 7, where he is surprised at being asked which volume (i.e. which translation) he was reading of a playwright. “I looked at the lawn nearby and had a single, overwhelming sensation:  $\nu\upsilon\nu\mu\omicron\iota\ \chi\acute{\alpha}\nu\omicron\iota\ \epsilon\upsilon\theta\epsilon\iota\alpha\ \chi\theta\acute{\omega}\nu$ . Later it seemed to me that in that moment I had understood the meaning of real scholarship.”

<sup>593</sup> Dickens, *Pickwick*, end of chapter 11.

<sup>594</sup> Terpening, “Satire and Science.”

understand. One example of this was how he used the very simple, everyday example of a tree and burning logs as one part of a metaphor illustrating how the machine civilization is a crude copy of terrestrial machines constructed by nature's hand and fed by a gigantic cosmic engine (the tree breaks down sunlight and carbon dioxide into carbon and oxygen, ultimately bringing both food and material for burning).<sup>595</sup> Pupin calls his explanation of (complex) scientific processes the "story of science", which is poetic beyond his metaphor, as seen in his descriptions, such as that of the call of leaves' chlorophyll: "Each leaf is like a suppliant hand imploring heaven for the blessings of its radiation streams."<sup>596</sup> Pupin, as an educator, has sought to make the language of science intelligible to his listeners. Of course, stories were not used by all to present empirical fact; we recall that Hunt was in fact hoping for science to dispel magic from the world.

To Eliot, plain empiricism is like "cheap narration" for being "vulgar" and limited in comparison to the imagination in the construction of "ideally illuminated space".<sup>597</sup> In this context, the critique is of how science is conducted. Science is both a problem and a tool. If we look at *Middlemarch* and continue the conundrums of *Hard Times*, the problem is that science most often leads to blind labyrinthine alleys, not freedom. In this way, Gadamer writes that it is hard for man to find his way in this new scheme of things, in which, as proclaimed by Heidegger, a new metaphysics has emerged, that of "the forgetfulness of being," where all areas of human culture are dominated by technology.<sup>598</sup> What is more, the philosophical texts and the language of art that have been inherited are allowed to speak for themselves, in short, a system becomes systems. In other words, there is not one ariadnic red thread but many alleys. Indeed, this seems to have been foretold by

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<sup>595</sup> Pupin, "Romance of the Machine", 132-3.

<sup>596</sup> Ibid.

<sup>597</sup> Rectenwald, "Construction and Deconstruction."

<sup>598</sup> Gadamer, *Beginning*, 125: "we can recognize how truly radical a thinker Heidegger is when he claims that metaphysics has changed and that it has shifted from being the common horizon of the Western culture to being a new metaphysics, a metaphysics that he designates 'the forgetfulness of being' and describes in terms of the domination of technology in all areas of human culture, and certainly not just in Europe but in the whole world. Heidegger has thus seen many things in a new way that has opened new possibilities of thinking for us as well as the possibility of letting the texts of philosophy that have been handed down—and the language of art—speak for themselves. It is as if a new atmosphere originated with him. Admittedly, finding one's way around in this new atmosphere and following one's own path does not come easily. This is why I like to say that, just as Plato was no Platonist, neither can Heidegger be held responsible for the Heideggerians."

Eliot's scheme, in which *science and philosophy* substitute *faith and order*, especially if we remember that philosophy used to be that order. Order also signifies keeping drives in check: not going to excesses—of chronicling, classifying, etc. To hastily adopt the new scientific approach *sine qua non* has its own blind spots and dead ends. "He can save himself who travels the other road, who ... does not renounce the past which survives in the principle of style and *form*," writes Zolla.<sup>599</sup> This work has so far outlined the style and form when it comes to scientific works to be one that begins with an acceptance of limitations. In the words of Rectenwald, a humanities professor, "Scientific inquiry ... follows from theoretical propositions which are themselves subject to 'constraints of culture' which limit and condition their range and interest. In the grossest sense, themata may be discerned when science is suspected of projecting cultural values onto 'nature' ..."<sup>600</sup>

Whence, then, the imagery of the constrained labyrinth, which, we should not forget, was one of the driving forces behind Arthur Evans' archaeological work. His written legacy almost completely circumvents problems of science—rather, he sought precisely to inscribe on nature the romantic classical notions he had been lulled by since childhood. This influenced his perception of the Adriatic coast when he first visited: from a recess in the mountain he heard "the bellowing of a bull" which "may proceed from some hideous Minotaur, cavered in his labyrinthine den."<sup>601</sup> Oddly, in some ways, such projection onto nature could be seen as an example of the result of the children of the age being exposed to the "false stories" described by Socrates in Plato's *Republic*. The metaphor of the labyrinth emerges through selfishness, deceit, and the resulting punishment, which takes a toll on the innocent: Minos keeping a white bull, his wife deluded into creating progeny with the bull of the sea, the labyrinth constructed to keep the resulting offspring from eating men.

We can find the labyrinth in literary criticism—and even in Baudelaire's *forêt des symboles*, in their being subjective and metaphorical—leading to the ever more abstract languages of abstract art, cubism, fauvism, artistic labyrinths obstructing men from

<sup>599</sup> Zolla, *Eclipse*, 50. Emphasis added.

<sup>600</sup> Rectenwald, "Construction and Deconstruction," fn. 4. Rectenwald, at the time this work is being written teaches both writing and global liberal studies at NYU.

<sup>601</sup> Qtd. in Joseph Alexander MacGillivray, *Minotaur: Sir Arthur Evans and the Archaeology of the Minoan Myth* (New York: Hill and Wang, 2000), 46.

meaningfully coping with the shock of industrialization. In “Correspondances” from which Baudelaire’s line above was taken, it is only the poet that can reveal a new view of nature that he himself invents where he determines the significance of the scents, refining the expressions chosen for this vision, which enable, through sensory equivalents, the transmission of this mystical, personal experience. Similar to this poem is Rimbaud’s “Voyelles” which assigns completely arbitrary colours to letters, lacking logic; here, again, it is only the poet who has the privilege to discern what stands behind appearance. In some ways these poems could be compared to the goals of cubism, with its random viewpoints that the artist has the privilege to assemble. The difference perhaps being that the implications about analysis are greater in this art, as it is analysis that is broken up and then reassembled, in fragments. The reach or ambition of this art became increasingly intense as it exploded beyond the canvas, bringing into the exhibition space things from other contexts, or, as with the case of music, like in the compositions of Edgar Varèse, it became but organized sound and an ‘instrument’ could be a siren (in Ionisation). This latter example perhaps suggests most succinctly how art has increasingly become an imitation of the industrial world around us, sometimes not mediated at all, in the case of Duchamp’s “Fountain” which was just a urinal with a fancy name and change of venue, or if mediated, then subjected to the artist’s sensibilities. How does one read the squares and rectangles on a canvas by Mark Rothko? Gadamer posits that these are the “symbols of the unfamiliarity in which we encounter ourselves and our increasingly unfamiliar world.”<sup>602</sup>

Davenport explains that these new symbols—the refuge of the self in the abstract—are not “properly symbols at all”, in other words, they cannot be interpreted but can only be contemplated “like a transcendentalist brooding on the word *nature*”.<sup>603</sup> It is arguably also traced in the rhizome of Deleuze and Guattari, in those endless passageways of constantly being stuck in between things: the state of being in the labyrinth. Zolla goes further to suggest that the new is a form of regression that is a willed ignorance and therefore destructive: “The absolutely new, the rejection of all roots, offers only a return to a stage prior to the one that has been relinquished, not a leap ahead. The virgin territory is merely that of childhood and backwardness, lived through again in bad faith: to act like a

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<sup>602</sup> Gadamer, *Relevance*, 82.

<sup>603</sup> Davenport, *Geography*, 262.

child does not mean that one returns to being a child; to imitate the primitive does not mean that one recaptures their strength. Just as children slur words, so the avant-gardists exploit African sculpture, children's drawings, Coptic decorations. In literature, disintegration not only of the sentence but of the word itself is attained. If the writer is not blessed by ignorance, he must again assume the attitude of the refractory student, make parodies of culture, play with it as if it were a jumble of disconnected shards and not the word of life. Art must die... only useful objects are worthy of being produced."<sup>604</sup>

This is one way of explaining or describing the change in literary values foreseen by Eliot: the shift from order to the chaos of scientific incipience that becomes increasingly material. Dowdon sees the significance in scientific theories being summarized side by side with fiction: "the cultured imagination is saturated with scientific thought ... the truest pedantry, in an age when the air is saturated with scientific thought, would be to reject it".<sup>605</sup> But we have seen how the Comtean insistence on writing from strict scientific observation can threaten fancy, the mystical—and downplay the imagination. This is arguably the point in Peacock's *Four Ages* where he expresses amused contempt at the claims of science and cant materialism. By contrast, Pupin's science is decidedly not materialistic, given his emphasis on focusing not on what it makes but the forces behind it that make it possible. It is no accident that a great portion of his autobiography is devoted to developing counter-arguments to claims that America (with its scientific industrialization) is too materialistic.<sup>606</sup> Furthermore, his autobiography is testament to the fact that his understanding of science was if not primarily then could also be narrative, drawing on metaphor to become interesting (as seen in his references to stars) and to reach a broader audience. It is where scientific truth loses its connections, which we have seen are so often made possible precisely through the metaphor, that it becomes limiting. While Rimbaud's "Voyelles" is a private metaphorical science of letters, it is a private science, and one that makes no sense.

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<sup>604</sup> Zolla, *Eclipse*, 55.

<sup>605</sup> Qtd. in Patrick Brantlinger, *A Companion to the Victorian Novel*, (MA, Oxford, Victoria Beach, Berlin: Maxwell Publishing, 2002), 121.

<sup>606</sup> Such as where he argues with Bilharz, or counters De Tocqueville's accusations. For example: Pupin, *Immigrant*, 102 and 203-4, 256, 319-320.

Brantlinger writes that the precedence given to scientific truth over the imagination is what led to the later autonomous symbolism of Joyce and Wilde, with the self-referentiality of their narrative worlds and imagination.<sup>607</sup> In other words, faith in the shared rationality of both the human observer and natural phenomenon was the key to the positivist's rejection of theological or metaphysical modes of understanding and opened the door to the relativist solipsism of underground romantic imagination.<sup>608</sup> This was only further pronounced through the science of psychology and its impact on art. "Psychology in the study of dreams defined the symbol as essentially opaque, a confusion rather than an epiphany of meaning. The darker the symbol, the richer it was thought to be, and ambiguity became a virtue in literature."<sup>609</sup> Burke explains it a different way: psychoanalysis is the perspective of incongruity, a hermeticism of merged categories not unlike the realm of the gargoyles.<sup>610</sup> The norms are negativistic, dissociative, dehumanized, destructive, combative, deterministic, selfish.<sup>611</sup>

The cross-fertilization between science and literature led to a middle ground of analogy and allegory being used in scientific writing and the scientific being used in literature; however, this harmonic exchange was increasingly threatened by earlier histories of detachment, self-denial, and rationalism. Popular narrative modes have become superseded by the strange fruit of science. "Folklore has been of service in tracing the spread of motifs; literary history and theory have made fortuitous and largely random tracings of certain routes; Jungian psychology has posited an obscurantist hypothesis of archetypes that can ignore both history and geography."<sup>612</sup> As science becomes more specialized and distinct, literature becomes more obscure, divorcing itself from "the fanatic search for analogies", hence the chaotic, subjective symbolism—the rhizome or labyrinth which, without any real *topos*, can have no beginning or end, as per Deleuze and Guattari. Instead, it becomes a kind of purgatory for those who search in this 'landscape' for the mystical, or unburdened fancy, or the other half of Eliot's dualisms: faith.

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<sup>607</sup> Brantlinger, "Companion to the Victorian Novel," 125.

<sup>608</sup> *Ibid.*, 124.

<sup>609</sup> Davenport, *Geography*, 262.

<sup>610</sup> Burke, *Permanence*, 69.

<sup>611</sup> Ruckert William, *Kenneth Burke and the Drama of Human Relations* (Berkeley and London: University of California Press, 1982), 35.

<sup>612</sup> Davenport, *Geography*, 270.

“The transformation of literature into a secular art form, one which proceeds from consistent methodological principles and which constitutes a distinct professional regime has not been reversed.”<sup>613</sup> Yet even if we were to leave the religious out of this discussion, we still have the problem of *order*. We are left with ambiguous, self-referential symbols – and confusion, which are quite antithetical to what is needed for communication, which is a shared, not private, process. “Poetry is a voice out of nature which must be rendered humanly intelligible so that people can know how to live”.<sup>614</sup> In this respect, Pupin can be described as one of the last bastions of poetry in scientific writing. One has only to read one of his commencement speeches to see examples of both poetry and very specific advice on how to live the good life. “The development of character is the highest aim of a college education, it is the most precious achievement of the art of making life worth living. It is the most sublime product of God’s creation,” he said at one school.<sup>615</sup> “Thanks to early training at Columbia, I feel the longer I live, the more attractive life seems to become.”<sup>616</sup> These words echo Cicero’s famous line, *haec studia adolescentiam alunt, senectutem oblectant*, “studies sustain youth and entertain old age”, revived by Petrarch at the birth of the Renaissance humanities. It is regrettable that in our age the humanities are relegated to ever shrinking departments. Davenport regrets how art has in fact regressed where it looked most progressive, and this despite the warnings of those writers who were perhaps the last to know Ciceronian passages, for example, by heart: “Men have walked on the moon, stirring dust that had not moved since millennia before the archaic hand carved images on the Sarlat bone which mean nothing to our eyes. The world that drove Ruskin and Pound mad has worsened in precisely the ways they said it would. Eliot’s wasteland has extended its borders; Rilke’s freakshow outside which the barker invites us to come in and see the genitals of money is a feature of every street. Never has an age had more accurate prophets in its writers and painters... We are just now seeing, amidst the fads and distractions, the strange fact that what has been most modern in our time was what was most archaic [i.e. in the ‘fanatic search for analogies’], and that the impulse to recover beginnings and primal

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<sup>613</sup> Brantlinger, “Companion to the Victorian Novel,” 131.

<sup>614</sup> Davenport, *Geography*, 28.

<sup>615</sup> Pupin, “Hotchkins School” (speech delivered in Pakeville, CT, June 15, 1929), C.U. Rare Books, M.S. 1035.

<sup>616</sup> Pupin, “Class Letter” (speech delivered at 50<sup>th</sup> Anniversary, March 26, 1939), C.U. Rare Books, M.S. 1035.



energies grew out of a feeling that man in his alienation was drifting tragically away from what he had first made as poetry and design as an understanding of the world.”<sup>617</sup>

We could digress to consider the modern obsession with ‘ages’ in Peacock’s *Four Ages*, to Vico’s ages that inspired Marx, and so different from the moral tone in Hesiod’s ages in *Works and Days*. But though we are technically in an age different from that of the Victorians, in some ways, it seems that the age remains the same, illustrated by the many ‘prophets’ whose visions of the future do match our experience today. Tennyson wrote that as science grows, beauty dwindles; Lawrence, that knowledge has killed the sun, making it a ball of gas, with spots; Keats, that science would unweave a rainbow; Verlaine, that science is like the forbidden fruit; Wordsworth, that a scientist would peep and botanise upon his mother’s grave (though his stand shifts in different texts and poems).

There was arguably more of a balance between poetry and science in Victorian times than there is today as novelists and poets were making a conscious effort to reconcile the optimistic vision of scientific naturalism with their own affirmation of human will and imagination.<sup>618</sup> The sublimation of self underneath the fiercely individual as refuge from rationalism has become a problem. It may be posited that the degenerate primitivism Davenport lamented was an extreme reaction to an increased emphasis on rationalism.

Along these lines, Burke considers the fiercely individual reactions in art to be caused by the purely utilitarian philosophy of action that forces the modern poet, in anguish, to commit “symbolic outrages”, outrages which, in the past, would have been cancelled out by proprietary (shared) rituals. An increase on technology, as well as philosophical and moral/intellectual psychoses, has not enabled man to lead an outwardly better life, but has left him in need of a poetic cure. Man’s access to the symbol and his desire to reach it is killed by the preponderance of the rational (and obscurist hypotheses) at the expense of the emotional (and shared symbolic horizons).

The modern—as scientised nature—is a labyrinth because not all corridors lead to the exit. It would be impossible to deny it and its effects, so it seems one should make the

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<sup>617</sup> Davenport, *Geography*, 28.

<sup>618</sup> Brantlinger, “Companion to the Victorian Novel,” 125.

best of it in the hopes of getting through it. The best of science, for Dickens, were the metaphors it offered him with which to describe human reality.<sup>619</sup> Coleridge saw poetry and science as complimentary in the epic poems he wrote to contain all knowledge. This is a sign of optimism. When working with him, Wordsworth takes a different view on science, writing in their joint work, “The poet ... will be ready to follow the steps of the man of science”.<sup>620</sup> He also wrote a poem called “Steamboats, Viaducts, and Railways”,<sup>621</sup> that praises science while acknowledges its faults, which incidentally echoes Pupin’s own reservations that were also poetic in their expression. An example of this is where Pupin writes of the need for a moving power of infinitely minute electrons in man’s heart to move him to see the moving power behind heat and electricity if he is to fully and properly evolve from them.<sup>622</sup> Pupin’s reference to heat is what powers the vehicles in the title of Wordsworth’s poem and Pupin’s reference to moving powers beyond man are mentioned in Wordsworth’s poem: “Motions and Means, on land and sea at war / With old poetic feeling, not for this, / Shall ye, by Poets even, be judged amiss! / Nor shall your presence, howsoever it mar / The loveliness of Nature, prove a bar / To the Mind's gaining that prophetic sense / Of future change, that point of vision, whence / May be discovered what in soul ye are. / In spite of all that beauty may disown / In your harsh features, Nature doth embrace / Her lawful offspring in Man's art; and Time, / Pleased with your triumphs o’er his brother Space, / Accepts from your bold hands the proffered crown / Of hope, and smiles on you with cheer sublime.”<sup>623</sup>

Wordsworth writes that the poet would aid science once it becomes more humanized: “If the time should ever come when what is now called Science, thus familiarized to men, shall be ready to put on, as it were, a form of flesh, blood, the Poet will lend his divine spirit to aid the transfiguration, and will welcome that being thus produced,

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<sup>619</sup> Winyard and Furneaux, “Dickens, Science.”

<sup>620</sup> William Wordsworth, and Samuel Taylor Coleridge, preface to *Lyrical Ballads* (1802), accessed August 6, 2012, <http://www.english.upenn.edu/~mgamer/Etexts/lbprose.html>.

<sup>621</sup> William Wordsworth, “Steamboats, Viaducts, and Railways,” in *Composed or Suggested during a Tour in the Summer of 1833*, XLII, accessed August 6, 2012, <http://www.gutenberg.org/files/10219/10219-h/10219-h.htm>.

<sup>622</sup> Pupin, “Fritz”.

<sup>623</sup> Wordsworth and Coleridge, *Composed or Suggested*.

as a clear and genuine inmate of the household of man.”<sup>624</sup> Here, as in Wordsworth’s “Steamboats”, we find the Romantic approach to technology, which we also find in Pupin and the mimetic principle of *techne* insofar as it is benevolent and follows the creation of the stars, which was explored earlier in this work in the discussion of the stellar metaphor.<sup>625</sup> The way out of the labyrinth is to see it from the right perspective: the politically blind alleys in the labyrinth with the charging Minotaur can become a nourishing honeycomb depending on where the symbols are set and whether they serve a greater whole, like the honeycomb made by bees—whose work promotes the growth of flowers, or whether they are internal, narrow and self-absorbed, like the labyrinth.

### 3.1.7. Poetic prophets on changing scientific views

Erasmus Darwin has already been mentioned here as a forerunner of the changing scientific thought, who introduced the change of ideas through the guise of poetry, through allegory. His work is presented here as a precedent to Pupin’s autobiography and, as already outlined, while representative of a work with philosophical ideals behind it, these ideals were contrary to Pupin’s and more characteristic of the present age. His poem *Botanic Garden* heavily influenced by Brooke’s *Universal Beauty*, contains a prophetic verse, though ultimately representative of the poem’s transparent purpose to forward Lucretian, atomistic views: “Star after star from Heaven’s high arch shall rush, / Suns sink on suns, and systems crush, / Headlong, extinct, to one dark center fall / And Death and Night and Chaos mingle all: / Till o’er the wreck, emerging from the storm, / Immortal Nature lifts her changeful form, / Mounts from her funeral pyre in wings of flame, / And soars and shines, another and the same.”<sup>626</sup>

We see here Aeneas’ journey to the underworld, and the initiation into reincarnation. But what is most striking about this verse is how closely related it is to

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<sup>624</sup> Wordsworth and Coleridge, *Lyrical*.

<sup>625</sup> Pupin, *Immigrant*. See pps. 35, 75, 128-30, 168.

<sup>626</sup> Darwin, *The Botanic Garden*.

Yeats' "Second Coming", published in the American periodical *The Dial* in 1920, and which was written after the very concrete experience of WWI, at the beginning of the Irish War of Independence: "Turning and turning in the widening gyre / The falcon cannot hear the falconer; / Things fall apart; the centre cannot hold; / Mere anarchy is loosed upon the world, / The blood-dimmed tide is loosed and everywhere / The ceremony of innocences drowned; / The best lack all conviction, while the worst / Are full of passionate intensity."<sup>627</sup>

Chaotic images have been let loose upon the world: a nightmare of disorder and a loss of values. There is a shift in how nature is perceived: is it Eleusian or are we to strive for order? The answer in Victorian times was affirmative of the latter: the answer of modern art is affirmative of the former. Yeats' poem preceded the appearance of Pupin's autobiography which explicitly puts forward a trinity of ideals that are to coherently work together; it may therefore be inferred that Pupin was fulfilling a private role in attempting to put coherent, not chaotic, forces into place. As to this chaos, it was named directly and much earlier, in these more modern times, in Pope's *Dunciad*: "See *Mystery* to *Mathematics* fly! / In vain! They gaze, turn giddy, rave, and die. / *Religion* blushing veils has sacred fires, / And unawares *Morality* expires. / Nor public flame, nor private, dares to shine; / Nor human spark is left, nor glimpse divine! / Lo! Thy dread empire, Chaos is restored."<sup>628</sup>

The verse, as we may have anticipated, is the antithesis to Pupin's views. His science does not preclude mystery, which is encapsulated in the poetic motif of stars hearing and singing messages, which demonstrate the overall idea that the scientist can at best become attuned to parts of these eternal messages, though even those messages connected to heat and light are not "the most important question".<sup>629</sup> Which is the perfect segue to the mention of "religion" in Pope's verse, personified as blushing and hiding the sacred in the face of mathematics. Pupin's science was not at odds with religion, in fact, his metaphors of the stars as well as the motif of scientists being saints that run throughout the

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<sup>627</sup> William Butler Yeats, "The Second Coming," in *Michael Robartes and the Dancer*, accessed September 5, 2011, <http://gutenberg.net.au/ebooks06/0608531.txt>.

<sup>628</sup> Pope, *Dunciad*, Book IV.

<sup>629</sup> Pupin, *Immigrant*, 166.

autobiography prove as much. What is more, his pursuit of science in such a way bore the approval of his illiterate but pious mother. As such, morality does not “expire” in Pupin as it does in Pope’s verse: Pupin lauds morality as one of the features of the guiding *star* of the American Revolution (this is another of his stellar references).<sup>630</sup> Pupin’s enthusiasm for science was thus in check—by morality, bigger questions, in short, religion—despite his dedicated belief in the importance of science. Davenport calls the Victorian writers who warn of the dangers of unchecked scientific extremes, “prophets”. Taking Dickens’s objections against science where it trespasses fancy, Pope writes: “In vain, in vain, --- the all-composing hour / Resistless falls: the Muse obeys the power. / She comes! She comes! The sable throne behold / Of *Night* primeval, and of *Chaos* old! / Before her, Fancy’s gilded clouds decay, / And all its varying rainbows die away. ... / *Art* after *Art* goes out, and all is night.”<sup>631</sup>

The verse claims in part that art cannot be sustained by chaos; indeed in Pupin’s autobiography, he considers of primary importance the coordination of the chaotic, wherein terrestrial organisms have instrumentalities to bring order out of disorder and cosmos out of chaos, which is a fundamental guiding principal of their life, and leads to beauty.<sup>632</sup> Pupin subsumes science to art, writing that one of the ideals in science is that it cultivate the beautiful like any other fine art.<sup>633</sup> As such, Pupin’s views were contrary to those foreseen in Pope’s verse.

But two hundred years later, Zolla, quoting the Russian Constructivists, writes that art must die.<sup>634</sup> Slightly preceding this was the emergence of the experimental novel, which may be considered as a science unto itself, of the narrow kind, as we shall try to explain again in a moment. We have mentioned in passing the autonomous symbolism that was characteristic of Joyce’s prose: this may be taken as a trait of experimental literature, which is not without its precedents as the Pope verse implies (while Laurence Sterne is often considered the earliest writer of such literature, an argument could be made that the same could be said of Rabelais, or some Menippean satire, or that it is as similar to Lucian of

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<sup>630</sup> Pupin, *Immigrant*, 315.

<sup>631</sup> Pope, *Dunciad*, Book IV.

<sup>632</sup> Pupin, *Immigrant*, 385.

<sup>633</sup> *Ibid.*, 382.

<sup>634</sup> Zolla, 55.

Samosata's works as modern art is to familiar symbolism). Being explicitly experimental, it is difficult to generalize all that is classified in this genre; also, its name implies both successes and failures. Overall, however, the science of this art could be generalised as either the destruction of meaning, like in F. T. Marinetti's so-called novel, *Zang Tum Tum*, or a rejection of form, or both. But even the rejection of form has its precedents, for example, in the creative essays by Chinese scholar-officials in their leisure, like those of 11<sup>th</sup> century Ou-yang His, so it is not enough to define the genre in this way. Perhaps most summarily, we might say that this scientific experiment is primarily one of whim looking to break with limits while limits are placed on the humanities from a scientised society or looking to internalize scientism by allowing science (not tradition) to dictate form. In this way, if art is made by man for man as an attempt to share something about experience in a shared 'language', art may indeed be said to be dead, as it is too fragmentary to be fluent.

The art produced since that period is, generally speaking, less beautiful than it is provocative; less meaningful than unusual and fascinating, like William S. Burroughs' cut-ups. The cure to this philistinism is in "the varying rainbows" mentioned in Pope's verse. In Victorian times, and unlike today, there was still a healthy debate being waged between letters and science, which analysis of Eliot's and Dickens' role above has hopefully made explicit. Such debate was more dynamic than an art of transgression or scientism that either seeks to efface the author or is intensely subjective, as we saw in "Voyelles." By contrast, Pupin's subjectivism, while invariably present in an autobiography, ultimately seeks, even from within its genre devoted to self, to serve some sort of higher, universal good. In this sense, literature is to be used for the purpose of coherent sharing, for confirmation of what is shared, and not as private discourse. The "prophets" are those who foresee new trends encroaching literature, limiting its reach and relevance, essentially converging disparate fields instead of expanding: "See *Mystery* to *Mathematics* fly!" It is important to reiterate when quoting Pope's verse that while he criticized "insane" mathematics, he had nothing against science per se (chained beneath a footstool) but against sophism and flattery, and ultimately the destruction of classical values of the kind outlined in the first part of this chapter.

One cannot speak of such prophets without mentioning Ruskin, who like Pupin was modern in so many ways, yet upholds the bastion of classical values. His work *Queen* is of particular significance here for several reasons. According to the preface, as he was writing it, he had consulted Tyndall's "January 16 paper" (possibly the same as Lecture IV available in print, though delivered in America, but sharing themes found in "The Blue of the Sky").<sup>635</sup> Ruskin criticizes the attempt to "form within an experimental tube, a bit more perfect sky than the sky itself!", criticizes the pollution ruining the Alps, and concludes, as we have already seen: "Masters of modern science, give me back my Athena out of your vials." This seems a direct response to another of Tyndall's articles: "The Rainbow and its Congeners", where he ends by writing that he had succeeded in "rendering the 'Glory of Buddha' [an optical illusion] a captive of the laboratory. The result might be taken as typical of larger things."<sup>636</sup>

*Queen* seems, in many ways, to be a complex rebuke to Tyndall's logic—more will be said of this pair later—but the essence of the book is implied by clarification within it of another of his books, *The Ethics of the Dust*: "spirit is continually creating its own shell of definite shape out of the wreck around it", which speaks to how we should interpret natural phenomena. The book illustrates the symbolic 'text' of life and how it ought to be read through the classical value of virtue: all guidance to the right sense of the human and variable myths will probably depend on our first getting at the sense of the natural and invariable ones. Though a paean to Athena, the book also explores the morality of economy, the ethics of art ("if it has too much ornament ... its carver was greedy"), modesty, discipline, and so on. In other words, while describing air, dust, clouds, and so on, as they 'work' through science and as they 'appear' in myth, he also considers their meaning to the quality of human life. This is quite a contrast to Tyndall's essay on the rainbow in which he writes: "There is a certain form of emotion called intellectual pleasure which may be excited by poetry, literature, nature, or art, but I doubt whether among the pleasures of the intellect there is any more pure and concentrated than that experienced by

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<sup>635</sup> John Tyndall, "Lecture IV," in *Six Lectures on Light* (London: Longman's and Co., 1906), accessed August 6, 2012, <http://www.gutenberg.org/files/14000/14000-h/14000-h.htm>. This addresses the themes from the paper Ruskin cites in his introduction.

<sup>636</sup> Tyndall, *New Fragments*, 223.

the scientific man.”<sup>637</sup> Pupin, like Ruskin, saw science as but one part of the human experience: Pupin’s three higher endeavors were intellectual (i.e. study), aesthetic, and spiritual. They are the ideals that form the ultimate message of his autobiography,<sup>638</sup> and it is they that work in coordination to restore order to primordial chaos.<sup>639</sup> Pupin’s wish for order is explicit and contains a practical outline of the work to be done for its realisation. This work is not entirely scientific: the intellectual is matched not by one but two other “varying rainbows”. His writing shows that he took equal pleasure in all three, and in fact when describing each in his final pages, they all factor into each other, such as his description of beauty which includes a description of the spiritual “terminals” in the stars and in man’s mind, or his point that the National Research Council, representative of the intellectual ideal, would bring man closer to God than divinity through the discovery of the immutable laws of the universe.<sup>640</sup> Man, contemplating what is behind nature to “lift the veil of this impenetrable background” and reveal the “throne of a divine power”,<sup>641</sup> is to access mysteries and divine truths. As such, the church’s beautiful tin star is the highest figurative point to be reached by the intellectual pursuit of science, and in this way, even his ideals are coordinated.

Like Pupin and Tyndall, who both gave university and public lectures, Ruskin, believed in the importance of education, teaching at one of the night schools for workers, though much less of a diplomat than Pupin and more of a rhapsodic prophet like Pope, as demonstrated in his anaphora: “Modern science is not *savoir vivre*, but *savoir mourir*.” (Tyndall lectured to men of all walks of life in order so that “gentlemen are not confined to any class”.)<sup>642</sup> Ruskin is not only important in this discussion for being one of the first journalists to introduce complex topics in simple language, but also because he wrote

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<sup>637</sup> Tyndall, *New Fragments*, 202.

<sup>638</sup> Pupin, *Immigrant*, 377-87. The final pages of his autobiography close with his explaining what each of these ideals means and how to realize them: i.e., the spiritual in the faith in the good and zeal for truth to be promoted in science; the beauty of electrons in light; the intellectual support of the National Research Council.

<sup>639</sup> *Ibid.*, 384.

<sup>640</sup> What is more, for Pupin, science is art (*Ibid.*, 178, 179, 183, 264, 273, 280, 285, 289, 295, 303, 304, 333, 338, 339, 341, 342, 357, 358, 362, 363, 364, 365, 367, 373) and while he also describes science as beautiful (303, 330, 354, 357) he also sees beauty particularly in nature (*Ibid.*, 53, 146, 147, 332) but also poetic language (*Ibid.*, 179, 189).

<sup>641</sup> *Ibid.*, 383.

<sup>642</sup> Tyndall, “Matter and Force,” in *New Fragments*, Vol. I and II.



volumes on the meaning and impact of changes in production, science, and technology. He does not necessarily chastise science, but warns that the scientist is likely to go astray in his own work for lacking the practical skills to delineate natural appearances accurately. In one of his essays, he quotes Pope's *Essay on Man*: "Why has not man a microscopic eye? For this plain reason, man is not a fly".<sup>643</sup>

Scientists were seeking to increase their powers by artificial means, such as by employing instruments allowing them to see things otherwise invisible to the naked eye, and this created a rift between the artist and the scientist. He was anxious about the fearful misuse to which the results of science were put, and thought it unjustifiable to pursue scientific knowledge without a clear idea of the human ends it was to serve. "The practical fact which will remain for the contemplation of the future is that we have lost the art of painting on glass, and invented gun-cotton and nitro-glycerin." He wrote, for instance, that had the industrial smog existed when Turner painted, the latter would never have been able to create the masterpieces he did. By the end of his life, Ruskin had become disillusioned by science, and in his writings, a rift emerges between letters and science.<sup>644</sup>

Where Ruskin was cynical, Pupin was idealistic, exclaiming at the end of his autobiography written towards the end of his life, "Oh, ... what new beauties are disclosed by science in the meaning of the words in Genesis",<sup>645</sup> and lauding the "supermind" and the "superman", beliefs in which, Pupin believes, is justified "in the history of the evolutionary progress".<sup>646</sup> It is here where he embarks on his theory of coordination, which he proposes man be led by in an ideal democracy, which would make of him not just any man but a superman.<sup>647</sup> In his hope for his ideal, he cites evolutionism and draws on the young promise of America. It may be conjectured that his optimism stems precisely from the

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<sup>643</sup> Edward Alexander, "Ruskin and Science," in *The Modern Language Review* 64, no. 3 (July 1969): 508-21, accessed August 6, 2012, <http://www.jstor/stable/3722043>. Also viz. the hubris in Mary Shelley's *Frankenstein*.

<sup>644</sup> All of this paragraph, *ibid*.

<sup>645</sup> Pupin, *Immigrant*, 382.

<sup>646</sup> *Ibid.*, 384.

<sup>647</sup> *Ibid.*, 387: "There certainly is something in the evolutionary progress of the world which favors the view that the coordinating instrumentalities which guide the activities of every organism, and which are very powerful in man, may enable us some day to find a way of coordinating the non-coordinated activities of the many millions of individuals of a great community like these United States, and thus of creating an ideal democracy. I see in the organization of the National Research Council the first step in that direction."

promises of the new world, as opposed to the less excitable rationalism of Ruskin in the old world; as more will be written about culture in later chapters, suffice it to say now that Ruskin may have been the better prophet as science has eclipsed art. This imbalance is hinted at in Pupin's scientifically-inspired description of the superman living in an ideal democracy, although just a few pages earlier, he wrote in flowery language of his religious experience of looking at the stars he understands through science—which he calls problematic not for the sentiment but because not everyone possesses enough knowledge of science to understand him.<sup>648</sup> In this respect, the flowers of his language are cut by ignorance more than mere science, yet despite this ignorance he strives for ideals.

The great scientist Maxwell, himself, also warned of the rift between letters and science in his “Telephone” speech. He laments, as will be seen in more detail, that most scholars think they assemble around universities merely for the amenities they offer and the opportunity they afford scholars to study what they like. He says this is not unlike the supposition that bees visit flowers for honey. However, he says, the real motive of the bee's activity is to spread pollen in order to allow ever more flowers to grow, to create ever greater business among bees in the future. His point was that there needs to be cross-fertilization of study, and through literary references, implies that if this does not happen, we will share the fate of Tennyson's *Idylls of the King*. This warning is not unlike the moral warning in Bacon's *The New Atlantis*.

### 3.1.8. Conclusion

The cross-fertilization in Victorian times afforded dynamic dialogue between letters and science to the extent that while arguments were presented as to the preponderance of one over the other, there was still a middle ground, occupied at once by writers like Darwin,

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<sup>648</sup> Pupin, *Immigrant*, 382: “The light of the stars is a part of the life-giving breath of God. I never look now upon the starlit vault of the heaven without feeling this divine breath and its quickening action upon my soul. But here I must stop. I feel the heavy hand of the fundamentalist pulling me down, and the icy chill of his disapproving voice reminds me that his theology will not permit an interpretation of the words of Genesis which cannot be understood by people whose knowledge of science is about the same as that of the Assyrians and Chaldeans of several thousand years ago.”

who was optimistic about and creative about introducing scientific dialogue to the everyday, and writers like Ruskin, who advised scientists to possess *sophia* in order to steer aright amid the temptations of false or extraneous inquiry. Scientists like Tyndall, through his popular lectures and educational funding, forwarded the scientific cause over letters, yet even Tyndall, named “the poet of science” with the gift to “give us the poetry of science without impairing the quality of science itself”, valued the use of literary technique in explaining science. Tyndall was recognized by Pupin as such, and it has been argued that Tyndall developed his literary skills through his admiration of Emerson.<sup>649</sup> Here, it ought to be noted that the “poetic” quality of Tyndall’s writing is such that it can entertain the imagination of the layperson in order to educate that imagination in science (which is no small feat). Emerson, on the other hand, did use scientific results by way of comparison, but seems not to have understood them.<sup>650</sup>

While the shift in dynamics from a balance between elements to a tendency towards the exclusively and ostensibly rational scientific had not yet taken place, certain writers were prophets of what was to come. An illustration of this is the volume of essays edited by Elizabeth Peabody—one of Frobel’s students, who introduced building blocks and activities like singing, dancing, and gardening to kindergarten classes (education is one of the building blocks of this period, as already stated). In the volume, Peabody assembled many thinkers of the age: Palmer, Emerson, Hawthorne, Thoreau, etc. As the volume was published in 1849, it is more representative of the old guard: citizens thinking for and governing themselves; relying on their own labour; using classical values to improve the quality of life. Already in this volume, “aesthetics” is being defended as if under fire. Aesthetics is “more than” the dictionary definition, but like Carbon Dioxide or Oxygen it is “an element that encounters man’s inquiry in the most unexpected forms...aesthetic elements are an indivisible part of all human creations which are not merely works of necessity: based on idea, not appetite.” Similarly, the essay on criticism warns of things being “criticized out of existence”. “The destructive criticism of the old social state was not based on experience or criticism but on ‘exact science’”. The comparisons in the essay on

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<sup>649</sup> He wrote that, “My science owes a great deal to Emerson, Fichte and Carlyle, three men who care little for science,” qtd. in Raychel Haugrud, “Tyndall’s Interest in Emerson,” in *American Literature* 41, no. 4 (January 1970): 516, accessed August 6, 2012, <http://www.jstor.org/stable/2924199>.

<sup>650</sup> Haugrud, “Tyndall’s Interest.”

aesthetics between aesthetics and elements are comparable to Eliot's attempt to include scientific discourse in a larger discussion of human experience that nonetheless reach beyond science. Where the essay makes mention of creation, Eliot describes the presence of the mystical.

It was during this time that art and science became divided, most visibly in the demarcations between fields of study. Such a literal separation of course of study had an impact on the analogical, symbolic horizon (which is the domain of *Letters*). Pupin himself was an advocate of the shared horizon: to the end of his life, where he did not validate the importance of an education in the humanities, he drew heavily on its references, like the commencement speech where he quotes Tennyson and speaks of how science has realized the intuitions of the ancient Greeks through revealing the scientific principles behind Homer's wandering Ulysses.<sup>651</sup> Most illustratively, he wrote in a class letter, "Thanks to early training at Columbia [in the classics], I feel that the longer I live, the more attractive life seems to become."<sup>652</sup> So where Pupin promotes a creative coordination involving three higher endeavors: the intellectual, spiritual, and aesthetic, Burke argues that the separation of church and state led to fragmentation: into politics, art, science, and business. Under the resulting stresses, the emotional category is ignored. Ruskin explained that the teaching of art is the teaching of all things: the emphasis on connection, connectiveness. Separation, to his mind, was synonymous with deathfulness: there must be associations between different kinds of understanding.

In Victorian times politics and economics began to separate, becoming isolated, individual: reflected in the changing economy which so distressed Arnold, the father of the Arts and Crafts movement, and Ruskin, both of whom sought to educate the labour class and both of whom were concerned by poverty caused by a lack of ethics. Ruskin writes of the madness of economists who seek land on the other side of the river instead of life—of the honest souls around them.<sup>653</sup> Arnold writes of the "eternal seducers": worldly splendor, security, power, pleasure—the exterior goods, and how it is "all too natural" that one

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<sup>651</sup> Pupin, "Commencement Speech, Rochester": "Homer's epic of wandering Ulysses would sound like a commonplace tale in comparison as the story of the blessed toil of the wandering drops of the heavenly clouds."

<sup>652</sup> Pupin, "Class Letter: 50<sup>th</sup> Anniversary".

<sup>653</sup> Ruskin, *Queen*, 121.

pursues them, although they keep mankind from perfection.<sup>654</sup> In this vein, Tagore writes about how ideals have been crushed by a science motivated by immoderate profit: “But in recent centuries a devastating change has come over our mentality with regard to the acquisition of money ... it becomes an outrage ... by bribing us, tampering with our moral pride, recruiting the best strength of society in a traitor’s campaign against human ideals ... Such a state of things has come to pass because, *with the help of science*, the possibility of profit have become immoderate.”<sup>655</sup>

Such complex concerns are also addressed by Shelley in *A Defence of Poetry* who writes that poetry is crushed by the immoderate accumulation of scientific knowledge: “We have more science and economical knowledge than can be accommodated to the just distribution of the produce which it multiplies. The poetry in these systems of thought is concealed by the accumulation of facts and calculating processes ... The cultivation of those sciences which have enlarged the limits of the empire of man over the external world, has, for want of poetic faculty, proportionally circumscribed those of the internal world; and man, having enslaved the elements, remains himself a slave.”<sup>656</sup>

It is well to remember William Cobbett, who was remembered in more recent times by the eponymous work by G.K. Chesterton. He propagated the evils of paper money and wrote of the ills of the subdivision of labour through industrialism and so on. Of course, it is indicative that Cobbett is most well known today for the literary prowess he demonstrated in his work *Rural Rides*. But at the time, the divisions were just being established, and there was still a discernable shared symbolic horizon. It would take the 21<sup>st</sup> century to shatter that ceiling—or, as Burke writes, lead to symbolic parricide, whereby the noble symbol of shelter comes crashing to the earth.<sup>657</sup> With the Communist manifesto came the prototype of cries of rage, with the avant-garde, the fragmentary, dislocated, and destruction of the impulse to unify, while psychoanalysis led to obscurist hypotheses. Yet in 1863, Jules Verne was already writing of the jargon of science supplanting poetry.

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<sup>654</sup> Arnold, *Culture*, 63.

<sup>655</sup> Rabindranath Tagore, *Creative Unity* (London: The MacMillan and Co. Ltd., 1922), accessed August 6, 2012, <http://www.gutenberg.org/files/23136/23136-h/23136-h.htm>, pp. 115-6. Emphasis added.

<sup>656</sup> Percy Bysshe Shelley, *A Defence of Poetry*, in *The Four Ages of Poetry, Shelley’s Defence of Poetry, Browning’s Essay on Shelley*, ed. H.F. Brett-Smith, 52.

<sup>657</sup> Burke, *Permanence*, 71.

Until the end of his life, Pupin, through his action and speech, effectively buttressed the bastion of rich, universalistic linguistic formulation. There are no class divides in his speech, because he belonged to both the ‘lower’ and ‘upper’ classes., a characteristic of Victorian figures who either rose through the ranks like Tyndall, or engaged with classes not their own, like Ruskin and Arnold and other educators, as we have seen, as well as William Morris who is perhaps most known for engaging with the working classes. It is worthy of note that in England and Wales, the Reform Acts of 1832, 1867, and 1884 effectively allowed the middle class to share power with the upper classes, and the 1867 Reform Act empowered those even lower down on the social scale. Across the Atlantic, we saw in the press on Pupin’s life reviewed in earlier chapters that the America of that time was less concerned with class as it was with ability, and therefore the joining of “immigrant” with “inventor” in the title of his autobiography was also a sign of the times. There are no rifts between science and letters either, because he united them also like the polymaths of his age. We have explored the combination of these themes in literature (e.g., Eliot, Dickens) and in science (e.g., the scientific poems of Maxwell or the literary metaphors even in Hunt’s book about the victory of science over poetry). Of course, the very existence of so many polymaths at that time implies cross-disciplinary proficiency. There is no fracture in Pupin’s cognitive map, because his was a universe first compatible with the single one conceived in antiquity, which we may illustrate here as his reference to the creative coordination observed by the ancient Greeks that derived an ordered cosmos from chaos;<sup>658</sup> we have seen how this universe was conveyed through discourse.

Language plays a central role in describing and directing man towards his place in the universe. Randall, in “Galileo’s Methodology Derived from Aristotle’s Teaching at Padua” writes that it is precisely linguistic formulations that enable us to formulate further questions (it is good to remember that Galileo—as Newton, for example—furthered his academic ideas through discourse with fellow scientists). He writes that a subject matter is not intelligible until it has been articulated, and that knowing, and linguistic formulation, is the power to do something: “When pushed to its final limit, ‘knowing’ is ultimately the power to know how to live well.” It is for these reasons that we might want to be concerned

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<sup>658</sup> Pupin, *Immigrant*, 384.

that since Pupin's time, a divide has emerged between *Letters* and science. In this chapter, we have reviewed the experiments made in art, which in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries became more subjective, random, and ostensibly scientific. Pupin does not address these changes but instead writes of his idealism, which he believed would continue to improve man's aesthetics, spirituality, and science, providing that man is in tune with the divine and moral. More will be said about morals later, for now, suffice it to say that Pupin ended his autobiography with his wish that man become the superman of ideal democracy, which is possible, he wrote, because evolution does exist. Where writers like Ruskin and Arnold saw the arts threatened through the democracy that came with the Reform Acts,<sup>659</sup> Pupin rallied behind democracy where such meant the cultivation and coordination also of the aesthetic, considering that subscribing to views that the world was chaotic was a form of pessimism.<sup>660</sup> In this way, then, it is possible that Pupin would describe the divide that has emerged between *Lettres* and science as an expression of pessimism.

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<sup>659</sup> It is noted that Arnold's *Culture and Anarchy* and Ruskin's *Crown of Wild Olive* addressed how an increased electorate might threaten high culture.

<sup>660</sup> Pupin, *Immigrant*, 384: "There are many pessimists to-day who prophesy the opposite course of development of this [order, creative coordination], in their opinion, most wicked world. Modern science confirms [there is coordination and order, and that beauty evolved out of disorder] in a remarkable manner."

#### 4. 19<sup>th</sup> Century Views and Classical Counterpoints

We have seen that even in literature, or through literature, the cross-fertilization of thought was beginning to be parceled off. We have also seen how closely tied philosophical views (by this, we are including Lucretius and atomism, for example) were to this larger field, as were religious views. It is for this reason that it becomes necessary to further explore some of the trends in thought in late Victorian times, as was defined earlier,<sup>661</sup> and with such a background in better perspective, to have a clearer picture of Pupin, and where his thought fits in to this bigger picture.

Jerome Bruner in *The Autobiographical Process* writes that a good autobiography is communicable through its representativeness: “Late nineteenth-century scholars made much of ‘representativeness.’ An autobiography must be ‘representative’ of its times, however unusual or special it might be.”<sup>662</sup> In this respect, then, we are justified in examining the leitmotifs of the “zeitgeist” in Pupin’s autobiography: the claims against science being materialistic<sup>663</sup> and the ideals of science, which include classical values such as diligence and labour; those aspects of the zeitgeist embodied by Tyndall, an important figure in the book; and Pupin’s classical education first introduced to him through former theological candidate, Bilharz.

The claims of science being materialistic are first made in Pupin’s autobiography by Bilharz, who praises Greek writers, plays, articulation, and orators, and uses them as a counterpoint to American materialism. Pupin demonstrates his early attempts at using Bilharz’s arguments in defense of America in conversation with him: “According to him [Bilharz] the first had its seat among the gods on the ethereal top of Mount Olympus and

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<sup>661</sup> The term ‘Victorian’ is used here to refer to not only that period in history (the early 19th to the early 20th century) but as shorthand for the myriad polymaths with a classical education to emerge not only as professionals in various fields such as science or politics but also as writers, interestingly also with a strong interest in, for lack of a more connotative English word, *civitas*.

<sup>662</sup> Bruner Jerome, “The Autobiographical Process,” in *The Culture of Autobiography: Constructions of Self Representation*, ed. Robert Falkenfolk (Stanford: Stanford University Press, 1993), 43.

<sup>663</sup> This red thread starts on Pupin, *Immigrant*, 90, and continues throughout, through the drama of a speech he delivered in Serbia where he regretted not defending America from being perceived as materialistic, *ibid.*, 317, right through the end where he connects it with Bilharz, where it began, *ibid.*, 318, and to the very end, *ibid.*, 366.



the second one was sinking deeper and deeper through the shafts of coal and iron mines into the dark caverns of material earth. ‘No action,’ said Bilharz, ‘which needs the assistance of a steam-engine or of any other mechanism can trace its origin to idealism nor can it end in idealism.’ I suggested that every animal body is a mechanism and that its continuous evolution seems to indicate that the world is heading for a definite ideal. Bilharz flew up like a hornet when he heard the word evolution.”<sup>664</sup>

In these early passages, we learn that Bilharz taught Pupin literature (William Cullen Bryant, Longfellow), the classics, and Greek and Latin. One didactic anecdote has to do with politics and idealism, briefly mentioned in the preceding chapter. In response to Pupin’s optimism over democracy in America, Bilharz observes that it is because of human shortcomings that democracy is bound to fail, as it did in ancient Greece, illustrated by the fate that befell Aristides. What is more, he believed that America’s downfall would be Europe’s downfall,<sup>665</sup> a point Pupin never again revisits, except to note that Bilharz found the simplicity of high democratic officials in American to be a “lack of artistic taste on the part of vulgar democracy”,<sup>666</sup> though he does revisit his own optimism regarding democracy, as explained in the preceding chapter of this work. Pupin dismisses Bilharz’s lecture, though he found it interesting, because he associated it with advice deemed inappropriate by assimilated Americans (including an American character, Jim, present during this conversation), who held greenhorn advice with contempt. In this respect, there was tension between the approach towards scientific ideals taken by the old and new world. The new is embodied by Jim, who advises Pupin to “pick up ... new ideas in the New World”.<sup>667</sup> Pupin resolves only to listen to Bilharz for what he learned of Greek and Latin, but not his opinions “of a greenhorn”.<sup>668</sup> Perhaps this is where his inter-culturalism is most visible: his bridging of the ideals of science to a classical education is essentially a bridge

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<sup>664</sup> Pupin, *Immigrant*, 90-91.

<sup>665</sup> *Ibid.*, 92: “He told me a story of Aristides of Athens, who, being requested by a voter to write upon a shell the name of the man who was to be condemned for some crime which was not quite clear to the Athenian voter, wrote down his own name, and Aristides, the just, the noblest character of Athens, was condemned. But the condemnation of this just and noble and innocent man was, according to Bilharz, a condemnation of the Athenian democracy, whose shortcomings brought the downfall of Greek civilization, and he added that the shortcomings of American democracy would bring the downfall of the old European civilization.”

<sup>666</sup> *Ibid.*, 94.

<sup>667</sup> *Ibid.*, 94.

<sup>668</sup> *Ibid.*, 94-5.

between the old and new world. The bridge is none other than poetry, which he marshals in defense of science in the face of Bilharz's criticism of science being materialistic:

"Tyndall's and Hunt's writings [which Pupin describes as "poetry in prose] appealed to my imagination at that time in the same way as Milton's "Paradise Lost," or as Longfellow's "Hiawatha," or as William Cullen Bryant's "Thanatopsis." They convinced me that the Slavs were not the only people who, as I had been inclined to think, see the poetical side of science, but that everybody sees it, because science on its abstract side is poetry; it is Divine Philosophy, as Milton calls it. Science is a food which nourishes not only the material but also the spiritual body of man. This was my pet argument whenever I was called upon to defend science against Bilharz's attacks."<sup>669</sup>

It is because Pupin perceives a poetic side to science and through his knowledge of the canon that he is able to make sense of science in a way that draws on classical values, demonstrated in the extract above by reference to the divine, which he takes from Milton.

Some of the other values, such as diligence and labor, may be illustrated through the character of Tyndall as portrayed in the autobiography. Part of Tyndall's first advice to Pupin is that his "lack of early advantages", namely a scientific training, could be overcome through "redoubling one's efforts",<sup>670</sup> thus, through diligence. He is quoted as wishing to devote the earnings from his lectures to enable other students to enjoy the chance he has enjoyed in studying science.<sup>671</sup> In one of his speeches, he honours the memory of scientists that came before him<sup>672</sup> (we are wont to remember that the encomium was a rhetorical exercise, part of the progymnasmata), and Pupin himself does this in his autobiography, by remembering Tyndall, and urging others to also preserve the memory of "the saints of science".<sup>673</sup> Pupin presents Tyndall as a scientist less interested in immediate returns than in the laborious pursuit of higher endeavours.<sup>674</sup> Tyndall is also quoted as having warned that chairs ought not to be luxuriously endowed so that research would remain the primary

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<sup>669</sup> Pupin, *Immigrant*, 102.

<sup>670</sup> *Ibid.*, 200.

<sup>671</sup> *Ibid.*, 203-4.

<sup>672</sup> *Ibid.*, 204.

<sup>673</sup> *Ibid.*, 234: "The modern nations should not remain indifferent to the memory of the 'saints of science'".

<sup>674</sup> *Ibid.*, 220.

ambition, in this way promoting “pure” science.<sup>675</sup> Finally, Pupin attributes Tyndall with having helped create the National Research Council, which had for its goals, “zeal in search for truth, devotion to duty, which such a search imposes, faith in good ... forever allied to the truth”.<sup>676</sup> These features comply with the ancient Greek notion of *paideia*, described earlier, and also of *arête*, which may roughly be described as moral virtue.

#### 4.1. Atomism and molecular evolution

The set of ideas that will serve as an introduction to this section will be some of those forwarded by Lucretius in *De rerum natura*. Just as we began the chapter on poetry with a non-poetical concept, progress, in order to show how poetry can reside in even such an ostensibly non-related word – for many are the fields united in the metaphorical hierarchy, here we shall begin by leading up to what is ostensibly a poem to show the ‘representative’ ideas it contains.

The same prize that was awarded to Pupin for his autobiography was this year awarded to a book on Lucretius called *The Swerve*, by Stephen Greenblatt, a book contested for making false claims that are not supported by experts in the field, most notably the claim against religion, stating that the ‘rediscovery’ of *De rerum* liberated culture from religious dogmatism. The claim is far from the truth given the reach of a Greek education at that time of history and the fact that Lucretius may have been read even earlier, in the 9<sup>th</sup> to 11<sup>th</sup>, and not only at the time of the ‘discovery’ Greenblatt focuses on in the 15<sup>th</sup> century; it is posited that Dante may even have made references to Lucretius in the *Divine Comedy*—points made in *The Cambridge Companion to Lucretius*, by Michael Reeves, which is hardly esoteric literature for a supposedly well-researched book.<sup>677</sup> While Greenblatt’s

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<sup>675</sup> Pupin, *Immigrant*, 291.

<sup>676</sup> *Ibid.*, 377.

<sup>677</sup> Jim Hinch, “Why Stephen Greenblatt is Wrong—and why it matters,” *LARB* (December 12, 2012), accessed January 5, 2012, <http://lareviewofbooks.org/review/why-stephen-greenblatt-is-wrong-and-why-it-matters#>.

claim that the world became modern with the rejection of God is contested, Lucretius does embody something of modern thought.

Lucretius is representative of some of the shifts in Victorian thought demonstrated thus far in the rejection of the ascetic ideal, the pantheistic view of science, and related ideas that came out of the Renaissance seen in its expressions of pagan materialism.<sup>678</sup> The ‘ethos’ of the book is closely related to the development of a view towards history considered to have an ‘end’ as stated by Kant, finishing in modern thought—and one which ascribes to ancient thought, such as Lucretius’ work, ‘modern’ attributes, thus rejecting the notion of history as an ongoing process, to be *participated with*.

Lucretius’ work is written as a poem, which is noteworthy because his *hero*, Epicurus, shuns poetry as Plato did. The choice for the poetic form was to act as the sugar coating for bitter medicine about the prescribed nature of life. The poetic figures of speech are taken from familiar empirical fact to support hypotheses, which is to say that the poetry possesses aesthetic qualities.<sup>679</sup> One of the heroes of the poem is Epicurus, to whom Lucretius writes: “O thee I follow, glory of the Greeks, / And set my footsteps squarely planted now / Even in the impress and the marks of thine- / Less like one eager to dispute the palm, / More as one craving out of very love / That I may copy thee!- for how should swallow / Contend with swans or what compare could be / In a race between young kids with tumbling legs / And the strong might of the horse? Our father thou, / And finder-out of truth, and thou to us / Suppliest a father’s precepts; and from out / Those scriven leaves of

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<sup>678</sup> Lucretius is known to have influenced Montaigne in his *Essais*, and admired for his skepticism by Théophile de Viau, as a voluptuary by Cyrano de Bergerac, and as an atheist by Denis Diderot. How far these impressions are true are left for another study. His work inspired Erasmus Darwin’s *Temple of Nature*, and his views were much debated by Victorian scientists. At that time, he also inspired Tennyson’s “Lucretius” and Matthew Arnold’s “Empedocles on Etna”. In the 17<sup>th</sup> century Catholic priest and mathematician Pierre Gassendi tried to reconcile his views with Christianity. See Saint-Mark Girardin, *Lectures on Dramatic Literature* (New York: D. Appleton and Co., 1849), accessed October 8, 2012, <http://www.archive.org/stream/lectureson drama00brangoog>.

<sup>679</sup> Stephen Greenblatt, “The Answer Man,” *The New Yorker*, August 8, 2011, accessed October 8, 2012, [http://www.newyorker.com/reporting/2011/08/08/110808fa\\_fact\\_greenblatt#ixzz283B6jfo2](http://www.newyorker.com/reporting/2011/08/08/110808fa_fact_greenblatt#ixzz283B6jfo2). The verse chosen by Greenblatt, author of *The Swerve*, in his article is a prime example of Lucretius’ poetic gift: “First, goddess, the birds of the air, pierced to the heart with your powerful shafts, signal your entry. Next wild creatures and cattle bound over rich pastures and swim rushing rivers: so surely are they all captivated by your charm and eagerly follow your lead. Then you inject seductive love into the heart of every creature that lives in the seas and mountains and river torrents and bird-haunted thickets, implanting in it the passionate urge to reproduce its kind.”

thine, renowned soul / (Like bees that sip of all in flowery wolds), / We feed upon thy golden sayings all- / Golden, and ever worthiest endless life.”<sup>680</sup>

In the atheist scheme of things, the hero is idolised whereas in a work life Pupin’s *The New Reformation*, scientists are lauded for deciphering the language of God: in other words the ideal of God is larger than any single person. Tyndall’s controversial *Belfast Address*, in which he made an argument in defense of materialism, also lauds ‘heroes’, though taking into consideration the scope of his written work, it is hard to say whether he is to be taken literally or whether he was rebelling against the zealots in established faith, whom Arnold called all kinds of names, as already seen.

The bee metaphor was also used by Pupin, who, in “The Bee and the Honey of Science” described inventors as bees who gather the “honey on which we feed. Human society must take care of honey gatherers or honey will be exhausted.”<sup>681</sup> It was also used, as we have seen, by Maxwell in his “Telephone” speech to emphasise the importance of cross-pollination in scholastic work. But the difference in tone between what could be described as the classical metaphorical scheme and that of Lucretius can be illustrated by Pupin’s 1912 speech honoring Marconi at the NY Electrical Society, where he says that there are as many inventors as trees in a wood, but not all of them are men as was Marconi. The difference here is the ethical component, which will be discussed in more detail later.

This very superficial digression is necessary if to underline the difficulties of delineating ideas at a time when polymathy was ripe. We could describe it as a poetic attempt at world building. All too easily today it is said there is no common ground between the later materialists, pantheists, or deists. That this is not true may be illustrated by Maxwell’s thoughts on Lucretius. Maxwell, as we know well from Campbell’s biography, was a pious man, but he subscribed to Lucretius’ views on empty space<sup>682</sup> and

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<sup>680</sup> Lucretius, *De Rerum Natura*, ed. William Ellery Leonard (Boston: E.P. Dutton, 1916), accessed December 1, 2012, <http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.02.0131%3Abook%3D3%3Acard%3D1>.

<sup>681</sup> Pupin, Michael, “The Bee and the Honey of Science”, *Popular Research Narratives*, Vol. II (Baltimore: The Williams and Wilkins Company, 1926), v, accessed January 1, 2012, <https://archive.org/details/popularresearchn02engi>.

<sup>682</sup> Campbell, *Maxwell*, 78-9.

compared man's free will to Lucretius' atoms.<sup>683</sup> Similarly, Pupin, a vocal defender against materialism, lauds Tyndall in his autobiography and attributes to him the founding of the National Research Council, which is the practical manifestation of his ideals of intellectual coordination.<sup>684</sup> In other words, such assigning of a polymath to enemy camps is not quite accurate because they read each other's works, and incorporated each other's ideas, even from philosophers they disagreed with,<sup>685</sup> in their works. This could be explained by Arnold's definition of "sweetness and light" or "perfection" which frees one from the "machinery" of any particular camp—be it religious, class, and so forth. "No man who knows nothing else knows even his Bible,"<sup>686</sup> he writes. Loss of totality is evil,<sup>687</sup> "what we want is a freeplay of thought upon our routine notions."<sup>688</sup> Even Tyndall falls into this camp. In much popular literature he is referred to as a strict materialist, while others have pointed to the pantheistic moments in his writings, as well as to his enjoyment of mountaineering and his appreciation and writing of poetry. He is at his most poetic in his work on the Alps<sup>689</sup> and closest to Emerson there, though the work never quite escapes the tone of a zealous scientist's diary. His literary leanings are best expressed through his admirably accessible approach to science in his popular lectures and when he begins a lesson about science with a literary reference, although such pleasant introduction is often only to be shot down as inferior to science. We have already seen that Pupin's gloss on Tyndall's writing was that it was as appealing to the imagination as poetry, demonstrative of the poetical side of science, inspiring him to think of science as "a food which nourishes

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<sup>683</sup> Campbell, *Maxwell*, 223. This said, he argues, overall, that those who study physical science should be concerned with the stabilities and continuities as opposed to the instabilities and singularities, which he rightly imagines ultimately promotes "determinism which seems to arise from assuming that the physical science of the future is a mere magnified image of that of the past," *ibid.* 225. This is what can be seen in *The Swerve*.

<sup>684</sup> Pupin, *Immigrant*, 377.

<sup>685</sup> "IN the very beginnings of science, the parsons, who managed things then, Being handy with hammer and chisel, made gods in the likeness of men; Till Commerce arose, and at length some men of exceptional power Supplanted both demons and gods by the atoms, which last to this hour." From "The British Association 1874," in Campbell, *Maxwell*, 338.

<sup>686</sup> Arnold, *Culture*, 113.

<sup>687</sup> *Ibid.*, xxxiv.

<sup>688</sup> *Ibid.*, 121.

<sup>689</sup> E.g. John Tyndall, *The Glaciers of the Alps and Mountaineering* (London: J.M. Dent and New York: E.P. Dutton and Co., 1861), accessed October 8, 2012, <http://archive.org/stream/glaciersofalpsmo00tynduoft#page/n9/mode/2up>.

not only the material but also the spiritual body of man.”<sup>690</sup> Yet it must be observed that although Tyndall was amused at Pupin’s (and his mother’s) descriptions of spiritual science,<sup>691</sup> he did not necessarily subscribe to such views himself.

Tyndall is elusive and it is hard to be certain of any lines drawn around him. In many ways, it was Tyndall’s own *Belfast Address*, delivered at the British Association meeting of 1874, that sought to draw a strict line between atomists, and those believing in a Creator. The laws of science demand that the gods be swept from the field of theory, he wrote. Those who did not accept materialist beginnings were “biased”, not “clear-headed”. Those who attacked *On the Origin of Species* had either not read it or not understood it. (Even Pupin made adopted the notion of evolution, which he uses as support for the final point in his autobiography about the ideal of democracy.) He said that nature does things without the meddling of gods; that matter possesses “latent powers” notwithstanding “professed” reverence for a Creator. He ends saying, “I thought you ought to know the environment, which, with or without your consent, is rapidly surrounding you.” And implies it is intellectual death to deviate from the materialistic course he expounded; that to disagree with the views he outlined would be “dogmatism, fanaticism, and intolerance”. If a line had been drawn between different stands, it was drawn by Tyndall in this single speech, where he also allocated religion to the emotions, and science to knowledge, and referred to “the school of philosophy and its verbal wastes” (yet later admits to “the moral glow of Socrates, which we all feel by ignition”—only to advise his audience that “some adjustment on your part may be necessary”). He does concede that science does not “divorce itself from literature” but ultimately argues that it is only by controlling “Mystery” can the “creative faculties of man” be brought into play.<sup>692</sup>

This is a sharp distinction that is not as readily visible in the work of other scientists at his time (apart from Huxley’s). For example, while Maxwell believed in God, he felt

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<sup>690</sup> Pupin, *Immigrant*, 102.

<sup>691</sup> Ibid., 209: “He [Tyndall] liked my mother’s expressions, ‘temple consecrated to the eternal truth’ and ‘The icons of the great saints of science.’”

<sup>692</sup> Tyndall wrote an entire book on the imagination, *Scientific Use of the Imagination* (London: Longman, Greens, and Co., 1872), accessed October 8, 2012, <http://archive.org/stream/scientificuseim00tyndgoog#page/n6/mode/2up>.

very certain that religion be kept as one's personal affair.<sup>693</sup> He went so far as to advise a Bishop to leave science out of explanation of Genesis. Considering that his faith is most apparent in his private writings, and not his science, it is rather ludicrous to think of applying the words "dogmatism, fanaticism, and intolerance" to Maxwell's approach to his work. They do not apply. And the categories Tyndall seeks to divide merely leave him in the quandary of trying to bridge, through intellect alone, the theory of a human-based Artificer and the phenomenon of nature: "there is no motor energy in the intellect to carry it without logical rupture".<sup>694</sup> While Tyndall was not the first scientist to form a rift with the pious scientists, Babbage's antagonism towards Whewell's writing in some ways paved the road for Tyndall's *Belfast Address* in his *Ninth Bridgewater Treatise*,<sup>695</sup> Tyndall was perhaps the first to draw such a sharp line from an official position of authority, within an official body, who he was addressing. It is curious to understand this and then to compare the saintly (and saint-friendly) image of Tyndall in Pupin's autobiography, which never even suggests the *Belfast Address*, even though it is of considerable significance to the history of science. This aspect of the story of science does not get told by Pupin.

Though Tyndall was ambivalent on certain matters, leading some to speculate as to whether he was a materialist or pantheist, though a strong case is made for the latter,<sup>696</sup> or what his stand was on the importance of literature as opposed to science, he addressed both his and opposing views. Similarly, Maxwell, coming from another angle, also addressed

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<sup>693</sup> E.g. Campbell, *Maxwell*, 203.

<sup>694</sup> John Tyndall, "Address Delivered before the British Association Assembled at Belfast: With Additions" (London: Longmans, Green and Co, 1874), 59, accessed October 8, 2012, <http://archive.org/details/addressdelivere03tyndgoog>.

<sup>695</sup> Which was his answer to Whewell's faithful, official, third volume of the same series, specifically to Whewell's comment: "We may thus deny to the mechanical philosophers and mathematicians of recent times any authority with regard to their views of the administration of the universe". In *Ninth*, Babbage wrote that theistic claims were vacuous, abstract, and devoid of empirical evidence. Through examples of calculus and mathematics he claimed that the miracle "only appeared to be an exception to the ordering sequence". He used a calculating engine to demonstrate his understanding of God as divine programmer setting complex laws that to laics always appear as miracles.

<sup>696</sup> Ruth Barton, "John Tyndall, Pantheist: A Rereading of the Belfast Address," *Osiris* 3, 2nd series (1987): 111-134, accessed August 7, 2011, <http://www.jstor.org/301756>. Barton, drawing on some of Tyndall's earlier writings, draws on sentences he wrote like, "what are sun, stars, science, chemistry, geology, mathematics, but pages of a book whose author is God! I want to know the meaning of this book". Barton concludes this passage of her essay, writing, "These are remarkable assertions from a physicist who was a mechanist. He preferred the organic analogy of the universe as tree to the mechanical analogy of the universe as clock," 127.



these multiple topics, and of especial interest to us here is that he often addressed these topics in his *poems*. So while he did science, poetry remains an important repository of his overall system of thought. Of course, in Pupin's autobiography, while poems are important, what is of especial significance is that science is poetry. Indeed, in the examples given in this paragraph, it may be seen how all manner of philosophical systems (we are reminded of the system that becomes systems as proclaimed by Heidegger) flourished in scientific dialogue at this time. In this respect, Pupin's poetic story of science and its role in the universe is one story of many contested but nonetheless audible stories.

In Maxwell's poem called "Molecular Evolution" he writes, "What combination of ideas, Nonsense alone can wisely form! What sage has half the power that she has, To take the towers of Truth by storm?" In a later essay on whether physical science favours "Determinism over Free Will", he acknowledges Tyndall's insistence on, "recent developments of Molecular Science", which, he notes, "seem likely to have a powerful effect on the world of thought" (i.e. not just science, but general ontology and epistemology).

In this essay, he writes that the free will is like, "Lucretius' atoms, which at quite uncertain times and places deviate in an uncertain manner from their course. In the course of this our mortal life we more or less frequently find ourselves on a physical or moral watershed, where an imperceptible deviation is sufficient to determine into which of two valleys we shall descend." Apart from demonstrating an intimate knowledge of the human experience, which is the trait of a skilled writer, he gives multiple examples of how it is exactly that molecular science has an effect on thought. The discussion then delineates between free will and determinism: the former, claiming *Ego* to determine our course of action; the latter, a *previous condition*. He explains that if science focuses on the anomalies rather than continuities of things, science will become Deterministic: "which seems to arise from assuming that the physical science of the future is a mere magnified image of that of the past." Ironically, this seems to be the purpose of the Pulitzer-winning *The Swerve*.

Pupin's discussion of disordered atoms is limited to a single passing observation that those who consider the world to be chaotic are pessimists.<sup>697</sup>

Maxwell, whose story of science is philosophically more complex than Pupin's, outlines further dangers of the impact of molecular science on thought in another essay also written towards the end of his life, in which he critiques the attempt to project onto man certain fashionable ideas in science, like seeing society as an organism. (He often compares the British Association to Hobbes' *Leviathan*,<sup>698</sup> as seen in the poem extracted below.) If man is built of atoms, Maxwell asks, "Have the thoughts of the man any relation to the thoughts of atoms or of one or more of them?" His essay ends with the point that because when we say "I am", no two men have the same idea of what this means, there can be no science of man. And as for the technique, adopted by Lucretius, to personify certain aspects of science, Maxwell remains critical. One is wont to infer that to personify atoms is to strip man of the creative agency of his own free will, because the application of the ideas that emerged from atomism have been practically applied in scientism seeking to make of man a science, which—we have seen—was not Maxwell's view, for one. Also, Maxwell's view was that mind is only matter in the form in which it exists, not matter itself, which must have been created. While Maxwell did not subscribe to determinism, a popular book at that time was Voltaire's *Zadig*, which aside from being a historical fantasy presents human life in the hands of a destiny beyond human control. Huxley praised *Zadig* in *On the Method of Zadig*,<sup>699</sup> writing that the foundation of Zadig's argument was "that we may conclude from an effect to the preexistence of a cause competent to that effect". We see, therefore, a battle of ideology. That Pupin's autobiography did not engage in this battle may be interpreted in terms of its having been written for a wide audience, its emphasis on idealism, which did, after all, take a stand on the matter indirectly by promoting order in the universe, its having no reason to address questions already answered by religion, its assessment of the old world and historically-laden thinking of the greenhorn, or another reason not divined here.

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<sup>697</sup> Pupin, *Immigrant*, 384.

<sup>698</sup> The *Leviathan* is a large sea monster representing the "wriggling serpent" that will be killed at the end of time (Isaiah 27.1). Hobbes' version is the structure of society, illustrated by the frontispiece where a giant crowned figure is comprised of hundreds of men, reigning over earthly and church power.

<sup>699</sup> Thomas Henry Huxley, *On the Method of Zadig*, accessed October 8, 2012, <http://www.gutenberg.org/files/2627/2627-h/2627-h.htm>.

Perhaps he did not feel the debate to pose any real problems because he was on friendly terms with Tyndall; whatever the reason for his not addressing it more directly, it ought not be neglected from analysis of his book considering its import in the field of science.

The debate over these issues spilled over from lectures into periodicals and also into books like the *Bridgewater Treatises*. Maxwell's poem "The British Association, 1874" was his response to Tyndall's claim delivered in the *Belfast Address* that the "highest achievements of the human spirit are theoretically deducible from molecular activity in the primal cloud of gasses."<sup>700</sup> Interestingly, Maxwell's poem hints at Ruskin's reaction to the same, circulating during this meeting, though more on this later. Maxwell writes: "IN the very beginnings of science, the parsons, who managed things then, / Being handy with hammer and chisel, made gods in the likeness of men; / Till Commerce arose, and at length some men of exceptional power / Supplanted both demons and gods by the atoms, which last to this hour. (...) / From nothing comes nothing, they told us, nought happens by chance, but by fate; / There is nothing but atoms and void, all else is mere whims out of date! / Then why should a man curry favour with beings who cannot exist, / To compass some petty promotion in nebulous kingdoms of mist? / But not by the rays of the sun, nor the glittering shafts of the day, / Must the fear of the gods be dispelled, but by words, and their wonderful play. / So treading a path all untrod, the poet-philosopher sings / Of the seeds of the mighty world—the first-beginnings of things; / How freely he scatters his atoms before the beginning of years; / How he clothes them with force as a garment, those small incompressible spheres! / (...) Last, praise we the noble body to which, for the time, we belong, / Ere yet the swift whirl of the atoms has hurried us, ruthless, along / The British Association—like Leviathan worshipped by Hobbes, / The incarnation of wisdom, built up of our witless nobs, / Which will carry on endless discussions, when I, and probably you, / Have melted in infinite azure—in English, till all is blue."<sup>701</sup>

In the verses cited, Maxwell, like Arnold and Ruskin, partly blames greed and wealth for contemporary problems, which here include indoctrination to a trend, not truth, of science, and as an untruth, its only means to gain credibility is through clever turns of the

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<sup>700</sup> Paul L. Sawyer, *Ruskin's Poetic Argument: The Design of the Major Works* (Cornell: Cornell University Press, 1985), accessed October 8, 2012, <http://www.victorianweb.org/authors/ruskin/sawyer/11.html>.

<sup>701</sup> In Campbell, *Maxwell*.

phrase. (We remember that Pupin's Tyndall was also presented as wishing for modesty in chairs and had as his sacred background the eternal truth.)<sup>702</sup> In other words, the Word is replaced by an image, not reality, of the world, painted by words. He ends with a cynical stand towards the scientific body that gave Tyndall the podium for his *Belfast Address*, adding that disputes over the origin of the universe would continue until his readers "have melted in infinite azure", i.e. passed on. The ending of Maxwell's poem is particularly significant, because reference to it appears in one of the later reprints of Tyndall's *Belfast Address*, which significantly came out in at least two versions: in September 1874 and December of the same year. The difference in the speeches is almost imperceptible: it is in but the closing that they differ. And it seems that the newer ending was influenced by the end of Maxwell's poem, which was published in *Blackwood's Edinburgh Magazine* in November.<sup>703</sup> Though published anonymously, it is said that the poem's author soon became known.<sup>704</sup> It is possible that the Tyndall that Pupin met was not quite the same man that delivered the *Belfast Address*.

The ending of the text that remains the same, before the closing paragraphs that differ, is as follows: "that each succeeding age must be held free to fashion the Mystery in accordance with its own needs—then, casting aside all the restrictions of Materialism, I would affirm this to be a field for the noblest exercise of what, in contrast with the knowing faculties, may be called the creative faculties of man." This sentence illustrates the ambiguities concerning how much of a materialist Tyndall was. We remember that Pupin presented him as an idealist like himself and not a materialist. But what is relevant to us here is that the dialogue concerning materialism was, in part, a literary endeavour. Scientists were prolific writers of multiple genres addressing a broad range of subjects including abstract materialism in writing that contained, as we shall see, literary references and anecdotes. The fact that Pupin himself dedicates a significant part of his autobiography to argue against materialism and defend the role of science as primarily being *not* materialistic speaks directly to the spirit of that age. (Tyndall himself says in his *Address*,

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<sup>702</sup> Pupin, *Immigrant*, 203 and 321.

<sup>703</sup> James Clerk Maxwell, "British Association, 1874," *Blackwood's Edinburgh Magazine* 166, November 1874, 582-3.

<sup>704</sup> P.M. Harman, ed., *The Scientific Letters and Papers of James Clerk Maxwell* (Cambridge: Cambridge University Press, 2002), 118-9.

“No rank materialism here”.) And that spirit was still rich in literary finesse. To stay with the example of the *Belfast Address*, which—we are wont to remember was delivered at a scientific meeting—we may see even there several different uses of literary technique and reference. While Socrates is criticized, Tyndall himself uses a variety of Socratic dialogue in his imagined and reasonably lengthy conversation between Bishop Butler and Lucretius. His description of meeting with Agassiz—Darwin’s opponent—with the autumn trees described as a sort of sentimental prop in the background<sup>705</sup> cleverly distracts from the rhetorical technique he uses to trump up his claim that ‘even’ Agassiz admits Darwin’s “success”. He writes of the “poetic thrill” of Spencer, and, by extension, Darwin. He quotes Darwin quoting Goethe, and ends the speech with an extract from a poem.

The September edition of Tyndall’s *Belfast Address*, which is likely the same text that appeared in *Nature* magazine on 20 August 1874 given that the former text is the one that appears to enjoy the greatest reproduction,<sup>706</sup> ends with Goethe’s statement, “Fill thy heart with it”, and an excerpt from Wordsworth’s “Lines Written a Few Miles Above Tintern Abbey”, known to be a predominately pantheist poem, the excerpt ending with the lines: “A motion and a spirit, that impels / All thinking things, all objects of all thought, / And rolls through all things.”<sup>707</sup>

In contrast, the December edition of his speech ends with what seems to be a direct reference to Maxwell’s poem. The changed text—and the one most frequently cited by those seeking to justify Tyndall as more of a pantheist than materialist<sup>708</sup>—ends: “Here,

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<sup>705</sup> “One of the many times I had the pleasure of meeting [Agassiz] in the United States was at Mr. Winthrop’s *beautiful* residence at Brookline, near Boston. Rising from luncheon, we *all halted as if by a common impulse* in front of a *window*, and continued there a discussion which had been started at table. *The maple was in its autumn glory; and the exquisite beauty of the scene outside* seemed, in my case, to *interpenetrate without disturbance* the intellectual action. *Earnestly, almost sadly*, Agassiz turned, and said to the gentleman standing round, ‘I confess that I was not prepared to see this theory received as it has been by the best intellects of our time. Its success is greater than I could have thought possible,’” *New Fragments Vol. I and II*. All emphasis added.

<sup>706</sup> Appearing on *Victorian Web*, an academic internet repository of Victorian studies, as the one and only authentic version of the speech. See [http://www.victorianweb.org/science/science\\_texts/belfast.html](http://www.victorianweb.org/science/science_texts/belfast.html). I was unable to access the relevant issue of *Nature* magazine. An 1879 reproduction of the speech tacks the “azure” ending on after the “Goethe” ending. See Tyndall, *New Fragments Vol. I and II*.

<sup>707</sup> Tyndall, “Belfast Address,” *Nature*, August 20, 1874.

<sup>708</sup> E.g. Paul Sawyer, “Ruskin and Tyndall,” in *Victorian Science and Victorian Values: Literary Perspectives* (April 1981): 217-246, accessed October 8, 2012, <http://onlinelibrary.wiley.com/doi/10.1111/j.1749-6632.1981.tb20707.x/abstract>.

however, I touch a theme too great for me to handle, but which will assuredly be handled by the loftiest minds when *you and I*, like streaks of morning cloud, *shall have melted into the infinite azure of the past.*"<sup>709</sup> (Emphasis added for easier comparison with the last line of Maxwell's "British" above.)

Ideas were published, modified, discussed. There was dialogue among these polymaths—dialogue that was even conducted across fields: as in the case of Ruskin's treatment of Tyndall in his works, Tyndall's limited correspondence with but significantly-declared debt to Emerson, Pupin's friendship with Nikolaj Velimirović,<sup>710</sup> and so on.

It is argued here that the rift that preceded the Heideggerian many systems that replaced the one system, and preceded in turn the fragmentary systems of art, began most significantly through the *Belfast Address*, and resulting disagreement among members, such as W.G. Ward's Christian horror at Huxley, and Huxley's argument, like that of Tyndall's, that intellectual degradation would ensue from Ward's (Christian) views. The Victorians were the last generation to attempt to maintain a common context of ideas even if those ideas were at odds. This is illustrated in Pupin's autobiography by the special role played by Bilharz, whose old world ideas seem backwards to Pupin who nonetheless finds him an authoritative source of knowledge and dear friend, but who piqued his conscience regarding the charge of scientific materialism. One of the greatest legacies of that age, and of which there is a dearth today, is ready consideration of the moral implications of scientific ideas. An example would be W.K. Clifford's consideration of Darwin. The abolition of the short-lived Metaphysical Society, whose diverse members included Ward and Huxley, illustrates the breadth of the common intellectual context and the extent of its successive fragmentation. No sooner did the cultural political elite begin to attempt to embrace all aspects of culture and society than society became specialized. For some, this happened sooner than for others. Pupin, who lived until 1935, although a prominent scientist and writer was not quite the polymath, like Bertrand Russell, deemed by some to be the last Victorian (d. 1970). The critical, which has the capacity for the polyglossia of different

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<sup>709</sup> Tyndall, *Belfast*. Maxwell's poem ends, "Which will carry on endless discussions, when I, and probably you, Have melted in infinite azure – in English, till all is blue."

<sup>710</sup> Nikolaj Velimirović, "Episkop Nikolaj govori nama o Mihajlu Pupinu," *Politika* 9637 (17 Marta, 1935), C.U. Rare Books, M.S. 1035: "Nije on bio samo moj prijatelj nego celog čovečanstva."

voices and views, partly ceded to the dogmatic, supported by mere casuistry,<sup>711</sup> though it is important to note that within the field of literary criticism, a strong argument is made for the classification of casuistry to be relegated to modernism, as new pathways out through postmodernism are forged as the struggle to regain the *poesia* characteristic of the polymathic age continues.<sup>712</sup>

Part of this separation was the result of earlier philosophical shifts. Of particular influence were Spinoza's monads—the finite individual substances of natural atheism, to secure an ontological distinctness from God. Herder combined monism with an emphasis on individuality, leading to an evolutionary point of view, stressing the notion of “progress”.<sup>713</sup> It is interesting to consider how much individualism, already considered here in terms of the gaze that looks inwards, has in combination with the notion of progress influenced art. The examples of Whitman, specifically his *Song of Myself*, and D'Annunzio's verse may serve as effective examples. The philosophy and social element forwarded by Pupin was only individualistic insofar as this represented the professional achievement of experts in any given field; as a whole, society was to work together, as we have already seen, in a creative coordination.

Comteanism, also mentioned in the previous chapter, through a faith in the shared rationality of both the human observer and natural phenomenon, was central to the positivist's rejection of theological or metaphysical modes of understanding. This opened the door to relativism and the solipsism of ungrounded romantic imagination.<sup>714</sup> Changes in historiography led to a sense of control over subject matter.<sup>715</sup> Science controlled technology and machinery for its own purposes, leading to the breakdown of more traditional moralities.<sup>716</sup> In terms of these shifts, while Pupin may be said to have had faith

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<sup>711</sup> Young, “Natural Theology.”

<sup>712</sup> Jerkov, Aleksandar (paper delivered in Paris in November 2014).

<sup>713</sup> John Herman Randall, “Romantic Reinterpretation of Religion,” *Studies on Romanticism* 2, no. 4 (Summer 1963): 189-212, accessed October 8, 2012, <http://www.jstor.org/stable/25599592>.

<sup>714</sup> Brantlinger, “Companion to the Victorian Novel,” 125.

<sup>715</sup> Dupré, *Passage to Modernity*, 150.

<sup>716</sup> Burke, *Permanence*, 4. E.g. the laying of the hands was replaced by considerations of service and interest, affecting our religious, ethical and aesthetic judgment, *ibid.*, 45

in science, we have also seen his insistence on science being moral;<sup>717</sup> what is more, he considered science to play a theological role,<sup>718</sup> and as such he did not partake of the emerging trends of specious specialization and secularization. “Beginning with a plea for the separation of church and state, we formally inaugurate the dissociative process that will end with the theoretical separation of everything,” Burke writes of the changing attitudes towards history.<sup>719</sup> By contrast, “Any point of reference by which a philosophic corrective of the scientific rationalization would be guided must almost necessarily show some superficial affinity with the religious rationalization. For man is essentially human, however earnestly he may attempt to reshape his psychological patterns in obedience to the patterns of his machines”.<sup>720</sup> Similarly, Randall—not unlike Arnold—explains religion as a poetic, imaginative celebration of life, or a prophetic clarification of the values of social idealism.<sup>721</sup> In this way, a deep parallel may be drawn to Pupin’s autobiography, which centers on poetry (we have noted his explanation of the poetry of science) and ends with social idealism (Pupin’s ideal democracy, centered on creative coordination).

It may be posited that Pupin was set apart from some of his contemporaries for his respect for the past: although, for example, he did not agree with Bilharz, he took to his tutoring of ancient tongues and literature, and continued to make references to the classics throughout many of his speeches and much of his writing. In his autobiography, one interesting reference is his comparison of ancient Greek sacrifices to the importance of lauding the achievements of modern day scientists: “The Greeks of old sacrificed to their gods a hecatomb of oxen whenever one of their philosophers discovered a new theorem in geometry, and the philosopher’s memory was praised forever. The modern nations should not remain indifferent to the memory of the ‘saints of science’”.<sup>722</sup>

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<sup>717</sup> Pupin, *Immigrant*, e.g. 377, where he writes of the “this zeal for truth as truth, this faith in the good forever allied to the truth, this devotion to duty, as the result of such faith and zeal”.

<sup>718</sup> *Ibid.*, 378: “The National Research Council will not interfere with the spiritual development of our national life, but that, on the contrary, nothing else will advance that spiritual development so rapidly and so irresistibly”, and, “A life guided by aims and aspirations such as he describes is a life of saints and not of ordinary materialistic clay. Such a life cannot be attained without unceasing nursing of the spirit and unrelenting suppression of the flesh.”

<sup>719</sup> Burke, *Language*, 171-2.

<sup>720</sup> Burke, *Permanence and Change*, 63.

<sup>721</sup> Randall, “Romantic Reinterpretation.”

<sup>722</sup> Pupin, *Immigrant*, 196.



For many, though, particularly in the following generations, ancient modes of knowing were cast aside: “Intent on establishing a timeless and universal truth they resisted wasting precious time on the study of a past which had failed to attain the truth.”<sup>723</sup> Another explanation for this move against historicism is that there was a fear of the future, of revelation, civil unrest, an overturning of tradition not concerned with realistic portrayal of contemporary reality.<sup>724</sup>

Cartesian thought led both to a mechanistic view of the world as well as to the idea that there is but a single method to reach the truth. According to Burke, Copernican astronomy and Galilean physics and the Baconian rationalization of the inductive method formally established the secular as point of reference.<sup>725</sup> Whereas in ancient thought, exact science was invaded by faith, in modern science, faith is usurped by science,<sup>726</sup> and empirically isolating individualism. This runs counter to Pupin’s final words on the community of an ideal democracy: “coordinating the non-coordinated activities of the many millions of individuals of a great community”.<sup>727</sup> Kristeva has written much about the consequences to the individual of resulting philosophical freedom; Auerbach has written of this from Dante on: when the use of the vulgar language creates antagonism with traditional language and individual man turning against the supposedly indestructible historical order; in his paper on “Romantic Movements in Antiquity,” Ogle writes that a decay of values on which civilization was built, and decline in tradition, led some in despair to a defense of individualism or to escape by recommending esoteric Oriental philosophy which had no serious relation to the conditions confronting them.<sup>728</sup> Perhaps the search for transcendence occurs when man faces himself with the extremes of individuality. The shift toward ‘individualism’ is nicely defined by S.G. Ward who observes that while Greek characters

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<sup>723</sup> Dupré, *Passage to Modernity*, 157.

<sup>724</sup> Said, introduction.

<sup>725</sup> Burke, *Language*, 44.

<sup>726</sup> S.G. Ward, “Criticism,” in *Aesthetic Papers*, ed. Elizabeth Peabody (Boston, NY: G.P. Putnam, 1849), accessed October 8, 2012, [www.archive.org/details/aestheticpapers00peabrick](http://www.archive.org/details/aestheticpapers00peabrick).

<sup>727</sup> Pupin, *Immigrant*, 387.

<sup>728</sup> Marbury B. Ogle, “Romantic Movements in Antiquity,” *Transactions to the Proceedings of the American Philological Association* 74 (1943): 1-18, accessed October 8, 2012, <http://www.jstor.org/stable/283585>.

were subordinated to the general action of the piece, leading to propriety and harmony, as of Hamlet, the piece is subordinated to the character.<sup>729</sup>

No such subordination exists in Pupin's work, which begins—and ends<sup>730</sup>—with the stars in the Psalms, compares scientists to saints, and relates the science he has learned about to God,<sup>731</sup> in prose that takes for another of its major themes poetry.<sup>732</sup> Yet, in his views, he was pursuing but one of the avenues open to the man of his time. Even prior to the Victorian age, Renaissance pantheist figures abounded, like the complex Giordano Bruno, whose *erici furori* also belongs in the discussion of the crossover between science and poetry, being a poem about science. His God seems rather like Tyndall's, if we agree he had one to the end, "surpassing his unfolding in nature so greatly as to remain closed to human understanding."<sup>733</sup> The great distance between man and God had an influence on the language of piety, which became specialized and remote from the main concerns of modern life.<sup>734</sup> The world fractured into a, "mechanist world picture, a classicist aesthetics, and a theological scholasticism."<sup>735</sup> Dupré writes: "If the change had consisted merely in an attempt to adjust medieval theology to a heliocentric cosmology, it would have caused no serious crisis. But, more fundamental, modern thinkers, even before the advent of the new cosmology, had begun to revise the accepted idea of transcendence in a way that transformed the concept of a power hierarchically transmitted from *beyond* into a source of power *within* the universe whereby God's presence permeated all parts at once... views on transcendence [of Cusanus, Telesio, Bruno, Spinoza] never entered the mainstream of modern religious thought, but their ideas have resurfaced in major thinkers of recent times

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<sup>729</sup> Ward, "Criticism."

<sup>730</sup> Pupin, *Immigrant*, 381: "Fifty years ago, instructed by David's psalms, I found in the light of the stars a heavenly language which proclaims the glory of God, but I did not know how that language reached me, and I hoped that some day I might find out. ... To-day science tells me that the stars themselves bring it to me."

<sup>731</sup> *Ibid.*, e.g. 382, a passage from the end to demonstrate these beliefs remained with him to the end: "The light of the stars is a part of the life-giving breath of God. I never look now upon the starlit vault of the heaven without feeling this divine breath and its quickening action upon my soul."

<sup>732</sup> See *ibid.*: 63, 129-30, 133, 135, 138, 140, 150; 102, 176-7.

<sup>733</sup> Dupré, *Passage to Modernity*, 183.

<sup>734</sup> *Ibid.*, 223.

<sup>735</sup> *Ibid.*, 248.

– from Hegel to Whitehead. The search for an adequate conception of transcendence appears far from finished.”<sup>736</sup>

The rift that appeared through the *Belfast Address* therefore represents the cumulation of a shift in thought that had begun much earlier, though the existence of this shift does not preclude that thinkers like Pupin were a part of it. It is argued here that just as Pupin learned of the past through Bilharz, Adelphi, and Columbia, we may also revisit the past through consideration of Pupin. Ricoeur writes, “Nothing is more necessary today than to renounce the arrogance of critique and to carry on with patience the endless work of distancing and renewing our historical substance.”<sup>737</sup> And Dupré advises, vis-à-vis the major rift in ontology and epistemology: “While anxiously seeking a new wholeness we must nevertheless carefully protect those fragments of meaning that we possess, knowing that they may be the bricks of a future synthesis.”<sup>738</sup>

#### 4.2. A mountainous aside

While much has been written on how thought shifted in the 19<sup>th</sup> century towards the dependence of mind on matter, we are primarily interested in the influence this had on literature. Thus far, we have seen *De rerum* as both a poem and an exposition of ideas; *Temple of Nature* as similar; *Maxwell’s* poems and essays on atomism (rich in their literary content); Pupin’s “literary scientific system” in which he absorbs Tyndall’s “poetic” heat into a new “Creative” system of his own, and a metaphysical one at that. As Tyndall was also known for his poetic writing, and claims he owed his technique to Emerson, further attention will be devoted to him here, particularly given the significant role he played in Pupin’s autobiography.

In Tyndall’s *Belfast Address*, he reworks Maxwell’s exposition of atomism in order for it to support his own cause, invoking Kant in the place of Maxwell’s argument for a Creator. That said, and while it has been shown that Tyndall’s views shifted over time and

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<sup>736</sup> Dupré, *Passage to Modernity*, 252-3.

<sup>737</sup> Paul Ricoeur, “Science and Ideology,” in *From Text to Action: Essays in Hermeneutics II* (Evanston: Northwestern University Press, 1991), 269.

<sup>738</sup> Dupré, *Passage to Modernity*, 253.

according to what he was trying to achieve in specific debates, he did argue that science, through its limitations, maintained mystery.<sup>739</sup> He admitted there were mysteries beyond science<sup>740</sup> and it some critics argue that Tyndall was more of a pantheist than a materialist because he found mystery in every particle.<sup>741</sup> While he attacked the accommodation between science and religion in natural theology, he sought accommodation elsewhere—in the supernaturalism of Carlyle and German Romantic Idealism.<sup>742</sup> The latter was interpreted by Randall, whose investigation of the history of ideas brought him to considerable focus on Romanticism, as a bid to overcome, “the dualism of God and nature, man and the universe, mind and matter. A new conception of nature was central. As art turned from order to passion, appreciation of nature shifted from formal gardens to mountain scenery”—which explains the mountaineering adventures of scientists with a poetic bent like Tyndall,<sup>743</sup> who wrote a book on *The Glaciers of the Alps*, as well as Pupin. Pupin relayed his mountaineering experience to Tyndall, and gives a several-page account of his ascent of the Alps.<sup>744</sup> Essentially, not only does he go rowing and like William Tell jump into the water fully-clothed, trusting he would dry off in the sun, he further indulges in the careless energy of youth by undertaking a climb for which he was barely fit enough and prepared. He recounts the criticism this garnered: both from the innkeeper and an English tourist, who similarly remarked that to not become injured on such endeavors is thanks to the intervention of one if not several guardian angels.

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<sup>739</sup> Barton, “Johnny Tyndall,” 133.

<sup>740</sup> Ibid., 117.

<sup>741</sup> E.g. ibid., 116.

<sup>742</sup> Ibid., 122.

<sup>743</sup> In his *Glaciers of the Alps*, he writes such poetic sentences as (and here referring to the Jungfrau). “Surely, if beauty be an object of worship, these glorious mountains with rounded shoulders of the purest white, snow-crested, and star-gemmed, were well calculated to excite sentiments of adoration.” Also see Lizzy Lind-af-Hagbey, *Mountain Mediations* (London: George Allen & Unwin Ltd, 1917), accessed October 8, 2012, <http://www.gutenberg.org/files/29277/29277-h/29277-h.htm>. Incidentally, the birth of mountaineering emerged through the confluence of at least three factors: railroad travel, the Romantic concept of the sublime, and the Victorian development of exploration, leisure, exercise, and science, which transported and drew tourists to the Alps. Mount Everest got its English name from geographer George Everest, whose daughter worked with Babbage. There are many interesting stories about Victorian science and mountaineering.

<sup>744</sup> See Pupin, *Immigrant*, 146-50, especially 149, where he quotes Longfellow in connection with, as well as 208 in conversation with Tyndall about mountaineering, and 331.

More research would be required to determine whether Pupin's relating to Tyndall, "the anxiety I caused to my English acquaintances" as he mountaineered in Switzerland<sup>745</sup> was because he knew of Tyndall's similar fearless approach, as published in his *Glaciers* in 1860.<sup>746</sup> Certainly, though, the more one researches the various facets of the age, the more apparent their interconnections. Mountain-based activities, not just mountaineering, were popular at the time; another related activity being the study of mountainous geology, which interested Tyndall and also Ruskin.

At that same British Association assembly in 1874 when Tyndall delivered his *Belfast Address*, Ruskin circulated an objection against Tyndall regarding his stand on glaciers, and sought to expose "the degree in which general science is corrupted and retarded by these jealousies of the schools". Ruskin correctly understood that Tyndall's views on glaciers and criticism of the scientist Forbes, whose career he ultimately destroyed, did not actually contradict each other.<sup>747</sup> Through the kind of laughably simple yet soberingly effective scientific experiment which the antagonized or oppressed are known for, Ruskin conducted experiments using treacle and pie to mock the scientific method, and Tyndall's use of wax and bismuth, to effectively and conclusively prove his point.

Ruskin, as mentioned earlier, was also a geologist, though he took as his scientific mentors the older naturalists and contented himself with short hikes with a guide, during which he collected rocks and crystals, ferns and flowers. His eye was keen and sensuous, his emotional response essentially contemplative, his point of 'contact' the skilled hand reproducing images in the sketchbook. But for Tyndall the discipline was athletic. It may be fanciful to see his kind of science as essentially assaultive—a kind of combative questioning or loving conquest by measurement of the great primary forces.<sup>748</sup> In short, then, the scientists were as different in their views as they were in their methods. To use Hadot's paradigm in *The Veil of Isis*, some like Ruskin or Pupin, were more Orphic, seeing science as a poetic gift; others were more like Prometheus, invasively prodding nature for desired and timely results. Tyndall's love of alpinism has been defined as "assaultive": his

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<sup>745</sup> Pupin, *Immigrant*, 208.

<sup>746</sup> Also see Sawyer, "Ruskin and Tyndall," 227.

<sup>747</sup> *Ibid.*, 220.

<sup>748</sup> *Ibid.*, 227.

zest for physical excitement often blended with his investigations.<sup>749</sup> His risks and naïve vanity angered some.<sup>750</sup> To read Tyndall's *Glaciers*, incidentally dedicated to Faraday, which provided some with the claim that none of his labours were purely disinterested, one is struck by the tone of the travelogue with some poetic but mostly dry descriptions of the mountains, and anecdotes with no depth. *Mountaineering in 1861* is aided in its literary quality through the literary epigrams that open each chapter. Pupin's popular scientific writing, by contrast, wove excerpts from literature within the prose, as a seamless whole; in fact, the literary, i.e. poetic, is presented as the primary terministic screen (to borrow from Burke, whose theory we examined earlier) through which he viewed science, as presented through the star metaphor. When Pupin went to the mountains, which he arguably did not, like Tyndall, visit also to study, he took from them moral and philosophical lessons, such as that of humility, explaining that the greatness of the mountains reminded him of a cultural point: while he got past his experience as greenhorn in America, he was now a greenhorn in America, becoming more respectful of the "old ways" of Europe<sup>751</sup> (we know that mountains are old).

Ruskin's Alpine experience and records are more similar to Pupin's than Tyndall's. He went to the Alps to look at them and describe them, "only to look at them, and describe them as they were, loving them heartily—loving them".<sup>752</sup> Ruskin claims in the *Deucalion* that science must have a social and spiritual value, manifest through faith, honour, and rectitude, not unlike the ideals espoused by the National Research Council in the conclusion to Pupin's autobiography<sup>753</sup>—and it is the deeper understanding of things seen that separates Ruskin's writing from Tyndall's.<sup>754</sup> The deeper understanding of things seen is also manifest through how one is to see 'science,' illustrated by Ruskin's description of ice crystals: "And it is all done with 'prismes hexagonales reguliers'! Done, and sufficiently explained, in Professor Tyndall's imagination, by the poetical conception of 'six poles' for every hexagon of ice. Perhaps! If one knew first what a pole was, itself and how many,

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<sup>749</sup> Sawyer, "Ruskin and Tyndall," 227.

<sup>750</sup> *Ibid.*, 228.

<sup>751</sup> Pupin, *Immigrant*, 149.

<sup>752</sup> John Ruskin, *Modern Painters V* (New York: Wiley & Halsted, 1858), 384, accessed October 8, 2012, <http://archive.org/stream/modernpainters04ruskgoog#page/n8/mode/2up>.

<sup>753</sup> Pupin, *Immigrant*, 376-8.

<sup>754</sup> John Ruskin, *Deucalion* (New York: John, Wiley & Sons, 1886), 42-3, accessed October 8, 2012, <http://archive.org/stream/deucalioncollect02ruskrich#page/n9/mode/2up>.

attractive or repulsive, to the east and to the west ... one might institute in imaginative science at one's pleasure ... in the meantime, we will return to the safer guidance of primal mythology."<sup>755</sup>

Ruskin proceeds to examine a depiction of lightning on a Greek coin, which, in his characteristic literary bravado, he explains in terms of art, the science of lightning, and allegory: "We know, to this day, little more of the great functions of this disturbed fire than [the ancient Greek] ... while we subdue or pervert it to our vulgar uses, we are ... dependent ... on the aid of its everlasting force. If less than this was implied by the Olympian art of olden time, we have at least, since, learned enough to read, for ourselves his symbol, into the higher faith, that, in the hand of the Father of heaven, the lightning that is not for destruction only; but glows, with a deeper strength ... to purify, to direct, and to save."<sup>756</sup>

Such attention is given to Ruskin by way of contrast: his writing is more robust than Tyndall's though more similar to Pupin's in terms of its integrating classical motifs. It was nonetheless Tyndall that helped Pupin see the poetry in science<sup>757</sup> even if the prose to the eyes of today's reader may be wanting in terms of literary flair. Where Tyndall writes that he, "loved the freedom of the mountains,"<sup>758</sup> we may use our own imagination to fill the blanks in that picture: "Above the shining sea rose the solemn mountains, overarched by the star-gemmed sky. Here your young imaginations must aid me, for my pen fails to pursue any further the description of the scene."<sup>759</sup> Ruskin's mountains on the other hand are connected to Hermes, the mercantilism and cloud-sense of wool, faces of friends, a childhood poem, and a metaphor for social walls.<sup>760</sup> And that is just the beginning.

In summary, their difference seems to be one of sensibility, perhaps one could even say of a classical appreciation of beauty, particularly if one considers the Greek pedagogical concepts of *paideia* and *kalos kagathos*, in which virtue and beauty were paramount. Pupin was schooled in these values, by Bilharz,<sup>761</sup> at the very time he began to

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<sup>755</sup> Ruskin, *Deucalion*, 75-6.

<sup>756</sup> *Ibid.*, 77.

<sup>757</sup> Pupin, *Immigrant*, 102.

<sup>758</sup> Tyndall, *New Fragments*, 224.

<sup>759</sup> Tyndall, *Life in the Alps*, 321.

<sup>760</sup> Ruskin, *Queen*, 38-41, 148, 150, and 158 respectively.

<sup>761</sup> Pupin, *Immigrant*, e.g. 89-90.

discover the poetry in science. Moreover, Ruskin's beauty resided not in the superficialities of colour, but the essence of being, which includes measure, a principle Ruskin addresses in his rebuke to Tyndall,<sup>762</sup> not to mention discernment.<sup>763</sup> His understanding of these principles mirror Arnold's understanding of beauty.<sup>764</sup> And Arnold pointed out, through the very illustration of a scientist, that modern life has allowed gaping incongruity and disharmony within the human soul.<sup>765</sup> Pupin, as we have seen, was not one such scientist, consciously aware of the need to defend science against such claims, promoting instead the ideals of science, which complied with the ideals of classicism.<sup>766</sup>

Thence the various interpretations of *levavi oculos*—I lift up my eyes to the hills. That the symbolic element of the mountain seems to have been stripped away by science is our loss. As classical scholar Mary Beard put it, “if we were to amputate the classics from the modern world ... it would mean bleeding wounds in the body of Western culture—and a dark future of misunderstanding.”<sup>767</sup> Pupin forged a modern path that linked science with the classical through poetry.

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<sup>762</sup> Pupin, *Immigrant*, 135, “Modest is ... the virtue of modes or limits.”

<sup>763</sup> Ibid., 71, “I have gathered for you ... only instances of what is beautiful in Greek religion but even in its best time there were deep corruptions in other phases of it ... all originating in a misunderstood worship of the principle of life.”

<sup>764</sup> Arnold, *Culture*, 114, “Many things are not seen in their true nature ... unless they are seen as beautiful ... To think that when one produces ... what is mean or vulgar or hideous, one can be permitted to plead that one has that within which passes show ... And to be, like our honoured and justly honoured Faraday, a great national philosopher with one side of his being and a Sandemanian with the other, would to Archimedes have been impossible.”

<sup>765</sup> See fn. above.

<sup>766</sup> Pupin formulated various defenses of science against the accusations of its being a form of materialist reductionism, e.g., Pupin, *Immigrant*, 102, 313, 314, 320. For their compliance, to not repeat examples already given, see e.g., 90-91, his wish to bridge Bilharz's view that the idealisms of ancient Greece with what Bilharz saw as the materialism of modern America, 90-91, resolved at 102: it is no accident that Pupin found this bridge in the metaphorical birth ground of poetry, arguing that in its abstract side, science was not only poetry, but, correspondent to the classical ‘good life,’ “a food which nourishes not only the material but also the spiritual body of man”, 102. This complies with classicism in the sense that even in the average Platonic Socratic dialogue, science was advanced but used for the spiritual benefit of man, most obviously in the *Timaeus* that explores the nature of the physical world but also the nature of the good, or, the *Meno*, which is about mathematics, replete with descriptions of mathematical diagrams, but also the importance of inquiry to becoming a better and braver person. Plato. *Meno*, trans. W.R.M. Lamb (Cambridge: Harvard University Press, 1967), accessed August 27, 2012, <http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0178%3Atext%3DMeno%3Apage%3D86> (86).

<sup>767</sup> Mary Beard, “Do the Classics Have a Future?” *The New York Review of Books*, January 12, 2012, accessed January 12, 2012, <http://www.nybooks.com/articles/archives/2012/jan/12/do-classics-have-future/?pagination=false>.



### 4.3. Pupin's take on the materialist quandary

Tyndall was at odds with some of his contemporaries, as we have seen, both in terms of his ambiguous stand on the nature of the universe and in terms of his restricted but aspiring literary style, which necessarily also revealed his stand towards the classics. Here, we shall consider his stand on the universe and how his understanding of 'chaos' differs from Pupin's.

In Pupin's theory of "creative coordination," he adopts the atomistic notion of chaotic atoms, only to subsume it within a larger scheme of overall harmony, the "cosmos," which the gods had transformed from chaos in the beginning of the ancient Greek universe. Pupin explains Tyndall's definition of heat as chaos, but goes on to say that through creative coordination, the manageable notion of machinery out of the unmanageable notion of molecular chemistry imitates a process of the gods (in a kind of mimesis).<sup>768</sup>

This could be considered an extension of Ruskin's reading of Tyndall's account of heat, which he addressed in *The Ethics of Dust*, where children learn that "Professor Tyndall" has defined life as heat, a mere mode of motion.<sup>769</sup> It is significant that Tyndall also published a work with "dust" in the title: *On Dust and Disease*.<sup>770</sup> Ruskin considers that many scientists ought to be restricted in their "speculation"—as they were from devotion—for they were restricting themselves in their exclusive concern for those things of the unseen for which they could furnish evidence. By "speculation" Ruskin was referring to the endeavours to discover the age of the earth or the complex research that paid no heed to public enlightenment, making the pursuit of science an elite, hazardous, and ecologically tenuous endeavour, "no longer available in the mountain village medicine cabinet but replaced by chapmen, who destroy the rarest living flowers of the Alps to raise the price of their herbaria, and pedestrian athletes in the pay of foolish youths."<sup>771</sup> But it is not only the monetary trade of science that Ruskin disagrees with, but also the capricious market of ideas: "The compliers of popular treatises have sought always to make them more salable

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<sup>768</sup> Pupin, "Commencement Speech, Rochester."

<sup>769</sup> John Ruskin, *The Ethics of the Dust* (New York: John, Wiley & Sons, 1915), 56, accessed October 8, 2012, [http://archive.org/stream/ethicsdusttenle01ruskgoog/ethicsdusttenle01ruskgoog\\_djvu.txt](http://archive.org/stream/ethicsdusttenle01ruskgoog/ethicsdusttenle01ruskgoog_djvu.txt). The reference is to Tyndall's popular exposition of conservation of energy, called *Heat, a Mode of Motion*.

<sup>770</sup> In Tyndall, *New Fragments I and II*.

<sup>771</sup> Ruskin, *Deucalion*, 55.

by bringing them up to the level of last month's scientific news; seizing also invariably, of such new matter, that which was either in itself most singular, or in its contradictory of former suppositions and credences."<sup>772</sup> Ruskin emphasized the transitory, sensationalist nature of scientific discovery, which works against the construction of a framework of understanding, a criticism not unlike Maxwell's "Belfast Address." Pupin did not advocate this kind of science, but argued for the ultimate harmony of ideas in "creative coordination." A precedent might also be drawn to Whewell, who saw both scientific and moral ideas to be shaped by Fundamental Ideas; part of their understanding is reached through intuition—just like Pupin claims to have understood something about the nature of sound by listening to the ground as a cowherder. The idea that more can be divined if a conscious bid is made for divine, i.e. heavenly, help also appears in classical literature.<sup>773</sup>

Pupin's "creative coordination" is the process which "guides evolution of heavenly stars from the cradle to the grave". In this context, chaos is a "joyful message" guiding matter and its activities to "higher levels of creation, transforming the omnipresent chaos into a chaos of order and beauty".<sup>774</sup> The broadest aspect of the life of man: "is coordination, which eliminates the chaos from the activities of its countless molecules of life, and constructs the cosmos, the presence of which we feel in the internal world of our creative soul, our consciousness; in the *language of science* it might be described as 'the climax of creative coordination'. Its cosmos is probably the ideal cosmos which the *poets of ancient Greece* had in mind when they represented it as the creation of the Olympian gods. No scientist can contemplate the mighty theme, the life of man, without *pausing reverently and recalling Tennyson's* well-known lines, dedicated to a tiny flower plucked from the crannied wall: 'I hold thee here, root and all, in my hand, / Little flower – but if I could understand / What you are, root and all, and all in all, / I should know what God and man is.' ...the creative power of man's consciousness is the highest form of creative coordination, The creative power residing in us is, therefore, the origin of the belief that our

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<sup>772</sup> Ibid., 55-6.

<sup>773</sup> Gadamer, *Beginning*, 101. We are reminded that Gadamer writes that the truth is single and opinions are multiple, hence the need of the introduction to the goddess who helps man navigate towards the truth. Even then, "This is the mystery of the openness granted to the human being, the openness for what is possible, the idea that mortals can never simply know one truth but will only find multiple possibilities instead." Ibid 99-100.

<sup>774</sup> Pupin, "Commencement Speech, Rochester."

creative soul is part of Him who endowed the electrons and protons, the atoms and molecules, and the tiniest units of living matter with those primordial attributes which manifest themselves in the cosmic processes called in this *narrative* creative coordination.”<sup>775</sup>

The purpose of that passage is to demonstrate two things. Firstly, that in responding to atomism, Pupin selected those elements of it which were compatible with his own symbolic system. While there are places where their terminology or sometimes even illustrations overlap,<sup>776</sup> nowhere does Pupin write as blatantly as does Tyndall that *matter* is “the universal mother”, nor does he make a case for atomism, ending with the concession—or confession?—“that each succeeding age must be held free to fashion the Mystery in accordance with its own needs”. In some ways, this statement illustrates that it is not so much the prescription for a way of being but the *weltgeschichte* that must be written anew by each generation.<sup>777</sup> This is reflected in the Greek epigram in Ruskin’s *Deucalion*, which is the work in which Ruskin takes an antagonistic stand to Tyndall, and a particularly harsh stand towards impure scientific practice. The epigram is a reference to the Iliad (I.156-7): *since between us are great spaces, both shady mountain and roaring sea*. The context implies a notion of justice in war and the impending result, through Athena’s promise, that the man who is wrong will indeed wrong himself. Such reference to classical paradigms cannot be called stale for they are being applied to historically new contexts.<sup>778</sup>

Pupin is closer to classical thought, while some of his rhetoric is a variation of that used by Tyndall and other atomist evolutionists including: the importance of making an effort (though Pupin’s views are not the same as pelegianism by which it is believed each man can reach salvation through his own efforts); the claim that man’s ascent was divinely ordained (though Pupin’s ultimately differs from Robert Chamber’s evolutionary claim); the claims that problems can be solved through empiricism and science (though Pupin did

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<sup>775</sup> Pupin, *The New Reformation: From Physical to Spiritual Realities* (New York: Cosmo Classics, 2005), 241-3. Emphasis added.

<sup>776</sup> Tyndall said, “The whole process of evolution is the manifestation of a Power *absolutely inscrutable* to the intellect of man” in his “Belfast Address.” Pupin saw God in all things, as in development, but did not think that God was “absolutely” inscrutable.

<sup>777</sup> Viz. Gadamer, *Beginning*, 46, with the warning that “this truth cannot be applied so easily to the philosophical tradition”. This is relevant because the polymath scientists of the Victorian age, like Maxwell, were as well-versed in metaphysics as they were in natural philosophy.

<sup>778</sup> In this way, the argument that classical studies are no longer relevant to humanity merely illustrates the poverty of contemporary culture, and how deep philistinism can run.

not say that this was true in all aspects of life, rather that through science, man could become closer to God); and the addressing of differences between atomic evolutionism and a universal.

Pupin *seems* to respond both to pelegianism and man's ability to master the terrestrial. But while he writes the inventor planted the seed of hope in the soul of men that some day *he* would work out his salvation from the borders of Adam's original sin, that the steam engine is a crude copy of the cosmic engine, such machine origin is a "*gift from heaven* to reward man for diligent study of the language of nature".<sup>779</sup> Lest one think the "gift from heaven" refers to Tyndall's "universal mother", matter, we are wont to remember that he also wrote that "the greatest prophets of science" contributed to "the welfare of mankind and to man's understanding of the glory of God".<sup>780</sup> He wrote, too, "has our civilization reached its lofty aim to raise the life of man to Olympian heights in conquest of space, yes, but not his spiritual side" which was far from edifying, given war, economic wealth in the face of starvation, and so forth.<sup>781</sup> In his system of "creative coordination" which transforms chaos into order and beauty, "to guide this complex life from a threatening chaos to a society became the highest point of a man's creative soul. The church and the state are most important among social coordinators, though are physical structures only; but behind them is divine breath which is the power of creative coordination."<sup>782</sup>

And while it was up to man, through ideals of character and achievement, to learn to interpret the language of God, Pupin didn't exaggerate man's place in the larger scheme of things: the moving power of heat and electricity is the immortal element in the structure of civilization in which the machines created by men are transient. Mankind has yet to yield to the greatest moving power in the spiritual world and without it, "the moving powers of heat and electricity cannot contribute their full share to the evolution of the spiritual life of man".<sup>783</sup> In other words, "Banish the demons from the human heart and there will be no need of vast armies ... Another moving power is sorely needed which can penetrate more

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<sup>779</sup> Pupin, "Message from Science," also, "Communication Dinner."

<sup>780</sup> Pupin, "Columbia and Idealism in Science" (Speech delivered at 175<sup>th</sup> Dinner, October 30), C.U. Rare Books, M.S. 1035

<sup>781</sup> Pupin, "Fritz."

<sup>782</sup> Pupin, "Commencement Speech, Rochester."

<sup>783</sup> Ibid.

deeply than the moving power of even the infinitely minute electrons into the depth of the human heart”<sup>784</sup>

Lest it seem that Pupin was more distant than close to the narrative of his day, he also writes, “In every creative physicist there is hidden a metaphysicist and a poet; but the physicist is less apt to persist in his occasional errors as a metaphysicist and a poet, because the creations of his speculative mind and of his poetical vision can be subjected to crucial experimental texts.”<sup>785</sup> This can be compared to Giambattista Vico’s description of the Godly university education, wherein geometry checks innate errors, and physics awakens one from dumb awe of the marvels of nature.<sup>786</sup> It is also similar to Faraday’s view that he could have believed the *Arabian Nights* as a child, “but facts were important to me and saved me”<sup>787</sup> and similar to Plato’s Socrates saying that he would resort to the language of a geometer to avoid prolixity in proposing a measure of understanding not subjected to the corporeal.<sup>788</sup> For Plato, like Ruskin, Vico, Whewell, and Pupin, presents an argument for an elenctic method that is at once guided by fundamental ideas or ideals. Pupin imputes the characteristics of such an elenctic metaphysical poet to Tyndall, writing that, at least according to his understanding while he was in Germany, the “eternal truth” was “the sacred background of Tyndall’s scientific faith, and the works of the great scientific discoverers, their lives, and their methods of inquiry into physical phenomena were the

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<sup>784</sup> Pupin, Fritz, “This need was recognized nearly 2000 years ago when our Saviour revealed the greatest moving power in the spiritual world and commanded us to love the Lord our God and to love our neighbours as ourselves.”

<sup>785</sup> Pupin, *Immigrant*, 222.

<sup>786</sup> Giambattista Vico, “On the Heroic Mind,” translated by Elizabeth Sewell and Anthony C. Sirignano, accessed June 7, 2012. <http://www.shkaminski.com/Classes/Readings/heromind.htm>. “Thus metaphysics will free the intellect from the prison of the senses; logic will free the reasoning power from false opinions; ethics the will from corrupt desires. Rhetoric exists to ensure that the tongue does not betray nor fail the mind, nor the mind its theme; poetics to calm the uncontrolled turbulence of the imagination; geometry to hold in check innate errors; physics, in truth, to rouse you from the blank amazement with which nature and her marvels has transfixed you.”

<sup>787</sup> Tyndall, *Faraday*. Though this also highlights the problem of taking myths literally.

<sup>788</sup> Plato, *Gorgias*, translated by W.R.M. Lamb (Cambridge: Harvard University Press, 1967), accessed January 18, 2012, <http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0178%3Atext%3DGorg.%3Apage%3D465>. It is noted that Socrates uses this language in a discussion demonstrating that a form of ‘pastry baking/delicatessen’ discourse (ὀψοποιική from ὄψον), in this translation rendered as ‘cooking,’ is in fact “flattery disguised as medicine” and not good for man.

only sources from which the human mind can draw the light which will illuminate that sacred background.”<sup>789</sup>

The comparisons between Pupin and Tyndall will be explored in more detail to further elaborate the context of Pupin’s views, emphasizing once again that Tyndall was Pupin’s mentor. Pupin admired Tyndall’s challenge to Tocqueville’s attack on American materialism, in which he praised American “original investigators”; Pupin praised Tyndall’s “eloquence”, and promotion of scientific research in American universities.<sup>790</sup> But the system of beliefs from which they acted were quite different: Tyndall’s pantheism seems to fill the void left by Kant in his criticism of metaphysical materialism, making of it a methodology, not a general philosophy.<sup>791</sup> There were times when Tyndall sounds like a theist, but may have nonetheless been a glorified epicurean: for example, he wrote that “matter and law are so to speak the substratum on which a Deity inscribes himself”.<sup>792</sup> There are different shades to Tyndall, this seems the only conclusive statement to make. To a friend who thought that peace and blessedness lay in ‘equilibrium,’ Tyndall replied that life consists in the passage toward equilibrium: “The passage often involves a fight. Every natural growth is more or less of a struggle with other growths, in which the fittest survive. In times of strife and commotion we may long for peace; but knowledge and progress are the fruits of action.”<sup>793</sup>

In contrast to this, Pupin, as we have seen, writes of “the gifts of God” that come to the man who makes an effort: that it is a gift changes the context of “action”. Tyndall’s world seems a struggle; Pupin’s, a bountiful exploration of a beautiful, merciful world made by a loving God. And this, of course, is compatible with the classical view of ideals and the universe.

Insofar as Pupin combines classical narratives with other influences, like a touch of Chambers’ evolutionary promise for man, he does so for allegorical purposes. It is thus he insists, by shifting the emphasis from atomism, that, “Nothing in the genesis of the power age reveals the slightest trace of sordid materialism”. Man’s inventions are but “crude imitations of power operations that have been at work in the organic world ever since solar

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<sup>789</sup> Pupin, *Immigrant*, 209.

<sup>790</sup> *Ibid.*, 204-5.

<sup>791</sup> See Barton, “John Tyndall.”

<sup>792</sup> *Ibid.*, 128.

<sup>793</sup> Sawyer, “Ruskin and Tyndall,” 228.

radiation,” he writes. Pupin then turns the argument on its head, showing his control of rhetoric, asking that if physical science and engineering are not responsible for materialism, what is. “An utter lack of understanding of the meaning of this material structure is responsible for the belief that it hides the source of modern materialism.” The most tangible rewards of engineers’ search “for morsels of truth in the physical world” are the “discoveries of the laws which govern the action of physical powers and of the means of harnessing these powers in the service of mankind. Every machine is such a harness, it is a visible record of some new morsel of universal truth”.

The source of modern materialism that makes physics, science, and engineering appear as materialistic endeavors has its depth in the vices of the human soul, which threaten the fruits of virtue. In Pupin’s words, the source of modern materialism: “is much deeper than the deepest foundation of any material structure raised by the genius of man. It is in deepest depths of the human soul where selfishness and greed, hatred and fear, have invaded the very habitation which the soul of man had reserved for the nursery of its celestial twins: beauty and goodness ... which are revealed in the world of Raphael, Milton, Beethoven ... the spiritual world is outside the boundaries of physical world – and the powers discovered and harnessed by scientists have no control over the spiritual world. The highest mission in the civilized world is to train spiritual leaders to deliver the soul of man from the demons of materialism...”<sup>794</sup>

The first idea is much like Arnold’s observation that it is not perverse but “too natural” that aristocracy is lured by worldly splendor, security, power, and pleasure, which he calls the “eternal seducers”.<sup>795</sup> Such moral consideration falls within the Greek pedagogical concepts of *paedeia* and *kalos kagathos*, both of which, as we have seen, form the foundation of the classical education, though it is worth noting that not all 18<sup>th</sup> century thinkers understood them as such, as seen in Maxwell’s criticism of Edward O. Wilson’s reading of Aristotle in *Moral Philosophy as Applied Science*. Maxwell writes that Wilson considers Aristotle’s golden mean as a “pocket rule to find virtue, which it is not meant to be, but an apophthegm or maxim, or dark saying, signifying that as a hill falls away on both sides of the top, so a virtue at its maximum declines by excess or defect (not of virtue but)

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<sup>794</sup> All quotes in this paragraph taken from Pupin, “Message from Science.”

<sup>795</sup> Arnold, *Culture*, 63.

of some visible quantity at the disposal of will.”<sup>796</sup> As the golden mean is the cornerstone of *paeidea*, this illustration shows the extent to which that edifice was already crumbling in the 18<sup>th</sup> century, though was arguably still visible.

#### 4.4. Pupin’s literary system

Where the classical system was a total one, combining science with values, it was also centered on language, the means through which those ideas were conveyed. This is true, for example, of the science in Plato that was at once ethical and metaphysical, but was also part of Pupin’s literary system, which emerged in part as a response to the criticism of his classics teacher Bilharz that science was materialistic: at that time, coincidental to his first more serious scientific reading, that he formulated his poetic views of science. With the importance of poetry and language in scientific discourse, the science remains connected to the humanities, not surgically removed. It is interesting to consider that in more modern times, science was rid of its (popular, explanatory) linguistic component through language itself. As the connection has been lost, “Histories of higher education often overlook the uses which the advocates of science made of the classical course in which they had been baptized.”<sup>797</sup> So when in 1883, there was a contest between letters—with their traditional connection to larger traditions of thought, like for example ontology—and science, science won out, through new pious platitudes of an atomistic nature, where the mind as microsm’s access to an understanding of the universe as macrocosm, and the beginnings of this universe, was rejected together with the framework of there being fundamental ideas in the universe. The mind, it was argued, became microscopic instead of comprehensive.<sup>798</sup> Pupin’s literary system was comprehensive, assuming the existence of fundamental ideas, expressed as “the language of God” and “immutable foundation of the universe,”<sup>799</sup> which

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<sup>796</sup> Campbell, *Maxwell*, 74.

<sup>797</sup> Sherman Barnes, “The Entry of Science and History in the College Curriculum 1865-1914,” in *History of Education Quarterly* 4, no. 1 (March 1964): 44-58, accessed October 8, 2012, <http://www.jstor.org/stable/367256>.

<sup>798</sup> Ibid. Barnes also writes, “The antagonism of science and religion, of belief and belief, is due to a want of comprehension.”

<sup>799</sup> Pupin, *Immigrant*, 76 and 383. From the latter: “We feel intuitively that science will never penetrate the mysteries beyond it, but our faith encourages us in the belief that there behind the impenetrable veil of this eternal background is the throne of a divine power, the soul of the physical world, the activity of which



he outlines through his stellar metaphors that form a central motif of his autobiography. The three are inseparable, “From the point of view of science, religion and the fine arts, as expressions of intellect, spiritual, and aesthetic coordination of the creative power of the human soul, are three inseparable parts of a single science, the science of creative coordination.”<sup>800</sup> He asks whether the “language” of science can “describe” the creative process “which brings this internal world into existence without employing the language of speculative philosophy”.<sup>801</sup> In this way, his narrative structure is similar to Whewell’s, giving some primacy to science yet seeing it within a “creative” whole.

In Pupin’s symbolic system, as we have seen, there was a place for everything—even witty reference to his values. In one anecdote, he explained it was no miracle to invent the radio; the real miracle worker is He who created the finger.<sup>802</sup> The simple anecdote reveals how deeply comprehensive Pupin’s cosmological-scientific views were. In his autobiography, his classical-religious-poetic world view is woven into his views of science. We may surmise that because he wrote a literary work, and one on his own terms at that, unlike the pious Maxwell, whose *Life* was composed by Campbell, he did not subscribe to Maxwell’s view when the latter wrote: “the results which each man arrives at in his attempts to harmonise his science with his Christianity ought not to be regarded as having any significance except to the man himself and to him only for a time, and should not receive the stamp of a society.”<sup>803</sup> But Maxwell wrote that to politely decline membership to the Victoria Institute and Pupin was not representing any particular institution in his autobiography. Furthermore, he was acting from the context of the preacher Henry Ward Beecher, whose sister was authoress Harriet Beecher Stowe.<sup>804</sup> It was appropriate in some influential circles to publicly declare a symbolic system with God at the top. Pupin, after all, observed people from many other denominations among Beecher’s pews, who came for

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we contemplate in our research of physical phenomena.” Also, the language of the earth that is to be learned by man is mentioned throughout Pupin’s other book, *Romance*.

<sup>800</sup> Pupin, “Creative Coordination.”

<sup>801</sup> Pupin, “The Pioneering Professors,” *Scribner’s* 75, no. 2, June 1928, accessed August 6, 2012, <http://www.unz.org/Pub/Scribners-1929feb-00123>.

<sup>802</sup> Velimirović.

<sup>803</sup> Campbell, *Maxwell*, 196.

<sup>804</sup> It was through knowledge of Beecher’s sister that he understood who Beecher was. A romantic account of how he came to Beecher’s congregation, and the effect it had on him, can be found in Pupin, *Immigrant*, 105-8.

the quality of the words he spoke. Even the cynical Bilharz recognized his talent.<sup>805</sup> So, here, we are seeking to place Pupin in a classical and rhetorical context that is at once Christian, though one that advocates science. In this respect, he is perhaps most similar to Whewell, who is as known for his metaphysical treatise as for his science; it is notable that although Whewell's work is sometimes misunderstood, his metaphysics arguably in no way obstructs his theory of science, which nonetheless relies on a process of explication of conceptions and observation, requiring the correct application of fundamental thought or conception to observed phenomenon ("colligation") if a new discovery is to be made. This is important to mention because there are critics who argue that a bias towards Ideas originating from the mind of a Creator (the fundamental ideas) obstructs the science.<sup>806</sup> We understand that such detractors were not as vociferous during Pupin's time, because he could still draw on certain intellectual or popular milieus, like Beecher's, as part of his rhetorical ethos.

When writing of the higher endeavours that would prepare man for spiritual leadership of the world, he explains that the mission was being accomplished in terms of mechanisms invented to benefit the public: at universities, labs were being created; in the fine arts, museums and private collections were established. Yet without religion, the cultivation of such noble aspects of human life would not give the results expected from the highest ideal of human life.<sup>807</sup> It was around this time that all the great philanthropists in New York presented the city with legacies such as the New York Public Library (1911) and the wings of the MET (1910). Pupin stresses that Americans should appreciate this legacy by explaining that spiritual leadership that "guided Washington".<sup>808</sup> When he writes at the end of his autobiography that the disciplined men of training will make democracy safe for the world and explains that science brings us closer to divinity,<sup>809</sup> from the context of the

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<sup>805</sup> Pupin, *Immigrant*, 106.

<sup>806</sup> See Snyder, *Philosophical*, and Laura J. Snyder, "William Whewell", *Stanford Encyclopedia of Philosophy*, accessed December 12, 2012, <http://plato.stanford.edu/entries/whewell/>. Snyder demonstrates in the latter entry how Whewell is most often misunderstood due to a change in the definition of the word "conjectures" and outlines his differences from Kant and the relation of his ideas to Mill and Bacon.

<sup>807</sup> Barnes, "Entry," it was considered that the final value of physical science was, "its capability to foster in us noble ideas, and to lead us to new and larger views of moral and spiritual truths." To this end, laboratories were considered good for ethics: requiring truthful statement, self-control, and industry, *ibid*.

<sup>808</sup> Pupin, "Our Industrialism and Idealism," *Scribner's* 83, no. 6, June 1928. Accessed August 6, 2012. <http://www.unz.org/Pub/Scribners-1928jun>, 664.

<sup>809</sup> Pupin, *Immigrant*, 383.

book, it is clear this “divinity” is the same as that in the Psalms and in the village church where his mother prayed. This is because he connects them to the “immutable laws” that earlier in the book were connected to the laws or the language of God, expressed, for example, in the language of the stars.<sup>810</sup> This confluence of metaphysics, science, and poetry (viz. the language of God that is also the poetry of science) is developed throughout the autobiography, to the very last pages.

We shall try to elaborate this idea through further examples. Pupin’s symbolic system is ultimately linguistic, not only does he write of the “language of science”, but also of “Tyndall’s poetic story”<sup>811</sup>, which he subsumes to a “narrative creative coordination”. By contrast, where Tyndall wrote that the sun and stars are pages in a book written by God,<sup>812</sup> this linguistic scheme was not developed consistently throughout his writing and was ambiguous. In this way, parallels can be drawn between Pupin’s scientific-literary system and Eliot’s in *Middlemarch*: it could be said that his autobiography answers her wish to keep the mystical alive, and yet he also answers the question of how ‘fictional’ science is: science is a fiction as much as mimesis is fiction. An example of this from his broader extrapolation of these ideas is Pupin’s comment that, “a time will come when recognize flame is of heavenly origin. Some day a Homer in science will dedicate an epic to the wanderings of the exiled carbon atoms [involving the journey from photosynthesis to the power plant] just as Homer of old dedicated his immortal epic to the wanderings of Ulysses.”<sup>813</sup> Another example is his references to his autobiography as “my story”<sup>814</sup> and perhaps most significantly, his description of creative coordination, which is essentially—as we have seen—the apex of his narrative, as a story.<sup>815</sup>

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<sup>810</sup> See Pupin, *Immigrant*, 338: “To discover the immutable laws which this substantia, this immutable foundation of the universe, obeys is the highest aim of scientific research. The existence of these eternally unchangeable things brings us face to face with a power which is the eternally immovable background of all physical phenomena.” This is because sound and light are the language of God, 76, and knowing the language of stars is a way to become closer to God, 244-5. Finally, we see that the language of God is expressed in laws in this excerpt: “the laws which the stars and the planets obey and have always obeyed in their paths through the heavens are unchangeable; they never grow old, and therefore they are immortal; they are a part of the eternal truth.” 220.

<sup>811</sup> Pupin, *New Reformation*, 228.

<sup>812</sup> Qtd. in Barton, “John Tyndall,” 127.

<sup>813</sup> Pupin, “A Message from Science.”

<sup>814</sup> Pupin, *Immigrant*, 2, 19, 116, 126, 130, 132, 160, 199, 321, 342.

<sup>815</sup> *Ibid.*, 385-6.

Mimesis is not fiction: the question is not one of fiction vs. non-fiction, but true representations vs. false, or poor ones, as we have seen. This can be illustrated by Ruskin's view on the classical tradition: that it contains deep corruptions even at its best, and at its worst, degenerates its deities to the extent that worship of the principle of life becomes confused, resulting in corrupted forms of devotion. Knowing this, he extracts from it instances of the beautiful.<sup>816</sup> Pupin arguably presents the beautiful in science within a total world picture. It is worth noting that his first conception of science as poetry is explicitly developed in part as a defense against the classicist Bilharz's argument that America was too materialistic; he claims, too, that the first story he ever composed was one about Bilharz, the "Greek guslar" who sought "consolation in the poetry of Rome and Greece".<sup>817</sup> An argument can be made that to some extent Pupin was inspired by the selective spirit of the classical curmudgeon, seeking at all times the beautiful.

What Pupin had, and what many scientists today lack, is a foundation in literature, including the classics. He valued his Columbia training in this respect, saying that the higher efforts of Franklin and Lincoln, neither of whom went to college, reminded him that his humanities studies at college "did not necessarily have a direct connection with my future activities, by which I expected to make a living. They were cultural studies preparing the student for a life worth living."<sup>818</sup> In line with the classical goals of education in terms of the good life, he remarked that, "The development of character is the higher aim of college education".<sup>819</sup> He also wrote that "thanks to early training at Columbia, I feel that the longer I live, the more attractive life seems to become." He called it a "heavenly gift" to be able to move freely in the world of beauty and goodness, "the so-called spiritual world... This power increases with age if in our early training we have made a proper start".<sup>820</sup> His audience would know that this beauty and goodness is also part of Plato's good life—which has been touched on thus far: how, through humility and mimesis of the heavens, one can reach beauty and enjoy life.

While the illustrations Pupin used to describe the world are similar to those used by Hunt in *The Poetry of Science*, the emphasis in Pupin's writing is different. Hunt writes,

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<sup>816</sup> Ruskin, *Queen*, 71.

<sup>817</sup> Pupin, *Immigrant*, 140-1.

<sup>818</sup> Pupin, "Hotchkins."

<sup>819</sup> Ibid.

<sup>820</sup> Pupin, "Class Letter."

“There are indeed ‘tongues in trees;’ but science alone can interpret their mysterious whisper and in this consists its poetry.”<sup>821</sup> He also writes of the Greek insight as a fictitious dream while only modern science reveals reality: “Prometheus stole fire from heaven and gave the sacred gift to man... by the aid of it could temper the severities of climate... and illuminate the hours of darkness. So says the beautiful fiction of the Grecian mind, which appears as a poetic dream or a prophetic glance... Modern science has shown ... the principles described in a sun beam are indeed the exciters of organic life...”<sup>822</sup>

This may be compared to Pupin’s speech in which he explains that the steam engine inventor would be called Prometheus for stealing from the gods, but in his speech the imitation of the processes of nature is not an offense, rather, “these intuitions of the ancient sun worshipper are as of the inventor of the caloric engine have been translated into intelligible language by modern science”. This “creative coordination” is a “joyful message” where man can challenge the creativity of his soul to guide chaos to cosmos, helped by church and state. “The cosmic processes of creative coordination guide the destiny of the external material world and the destiny of the internal world of the human soul.” Pupin’s system is more complex than Hunt’s, which ultimately glorifies science, while Pupin’s praises science but ultimately glorifies a life in which man is reminded that he has a soul. Pupin is perhaps more classical, then, in this respect, in the sense that not only does he borrow myths and poetry, but he also borrows the complexity of thought outlined in the previous chapter, ultimately containing a moral message.

In contemporary times, it is easy to lose sight of the fact that even in medieval times—traces of which can be seen in the classical training of Victorian scholars, education was rooted primarily in the *letters*. It was only after finishing the Trivium (consisting of grammar, logic, and rhetoric; the throne of argument) that one could proceed to subjects like mathematics in the Quadrivium. Science—despite post-Baconian emphasis on empiricism—requires the topics of invention, as understood by Maxwell “words, and their wonderful play” can colligate discovery or outmode the old.

A more ‘dramatic’ aspect of Pupin’s autobiography is his attention to symbolic figures, such as his description of the Serbian peasant still carrying messages by horse even

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<sup>821</sup> Hunt, *Poetry*, xiv.

<sup>822</sup> *Ibid.*, 187.

after his inventions had contributed to upgrading telecommunications. Pupin picks up on the ranging mentalities and realities of the time (such as East European “greenhorns”; the village peasant) of people from various walks of life. This sensibility makes him comparable to Dickens. Bakhtin has made Dickens memorable for his ability to be a “sponge” of his times: to be receptive to the many aspects of the culture of the time. Bakhtin describes this as centrifugal, because it includes an ever-larger sphere of people and interests; to him, Dickens’ narrative is sensitive to the related polyphony, i.e., the many registers and voices of this changing culture.

The changing culture was in part represented in Dickens’ review of Hunt’s *Poetry of Science* where he singled out the “Theory of Development” from Robert Chambers’ *Vestiges*, wherein the ascent of humanity is divinely preordained. The reading public was made receptive to Hunt’s work by Chambers, who “awaken[ed] an interest and a spirit of inquiry in many minds, where these had previously lain dormant”.<sup>823</sup>

Science has the power to rouse the imagination (which is why Pupin says science is not cold), and can fuel stories. While Pupin nowhere wrote that science has “blown to atoms” mythical explanation for natural phenomenon like Dickens did, he might agree that the facts do not imprison the mind, but present equally as imaginative narratives. Such scientific narrative, in Pupin as well as Dickens, stimulates the imagination and enables visions of a ‘better and more beautiful’ future.<sup>824</sup> In this way, they are not unlike Cicero, who criticized the atomists on account of their making no contributions to society or the greater good.

One of the arguments used by those in favor of science to defend it against accusations of its materialism was to appeal to pathos, which Cicero taught was effective in the conclusion of oratory. This appeal to pathos can be seen in Dickens who was one of the most prominent apologists of science in the English language. He arguably set the tone for much further rhetoric. In Dickens’ speech at the Midland Institute in 1869, he dismissed the “material” age, explaining that electricity is no more material because its discovery put it in man’s service. He illustrated the point by saying that it is not a material journey when one

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<sup>823</sup> Dickens, “Review.”

<sup>824</sup> Dickens, Preliminary Word, *Household Words*.

takes the train, heart heavy, to see a dying loved one.<sup>825</sup> Pupin, like Dickens, looks behind phenomena to find meaning. He wrote that science is often wrongly presented as devoid of emotion when really even physical fact has two terminals: one in our own consciousness and the other in a star, rejoicing in the zest of its youth.<sup>826</sup> This may be compared to our understanding of mimesis outlined earlier, where it was defined as the imitation of the *mathematical* star dance of heavenly order.<sup>827</sup> Science, Pupin writes, is the activity of things, not their ultimate nature.<sup>828</sup> The ultimate nature is divine, perhaps never divined.

Yet both Dickens and Pupin had faith in the social promise of science. Pupin's enthusiasm can be seen particularly at the end of his autobiography when he writes: "There certainly is something in the evolutionary progress of the world which favours the view that [we may] ... some day find a way of coordinating the non-coordinated activities ... and thus create an ideal democracy ... Call this progress, or evolution, or anything else you please, it certainly is there."<sup>829</sup> And why wouldn't it be for Pupin after WWI, when he had secured his native Idvor for Serbia, served Serbia, America, and mankind through his ideas and charity, and had important and influential friends who believed in social responsibility. But we have seen from Pupin's other writing that his moments of enthusiasm were generally tempered by a more sobering didacticism. We have also seen his command of rhetoric and the euphoric is a known motivator in delivery.

We may end this section by considering other extracts from the end of his autobiography. He writes how 50 years ago as part of a herdsman's squad he watched the stars, the light of which he felt proclaimed the language of God. He came to unfold the meaning of light through Faraday and Maxwell, among others, and brings not only an end to his book but the stellar metaphor examined earlier. "Fifty years ago, instructed by David's Psalms, I found in the light of the stars a heavenly language which proclaims the glory of God, but I did not know how that language reached me, and I hoped ... I might

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<sup>825</sup> Charles Dickens, "Inaugural Address on the opening of the Winter Session of the Birmingham and Midland Institute" (speech delivered in Birmingham, September 27, 1869), accessed October 8, 2012, <http://ebooks.adelaide.edu.au/d/dickens/charles/d54sls/chapter42.html>.

<sup>826</sup> Pupin, *Immigrant*, 380.

<sup>827</sup> Gadamer, *Relevance*, 36.

<sup>828</sup> *Ibid.*, 281.

<sup>829</sup> *Ibid.*, 385.

find out. That hope was in my soul when I landed at Castle Garden”.<sup>830</sup> Thus Pupin sings the praises of language, in a meta paean to science and to the prizes awaiting the man of humility and hard work. He concludes by reminding readers that the Greeks believed the world started with chaos out of which emerged the cosmos. They were optimistic because order and beauty emerged “out of hideous disaster”. Pessimists project a view of a “most wretched world” but there is scientific evidence to support the world view of the Greeks.<sup>831</sup>

Just as the *Parmenides* is a poem that seeks to imitate the universe, Pupin saw scientists as pioneers making explorations that “read like tales from a new world of physical phenomena, full of poetical visions”.<sup>832</sup> These scientists are also poets and prophets, which enables them to disclose their visions. “Faraday’s new facts and principles revealed by experiment are steeped in the honey of his fancy; they are rich food made delicious by the flavor of his poetical imagination, even when that flavor leaves the ordinary mortal guessing as to its exact meaning.”<sup>833</sup> Contemplation of the beauties of poetic, prophetic questions leads to completion of one of the three “higher endeavours” which together lead man to perfection. Pupin’s literary system points outside itself: to other people, countries, aspects of life—all the while, pointing to beauty, ideals, and ultimately to God.

#### **4.5. Summary of classical virtues: ethics, humility, virtue, universal values**

It has been pointed out that a common thread between Tyndall and Pupin was their belief in the importance of work. While this idea was given a special context through social evolutionists and in connection with progress, it was also an important classical virtue. According to Aristotelian ethics, scientific knowledge is to be conducted in order to seek knowledge for itself, without practical consideration. Similarly, Plato’s contemplative life involves freeing oneself from individual passions, in order to conduct rational study of the world. Ethical choices of value inform the knowledge gained.<sup>834</sup> As for history, it plays a

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<sup>830</sup> Pupin, *Immigrant*, 380-1.

<sup>831</sup> *Ibid.*, 384.

<sup>832</sup> *Ibid.*, 222-3.

<sup>833</sup> *Ibid.*, 223.

<sup>834</sup> This idea corresponds to Burke’s neologism of terministic screens, but also to Hadot’s reading of Monod, who he cites as writing: “To place the postulate of objectivity as the condition of true knowledge constitutes



role not unlike that of rhetoric, according to classical ancient philosophy: its function was to tell good stories that give instruction for the good life: thence Pupin citing his scientist predecessors he sought to emulate, or draws on myth to illustrate scientific principles. History, until recently, was considered *magistra vitae*, the teacher of life, a moral account. For humanists, morality and eloquence were supposed to be revered more than power—just like how Pupin revered business but only insofar as it assisted science in its ideals.<sup>835</sup> The role of mimesis in is to represent reality by selecting aspects of actions that give form to universal truths: with a beginning, middle, and end, and not merely make a copy of reality. Pupin, a classicist in all these respects, did not make a copy of the great chain of being, but invented his own system of creative coordination, which combined all sciences and arts in which each person, like a cell (in line with the classical view that man is a microcosm of the macrocosm), was to be coordinated for the higher good of the whole social body.<sup>836</sup>

The ultimate goal of philosophy was not to speak physics, but to aid man to better understand his place in the cosmos, and teach him about goodness and beauty. It was to show that the cosmos works the way it does because it is good and beautiful, and men are part of it. Knowledge of governing scientific realities were to make better persons, as demonstrated in Plato's *Timaeus Critias*, Ruskin's *Queen of the Air*, or Arnold's *Culture and Anarchy*. We may be reminded at this juncture of Maxwell's fears of what would happen if science would lend more attention to anomalies than that which is universal. Man is not supposed to be the servant to an argument; rather, the argument is to be servant to man, as suggested in Plato's *Thaetetus*. In this way, Whewell writes of guiding ideas, which inform empiricism (bound to be navigated, according to Burke, by terministic screens, anyway).

The workings of the universe are ultimately 'literary' in that they are reflected through language. The classical poetry used to describe the universe was not to convey what happened (only the gods could know that), but what could or should happen. A written work, as the *Timaeus*, may be compared to the universe which is the poem of God.

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an ethical choice, and not a judgment of knowledge, since, according to the postulate itself, there could be no 'true' knowledge prior to this arbitral choice". Hadot, *Isis*, 186.

<sup>835</sup> This idea is most clearly spelled out in his contrast of the university and business when it came to scientific research: Pupin, *Immigrant*, 342 (urging industries to also adopt the idealism of the university), also 358, 359.

<sup>836</sup> *Ibid.*, 384.

If the universe is a poem, the poet can unveil its meaning through the composition of a poem (by participating with, through mimesis). Art, particularly composition, was a crucial mode in understanding nature.

It was thought that man only arrives at what is reasonable or likely (vs. what is “true”), as demonstrated in the *Timaeus*. Despite man’s best efforts to understand, there was an element of doubt (as in the “may” at the end of Pupin’s autobiography). Man’s truth can be but a correction of an error, a “daughter of time”. So the diversion of research can only be like solving a puzzle. As stated before, the purpose of early thought was not to possess knowledge, per se, but to strive towards knowledge. Along these lines, Pupin writes that Copernicus, Kepler, Galileo, Newton sought the hidden cause of the puzzle, and though we are no closer to solving this puzzle, we are painting an ever truer picture.<sup>837</sup> There was a meditative aspect in such study: Cicero, for instance, writes that the search for that which is hidden in nature brings pleasure.<sup>838</sup> Philo of Alexandria uses the word mystery, which he contemplates in nature.

These values found their way to the scientific laboratory, in which the work required good ethics, truthful statement, self-control, and industry.<sup>839</sup> Faraday developed his own series of mental exercises to guide study, honor, argument, imagination, judgment, hope, politeness, friendship, on prematurely forming opinion of others, and so forth.<sup>840</sup> Faraday was a paragon of such ethics, seen in his gracious treatment of Tyndall after the latter delivered a paper that sought to overthrow Faraday’s findings.<sup>841</sup> The depth of Faraday’s work ethic was also reflected in that while he knew his discoveries had a practical side, he steadfastly resisted the seductions of this side, applying himself to the development of principles, if aware that the practical development would receive due development thereafter.<sup>842</sup> He wrote that, the “sweetest reward of my work is the sympathy and good will which it has caused to flow in upon me.” He also lived in penury much of his life, despite all he contributed to science. We remember that Pupin promoted similar

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<sup>837</sup> Pupin, “From Chaos to Cosmos.”

<sup>838</sup> Cicero, “A Treatise on the Chief Good and Evil”, *The Academic Questions, Treatise De Finibus. and Tusculan Disputations Of M. T. Cicero*, trans. C. D. Yonge, accessed February 19, 2012, <http://www.gutenberg.org/files/29247/29247-h/29247-h.html#toc9>, V, 18, 19.

<sup>839</sup> Barnes, “Entry.”

<sup>840</sup> Alice Jenkins, *Michael Faraday’s Mental Exercises*, (Liverpool: Liverpool University Press, 2008).

<sup>841</sup> John Tyndall, *Faraday as Discoverer*.

<sup>842</sup> Ibid.

values; highlighting Tydanll's suggestion that chairs be humble so that full attention be devoted to study.<sup>843</sup>

So for many Victorian scientists and thinkers, moral character was particularly important. Maxwell noted that human fallibility threatened science, writing that "few will grind up these subjects without the help of rules, the awe of authority and a constant abstinence from unripe realities."<sup>844</sup> Similarly, Mumford wrote a warning that only the man who have learned to live (i.e. to get things done in an organized fashion) have the right to make use of technology: "For mark this: only those who live first and who keep alive have earned the right to use the machine. Those who use machinery because they are incapable of facing the stream of life and directing it, those who seek order in automatons because they lack the discipline and courage to achieve order in themselves, become the victims of their instruments and end by becoming mere attachments to a mechanical contrivance."<sup>845</sup>

Whereas the Aristotelian view of ethics in scientific knowledge was to seek knowledge for itself, not with utilitarian consideration, a view also upheld by Helmholtz,<sup>846</sup> in more modern times the engineer has conquered the dignity of a scientist because the art of fabricating has become the prototype of science, implying a new, different kind of knowledge: not contemplation, but practical application.<sup>847</sup>

Ruskin wrote that while practical uses of nature led to the creation of fibres out of the mosses, allowing us to make cheap and fine clothes ("here was paradise indeed!"), this confusion was sure to pass, and men would see that the happiness to be desired from natural science comes not from the material benefits of scientific knowledge, but from renewed appreciation of God. He also saw a discrepancy in the fact that while mankind was losing the art of painting on glass, he had invented guns and nitro-glycerin. He felt certain that future ages would hate this age for its scientific achievements and would ask England how it could be so cruelly indifferent to the application of science to cure famine in India

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<sup>843</sup> Pupin, *Immigrant*, 203.

<sup>844</sup> Campbell, *Maxwell*, 99.

<sup>845</sup> Mumford, *Mumford*, 52.

<sup>846</sup> Hermann von Helmholtz, *Academic Discourses* (Heidelberg, 1862), qtd. in *Science* 55, (1922): 408, writes: "Whoever in the pursuit of science seeks after immediate practical utility may rest assured that he seeks in vain."

<sup>847</sup> Hadot, *Veil*, 122.

and Persia.<sup>848</sup> Mary Shelley asked the related question of whether man should do something just because he could: this was a central theme to *Frankenstein*, who thinks of himself as a god and is obsessed with his own glory—and not worried by any of the moral ramifications of his actions. Pupin also had the foresight to include warnings in his vision of ideals at the end of his autobiography, writing that not only must the world be made safe for democracy, but democracy must be made safe for the world through scientific education with an emphasis on social well-being.<sup>849</sup>

Maxwell's poem warned that it was pride that led men to misinterpret the meaning of the nature of earthly gifts. "Much he lauds the education/ Which has raised to lofty station/ Men whose powers of calculation/ Calculation self defied./ How the learned fool would wonder/ Were ne know to see his blunder/ When he put his reason under/ The control of worldly pride./ In our algebra the measure/ Of that unexhausted treasure/ That affords the purest pleasure/ Ever found when it is sought/ Let us rather, realizing,/ The conclusions thence arising/ Nature more than symbols prizing,/ Learn to worship as we ought."

This poem again demonstrates the variety of concepts that were interwoven with literary forms. Thence the polymathy. Whewell edited book on churches (as did Pupin); was concerned about corporations; wrote six lectures on political economy (how to assign price and labour); and opposed evolution in *The Bridgewater Treatises on the Power, Wisdom and Goodness of God as Manifested in the Creation*, No.3: "The results of true geology and astronomy cannot be irreconciled with the statements of true theology." This is parallel to Pupin's view, which we went over earlier, that a scientific understanding of the stars actually leads to the divine.

We shall also review other of Pupin's views explored in this work so far. Pupin was explicit in his autobiography of the importance of his early education in the classics, solidified with his friendship with Bilharz who may have given him the impetus to refine his understanding of science as poetry. His view of education was that it was to build character, enable a student to live a life worth living and lead them to perceive God's sublime creation. The motive in science was not to worship the machine, but to strive to

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<sup>848</sup> Ruskin references in this paragraph from Alexander, "Ruskin."

<sup>849</sup> Pupin, *Immigrant*, 373.

reach the eternal truth. He was not quick to assume that civilization had reached its lofty aim to raise man to Olympian heights, explaining this was only true in terms of conquest of space, not spirit. His humility was second perhaps only to his honesty: such as in the passage where he depicts his longing to live the life of a pipe player, whose knowledge was definite and attainable. Inventions, he wrote, are mortal; laws are unchangeable.<sup>850</sup> Humility is the virtue of men with a truly scientific attitude; in the presence of God's truth, they bow down and cheerfully accept any place which truth assigns them.<sup>851</sup> He was also not quick to overly praise the discovery of an invention: anyone is as likely to arrive at a solution as me because such problems are those that thousands are trying to solve.<sup>852</sup>

Bilharz, the theology student whose career as priest was ruined by a love affair but whose informal lessons were of paramount importance to Pupin, acted as a satyr in pronunciation and an orator of the philosophers and artists of Greece. He would recite Latin and Greek and Shakespeare and Goethe: a veritable *laudator temporis acti*. "He thought only of things that happened three thousand years ago when Homer sang and the Olympian gods guided the destinies of men, but he cared for nothing else."<sup>853</sup> He considered the steam engine was invented to lead men astray, and was a harsh critic of Pupin's attraction to science: "I sometimes suspected that he felt alarmed by what he considered my worship of false gods, and that this impelled him to do everything he could for my redemption from heathenism."<sup>854</sup> While Pupin was very much an idealist of science, he explains that his idealism was tempered by Bilharz's influence: "According to him the first [idealism of classical Greece] had its seat among the gods on the ethereal top of Mount Olympus and the second one [realistic materialism of modern America] was sinking deeper and deeper through the shafts of coal and iron mines into the dark caverns of material earth. 'No

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<sup>850</sup> As this was only mentioned once, the page will be referenced here: Pupin, *Immigrant*, 220.

<sup>851</sup> Pupin, "The New Reformation I." This view is also implied on the page in the preceding footnote.

<sup>852</sup> "To Telephone To Land: Prof. Pupin explains his recent electric discoveries," *The St. Paul Globe*, May 8, 1907, 7, accessed September 5, 2011, <http://www.chroniclingamerica.com>. Similarly, he writes how each scientist contributes to finding "a morsel of the eternal truth" and that concepts found by one scientist take on new, innovative dimensions in another scientist's mind. Pupin, *Immigrant*, 221-2. This latter idea corresponds to Whewell's notion of colligation.

<sup>853</sup> Pupin, *Immigrant*, 86.

<sup>854</sup> *Ibid.*

action,’ said Bilharz, ‘which needs the assistance of a steam-engine or of any other mechanism can trace its origin to idealism nor can it end in idealism.’”<sup>855</sup>

But Pupin didn’t agree with Bilharz’s arguments where he argued against American materialism, which he tried to make responsible for the alleged materialism of the evolution theory, which Bilharz kept abreast of.<sup>856</sup> In Bilharz, then, readers of Pupin’s autobiography see embodied in a character and expressed by him the views of the classical education. We have also seen how Bilharz was the inspiration for the first story Pupin composed, and how it was in response to his criticism that Pupin developed his understanding of science as poetic. Considering that the poetic in terms of the metaphor connects different things or meanings, finding their similarities, yet retaining the integrity of their differences, Pupin’s view of science in this respect is creative in more than one respect because his view of science is not made retrogressive but is merely made more sophisticated through the broadened, classical scope he brings to it.

As one of the essays in *Modern American Prose* explains, the classics are needed as the fallow to give lasting and increasing fertility to the natural mind by breaking up the clods but also to, “enrich it by bringing back into the mind of the youth of today that which has escaped into the air of the ages”.<sup>857</sup> One of O’Connor’s most famous essays is about how important it is that literature be taught as a subject with a history, in order for students to get the “total effect”. This chapter, then, reflects the not only the historical aspect of this “total effect” but moral aspects, too. “In our fractured culture, we cannot agree on morals, we cannot even agree that moral matters should come before literary ones when there is a conflict between them. All this is another reason why the high schools would do well to return to their proper business of preparing foundations.”<sup>858</sup>

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<sup>855</sup> Pupin, *Immigrant*, 90-1.

<sup>856</sup> *Ibid.*, 91.

<sup>857</sup> John Agricola, “The Fallow,” in *Modern American Prose Selections*, ed. Byron John Rees (New York: Harcourt, Brace and Howe, 1920), accessed September 5, 2011, <http://www.gutenberg.org/files/19739/19739-h/19739-h.htm>.

<sup>858</sup> Flannery O’Connor, “Fiction is Subject with a History – It Should Be Taught That Way,” *The Georgia Bulletin*, March 21, 1963, accessed September 5, 2011, <http://georgiabulletin.org/local/1963/03/21/a/>.

## 5 Myths: True and False

If, as literary critic Guy Davenport writes, the notion of a “public” is a fiction, it is questionable how much an assessment of a culture, or a person, is not also a fiction, or even a myth, for these are not stagnant entities that can be “pinned down” to use a phrase from Toni Morrison’s Nobel Peace Prize acceptance speech.<sup>859</sup> And if there are no ‘conclusive’ pictures of society, surely there are at least outlines, which appear to be relevant to a group of people at a given time, as per Halbwachs’ notion of collective memory, dependent on the framework within which a group in society is located. To some extent, Pupin’s autobiography corresponds to the myth of the success man,<sup>860</sup> intimated already in the articles cited earlier about Pupin and his accomplishments: a myth that pervaded even the newspapers of the day. But in some ways, he broke that myth open, insisting on a classical humility, adding to it social visions, and bringing to that very white male myth an Eastern European mother called Olympiada. There are, as this implies, cultural myths to tend with: and not only those made of a culture but also those manufactured from within a culture.

Culture, in this section, will be considered within the rubric of myth, particularly because thus far, this work has shown how myth can be very real in its didactic function, and in the symbolic system it proposes, according to which lives are lived.<sup>861</sup> According to Eliade, the traditional narrative of some cultures is divided into true stories—i.e., myth, and false stories—i.e., fable.<sup>862</sup> Distinguishing the two is not always easy if at all possible.

Roland Barthes’ understanding of ‘myth’ in *Mythologies* was the ‘naturalness’ with which newspapers, art and common sense constantly dresses up reality, which even though

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<sup>859</sup> Toni Morrison, “Nobel Lecture”, accessed September 5, 2011, [http://www.nobelprize.org/nobel\\_prizes/literature/laureates/1993/morrison-lecture.html](http://www.nobelprize.org/nobel_prizes/literature/laureates/1993/morrison-lecture.html). “The vitality of language lies in its ability to limn ... actual, imagined and possible lives ... Although its poise is sometimes in displacing experience it is not a substitute for it. It arcs toward the place where meaning may lie... Language can never “pin down” ... Nor should it yearn for the arrogance to be able to do so.”

<sup>860</sup> We shall examine the Horatio Alger Myth, as it is sometimes called, but it is significant that a popular mid-19<sup>th</sup> century genre was that of the self-made man, the first written by Charles C. B. Seymour, but the second written by Harriet Beecher Stowe: one of her subjects was her brother, who Pupin wrote so highly of, and had possibly read her work, as he also mentions that he had enjoyed her most famous novel, *Uncle Tom’s Cabin*. Another similar title worth mentioning in terms of the catch phrase in the title that is still used today was Herman Melville’s *The Confidence-Man*, and another in terms of its long-term impact is Andrew Carnegie’s 1908 *The Road to Business Success: A Talk to Young Men*.

<sup>861</sup> Mircea Eliade, *Myth and Reality* (Prospect Heights, IL: Waveland Press, 1998), 19.

<sup>862</sup> *Ibid.*, 10-11.

it is the one we live in, is undoubtedly determined by history. In this way, myth becomes the way in which a cultural phenomena works to persuade people how the social forces shaping them are ‘natural’. Any aspect of modern culture that is taken for granted may be a myth, and may be analysed as a text.<sup>863</sup> This is significant because in this way any work of history may be given a close, literary, reading and can become part of the discourse on literature. Such an approach has been taken in previous chapters: what is relevant here is how much of history is mythical, i.e., social forces conceived as being truths when in fact they are constructs.

The popular understanding of myth, meaning ‘legendary’ or ‘imagined’ is relevant here, particularly considering how culture has been ‘sold’ by steamship operators, trying to get travelers from the ‘old land’ to cross the ocean to America. We remember that Pupin travelled on one such ship and can speculate whether he was sold any promises of the new land. A popular understanding of myth is also relevant if we are to consider the degree to which the *ideals* of culture held the various facets of the late-19<sup>th</sup> century imagination. There was an entire movement, for instance, to revisit the traditional, village culture at the turn of the last century, though it never came to much, despite the enormous energy poured into it—and even lives devoted to it. Whether that movement was fuelled by an accurate understanding or by myth is still debated. We saw in chapter 4.1. that the genre of historical fantasy emerged with aplomb in the 19<sup>th</sup> century. An earlier precedent is Voltaire’s *Zadig*, and an early 20<sup>th</sup> century example, Kipling’s *Puck of Pook’s Hill*, presented a fantasized English history. Well known 19<sup>th</sup> century novels in this genre include Mary Shelley’s *Frankenstein*, many of Edgar Allan Poe’s works, and Bram Stoker’s *Dracula*. The first work explores the fantastical extremes of science and the last, of culture. Perhaps in this context we could also consider *Ossian*, MacPherson’s literary falsehood—not from word of mouth in Scots Gaelic, but of his own making. *Ossian* inspired both Goethe (*The Stories of Young Werther*) and Herder. *Ossian* reveals part of the how and why particular cultures and histories are more open to myth than others.<sup>864</sup> Interestingly, all of the works mentioned in

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<sup>863</sup> Roland Barthes, *Mythologies* (New York: Farrar, Straus and Giroux), 1972.

<sup>864</sup> “Wordsworth’s assertion of the failure of MacPherson’s *Ossian* to “amalgamate with the literature of this island” needs some qualifications. That it did not enter into English literature in a formative way, as Percy’s Ballads did, is true enough, and is easy to explain. In the first place, it was professedly a prose translation from poetry in another tongue, and could hardly, therefore, influence the verse and diction of English poetry



this paragraph can be classified as either Romantic or Victorian, yet through their fantastical or mythical elements they are rather more timeless than that classification suggests.

Davenport concludes that he “demonstrates that *there is no one way of telling the tales of the tribe*”.<sup>865</sup> He writes that myth is a tale anyone can tell, not a story in a particular form, or with a particular finish.<sup>866</sup> Therefore, it was decided that the title of this chapter involve the word *myth*—and to leave it up to readers how *true* these stories are, just as these same questions are raised through Pupin’s autobiography.

### 5.1. A return to romantic ideals

Anthony D. Smith, in *The Antiquity of Nations* has written that all forms of nationalism involve something of romanticism in them, though not necessarily of German Romanticism. He further points out that this “romanticism” is more, “protean and elusive to define than nationalism”, as expressed through art, literature, moral philosophy, and psychology. As such, Smith writes, nationalism involves the primacy of individual/collective will and (in)action; the culture of the particular and cultural diversity; a yearning for authentic and free self-expression.<sup>867</sup> This corresponds with the opening chapter of Pupin’s autobiography where he writes that the Serb ballads that were recited inspired him with the feeling that, “the noblest thing in this world is the struggle for right, justice, and freedom.”<sup>868</sup> He then explains this love of freedom and the history of the Serbs who were told they could have this freedom if they defended Austria, but this was promise

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directly. It could not even work upon them as directly as many foreign literatures have worked; or, as Italian, French, and German have at various times, worked; for the Gaelic was practically inaccessible to all but a few special scholars. Whatever its beauty or expressiveness, it was in worse case than a dead language, for it was marked with the stigma of barbarism. In its palmy days it had never been what the Germans called a *kultursprache*; and now it was the idiom of a few thousand peasants and becoming extinct even in its native fastnesses,” Henry A. Beers, *A History of English Romanticism in the 18<sup>th</sup> Century* (New York: Henry Holt and Company, 1899), accessed October 8, 2012, <http://archive.org/details/historyofenglish00beer>.

<sup>865</sup> Davenport, *Geography*, 263. Emphasis added. He attributes the first structuralist study of myth to Plutarch.

<sup>866</sup> *Ibid.*, 255.

<sup>867</sup> Anthony D. Smith, *The Antiquity of Nations* (Malden, MA: Polity Press, 2004), 244.

<sup>868</sup> Pupin, *Immigrant*, 8.

was not kept, and Pupin observes that this treachery marked, in his opinion, “the beginning of nationalism”.<sup>869</sup> Thus in the opening pages are references to a nationalism communicated through stories (art, literature) that involved a yearning for freedom. And hanging in Pupin’s house was a picture of Karadjordje: the leader of the First Serbian Uprising and who during the Austrian-Turkish War led a band of *hajduks*, who are described in much Western literature as romanticized hero figures (or even romantic myth)<sup>870</sup> who—very factually—fought against the Ottoman rule. It could be said this picture was an authentic image of the bid for freedom.

Earlier in this work, it was pointed out how national identity consisted of a Romantic yearning for ‘authenticity,’ as per Rousseau and Herder, but, we could also add, as expressed in the American Declaration of Independence. Herder is generally attributed with popularizing authenticity: i.e., authentic nature, history. He considered that history could uncover valuable, intrinsic, and unique cultural values, and ultimately a ‘golden age’ when the nation was most glorious, creative. He sought to make ethnic memories and popular symbolic myths vivid and palpable to large numbers of people: language and cultural tradition were attributed with the creative force that could make a nation. This included the categories of folklore and dance, which were further popularized by the Grimm brothers. A perfect example of how these ideals continued to flourish a generation later is Tagore’s, though a writer, the schools he established taught folk arts including dance.<sup>871</sup> Pupin writes of dance rather significantly twice in his autobiography; the first time when the *kolo* dances at a wedding on one of his returns to Idvor caused him to long for a simpler life that his mother argued him out of—through her stellar metaphor.<sup>872</sup> The second time was on his trip to Scotland as he sought something of the spirit of Maxwell as he read his works, and marveled at their dancing, which reminded him of Idvor and made

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<sup>869</sup> Pupin, *Immigrant*, 9.

<sup>870</sup> For example, and to cite two very different types of literature: Wendy Bracewell, “The Proud Name of Hajduks”, *Yugoslavia and Its Historians: Understanding the Balkan Wars of the 1990s*, edited by Norman M. Naimark and Holly Case (Stanford: Stanford University Press, 2003) 34; Cyrus Leo Sulzberger *The Big Thaw* (New York: Harper and Brothers, 1956), 167.

<sup>871</sup> A student of one of these schools, Mrinalini Sarabhai, was one of the first upper class female dancers; she is mentioned here because she went to the same Swiss boarding school as this author; just like Pupin taught at this author’s alma mater.

<sup>872</sup> Pupin, *Immigrant*, 168. Later, when Pupin regained his focus as a student, he paid less attention to *kolo* dancing, 190.

him feel at home.<sup>873</sup> The dance, to Pupin, demonstrated the Scot's "originality, individuality, and sturdiness", and claims it gives special insight into the Scottish mentality;<sup>874</sup> noting, too, that just as he felt at home on seeing the dance, on the Macedonian front, Serbian soldiers were said to have got on famously with their Scottish counterparts.<sup>875</sup> Pupin muses that perhaps the Serbs and Scots came from the same tribe in ancient Iran,<sup>876</sup> which could be taken, if tenuously, as an argument for Serbian cultural or national proximity to another European nation: a similarity highlighted by parallels in national dance, one of Smith's definitions of the expressions of nationalism.

In contrast to Smith, who saw Balkan states as the result of the failure to achieve rational, liberal Western nationalism,<sup>877</sup> which is a confusing concept if we are to accept claims of 'authentic and free self-expression', Herder predicted that Slavic states would again possess "the finest country of Europe" and prosper due to their ideals and industrious, peaceful ways.<sup>878</sup> He implied that Hungary would be assimilated by the Slavic peoples who "now deeply sunk ... will at length awake from their long and heavy slumber, shake off the chains of slavery, enjoy the possession of their delightful lands from the Adriatic Sea to the Carpathian mountains, from the Don to the Moldaw, and celebrate on them their ancient festivals of peaceful trade and industry"<sup>879</sup>—which led to the Magyar insistence that theirs become the national language, though there were many other ethnic groups within what was then the Kingdom of Hungary, somewhat subordinate to Vienna.<sup>880</sup>

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<sup>873</sup> Pupin, *Immigrant*, 212-13.

<sup>874</sup> *Ibid.*, 214.

<sup>875</sup> *Ibid.*, 213.

<sup>876</sup> *Ibid.*, 213.

<sup>877</sup> Smith, 243.

<sup>878</sup> Herder, *Outlines*, vol. I.

<sup>879</sup> *Ibid.*, 483-4.

<sup>880</sup> Peter F. Sugar, and Peter Hanak, *A History of Hungary* (Indiana: Indiana University Press, 1990), 180. See John R. Commons, *Races and Immigrants in America* (New York and London: The Macmillan Company, 1907), 81, accessed September 5, 2011, <http://www.gutenberg.org/ebooks/34028>, "The Magyars are the Asiatic conquerors who overran Europe ten centuries ago, and being repulsed by the Teutons to the west established themselves on the Slavs in the valley and plains of the Danube. Boasting a republican constitution a thousand years old they have not until the past year been compelled to share it with the people whom they subdued. Astute politicians and dashing military leaders, they are as careless in business as the Slavs, and the supremacy which they maintained in politics has slipped into the hands of the Jews in economics."

This particular example is relevant to Pupin's autobiography through the Austro-Hungarian connection and the tension Pupin felt towards that empire, which, as we have seen, had reneged on its promise to the Serbians who fought along its borders. This theme is inceptive in the autobiography, and many biographical articles about Pupin stressed that he headed for America to escape required military service (which would have been to Austro-Hungary). As we see from the Herder extract, there is an argument for the Serbian, Slavic claim to that territory and can explain Pupin's anecdotes about the hostility and nationality-based clashes he was a part of as a student in Pančevo and Prague, his respect for Jan Hus, and his account of his eventually successful struggle against Germanic prejudice during his postgraduate studies in Berlin. The romantic and idealist answer to these tensions may have been depicted on the wall of his childhood home, in the image of Karadjordje.

## 5.2. Serbia and Goethe: Romanticism and science

To consider the 'folk' and 'Serbia' (here, considered as the Kingdom of Serbia, including Serbs in what is today Croatia), one is led to both the epic poems that Goethe inspired many to collect for a Western audience, as well as the political problems of narration. By that, we also mean that the story of history is recounted by victors. But if, as Grafton writes, history, in the thought of humanists and ancients, belonged to an art of rhetoric, wherein 'narrative' is primarily designed to embody the principles of morality in the form of well-told stories about great men,<sup>881</sup> those who have told the tales of Serbia become part of a story themselves, determined by whether they are Brutuses<sup>882</sup> or Cincinnatuses.<sup>883</sup> This chapter will attempt to bring Serbia's narrators into a story about their stories, while also considering Romantic Idealist tales—as far as romantic idealism and Pupin's place in it was explained in an earlier chapter. The twist in these tales come from modes of

<sup>881</sup> Anthony Grafton, *Worlds Made By Words* (Cambridge, MA: Harvard University Press, 2009), 37-8.

<sup>882</sup> Brutus murdered Caesar – the motives popularized in Shakespeare, *Julius Caesar* 1.2., accessed September 5, 2011, [http://shakespeare.mit.edu/julius\\_caesar/full.html](http://shakespeare.mit.edu/julius_caesar/full.html), where Cassius argues: "The fault, dear Brutus, is not in the stars, but in ourselves, that we are mere underlings".

<sup>883</sup> In short, a model of civic virtue.

appropriation—for to retell can also be to reappropriate, and often entails the tailoring of the tale to suit one's public: hence the romanticism, and idealism. The other focus of this chapter will be on the scientific claims of telling, whether that be through the formation of a system through which a subject is viewed or through the stories about Serbia of scientists (like Goethe) themselves. These subjects were inextricable in these earlier periods, *bound to the personalities* and the writings they produced, and so presented here together, if by way of sketch of subjects that were conflated to begin with.

Early Serbian literature flourished at Ragusa, while Evans, self-crafted Balkan politician and technically a scientist in his own right, an archaeologist whose passion for myth was satisfied by his archaeological digs at Knossos, despite his deep prejudices writes that, “The greatest glory of Ragusa lies neither in her wealth nor in her princely hospitality, but rather in the civilizing influence which she exercised over the most barbarous European member of our Aryan family.”<sup>884</sup> Lewis Graham Smith, Pupin's son-in-law, in a series of *New York Times* articles<sup>885</sup> documents the cultural elements which few foreigners know, filling out Evans' reference to Ragusa, but which surfaced albeit in a different guise for a brief moment during the cultural project instigated by Goethe, another scientist-writer, in the 19<sup>th</sup> century. Smith writes that under the influence of the Renaissance, the Ragusan poet Gundinlich (his spelling) wrote a song in the 16<sup>th</sup> century of the past glories of the Southern Slavic empires. In 1756, the missionary monk poet of Ragusa Kachich Myoshich (Smith's spelling) wrote “pleasing words for the Slavonic people” (Serbians, Bulgarians, Croats), and Ragusa was the cradle of the South Slavic movement until the Napoleonic wars wiped it out. It could be argued that he was furthering the cultural work of Pupin, who introduced American readers to Serbian ballads: to Prince Marko, and *vilas*. But many travelers to Serbia and Southeast Europe on the whole did not take the trouble to learn of its ways as Pupin learned the Highland dance, but were content to project their own readings onto these lands. The complications of learning the ways are highlighted by the Ragusan example of this paragraph: Ragusa is tied to both Serbia and Croatia; it also got more European

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<sup>884</sup> Arthur Evans, *Through Bosnia and the Herzegovina on Foot, during the Insurrection, August and September 1875, with an Historical Review of Bosnia and a Glimpse at the Croats, Slavonians and the Ancient Republic of Ragusa*, accessed August 6, 2012, <http://archive.org/details/throughbosniaher00evanrich>, qtd. in MacGillivray, *Minotaur*, 49.

<sup>885</sup> In C.U. Rare Books, M.S. 1035.

travelers, being more or less en route of the Grand Tour, giving it disproportionate attention.

That the geography of the region was particularly inspiring to the European imagination may be seen in its description as a “labyrinth of creek and island that fringes the Adriatic”.<sup>886</sup> Evans projected similar visions onto that land, in his mythical descriptions: “Just beyond Fort Opus ever and anon mysterious boomings and bellowing are heard to proceed as from the inmost recesses of the mountain. It is, say those who have heard it, as the bellowing of a bull.” The rational explanation of pent-up air in submerged caverns occurred to him, but Evans preferred a version of Charles Kingsley’s beastly creation: “A veil of mystery hangs over the whole... nothing but the portent is certain; and fearful as I am of giving publicity to ill-omened words, I cannot refrain from breathing a suspicion that this unhallowed bellowing may proceed from some hideous Minotaur, cavered in his labyrinthine den.”<sup>887</sup>

It is curious that in the 20<sup>th</sup> century myths were still being projected onto landscape—one wonders if similar myth making lies behind the sea monsters reported in Herodotus. There are regions that seem to be consistently viewed through myth, not reality. According to Pupin’s insistent editorials in *The New York Times* in the period leading up to WWI, Austria led an insidious propaganda campaign against the Serbs. Todorova, in *Imagining the Balkans*, has shown just how much the region has revealed some of the extent of such myth making: “It is curious how the manner of narration often reflects the national characteristics of the travelers.”<sup>888</sup> Few Western travelers were sensitive to the complexities and implications of oppression, which, if we remember, was the opening cultural note in Pupin’s autobiography and also the reason he went to America. Lady Muriel Herbert, a nurse if not a scientist, in her letters “Serbia and the Serbians” wrote that

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<sup>886</sup> John Richard Hale, *Famous Sea Fights* (Boston: Little, Brown & Co., 1911), accessed August 7, 2012, <http://www.gutenberg.org/files/25088/25088-h/25088-h.htm>.

<sup>887</sup> MacGillivray, *Minotaur*, 46.

<sup>888</sup> Ivan Shishmanov, qtd. in Maria Todorova, *Imagining the Balkans* (New York, Oxford: Oxford University Press, 1997), 114.

she believed in the future of the Serbian empire, and the country being “full of odd things”, like Austrian prisoners turned Serbian gendarme.<sup>889</sup>

From today’s vantage point, and again, judging by contemporary media surrounding Serbia, it can seem particularly fascinating that so many writers have written about the ever-antagonized country. Yet those whose often romantic pen addressed it include Hugo, Goethe, the Grimm brothers, Schiller, Feliks Kanitz, Herman Wendell—not to mention D’Annunzio’s “Ode to the Serbian People” and Berthold Brecht’s “Bericht der Serben”. Adding to the complexity of narratives about or involving Serbia, in addition to the numerous changes to geographical-political national designation in the past century,<sup>890</sup> it has further been argued that the literature of one such national designation, the former Yugoslavia, was written by Yugoslav cosmopolitans who place themselves outside of the national context, because “at home, in their country of origin, their significance is contested”.<sup>891</sup> The mythical nature of this group of Slavs is also confused by the notion that some nationals are not true to their own nation. An example is Rilke doubting Gorky’s “Russianness”, distrusting his linking art and ideology, calling him “a Westerner corrupted by fame”. Gorky claimed to support the revolutionary cause, but spent most of his life in the West where he—not unlike Charles Simić?—cultivated the image of a flamboyant hobo writer, exploiting literary fame to generate an income.<sup>892</sup> The inspired subjectivity of modern art considered earlier in this work, also characteristic of romanticism, subsumes a more scientifically accurate (i.e. objective, empirically-founded) image of a nation or its nationals, in part due to loss of opportunity and reaffirmation in the homeland.

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<sup>889</sup> Lady Muriel Herbert, “Serbia and the Serbians”, *Letters from Lady Muriel Herbert* (London: Waifs and Strays Society, 1916), 76.

<sup>890</sup> It went from being the Principality of Serbia in the 19<sup>th</sup> century (1804-1878), to the Kingdom of Serbia in the 19<sup>th</sup> century and early 20<sup>th</sup> century (1878-1918), to the Kingdom of Serbs, Croats and Slovenes, or the Kingdom of Yugoslavia until the mid-20<sup>th</sup> century (1918-41), to Yugoslavia until 1992, to Serbia and Montenegro until 2006, and is today independent Serbia.

<sup>891</sup> Guido Sael, “Miloš Crnjanski in Exile,” in *The Exile and Return of Writers from East Central Europe: A Compendium*, ed. John Neubauer and Tarak Szuzsana (Berlin, New York: Walter de Gruyter, 2009). This paper addresses parts of the former Yugoslavia, as a place where Serbs lived and which were once part of the Kingdom of Serbia, therefore, this point also applies to those who could be or would describe themselves as ‘Serbian.’

<sup>892</sup> Anna Tavis, *Rilke’s Russia* (Evanston, IL: Northwestern University Press, 1994), 104-105.

It is pointed out in the chapter on the modern in Jovan Deretić's *Kratka istorija srpske književnosti* that it was only in the 20<sup>th</sup> century that academics and scientists could find success at home: unlike the examples he gives of Tesla and Pupin who reached the top of their fields, physics and science only in America.<sup>893</sup> One of these success stories was that of Branislav Petronijević, an esteemed philosopher and paleontologist who wrote works in Serbian, German, and French, and also spent time abroad. Aside from his discoveries in paleontology, he is also cited as a devoted philosopher in an anecdote in Bertrand Russell's *Collected Papers*.<sup>894</sup> He is relevant for us here is because he, like Pupin, also wrote an autobiography, and though not poetic, it is noted that he did write verse, as a separate endeavour. His autobiography aptly bears the name "sketches" in the title; one sketch does not lead into the other, and is more matter-of-fact in tone than Pupin's autobiography.<sup>895</sup> Petronijević is also known as perhaps being the first person to translate Roger Joseph Bošković's *A Theory of Natural Philosophy* from the Latin into English at Russell's suggestion:<sup>896</sup> just as Bošković, mentioned in an earlier footnote, wrote in Latin, so did Petronijević write in the academic tongues of the day. The implications of this could be a work unto itself, so shall just be mentioned in passing here.

It is therefore interesting that another, if earlier, Serbian scientist, Atanasije Stojković, wrote the first Serbian scientific treatise of its sort in Serbian, the three-tomed *Fizika*: and it is noted that his other work on meteors was the first book on meteors in the world. Stojković also wrote a novel in the style of Voltaire's *Candide*. This book, *Aristid i Nataija*, is classified by Deretić as a didactic-idyllic novel, the first of its kind in Serbian.<sup>897</sup> It is noted that the title does not "sound" very Serbian. Stojković can be said to have set many precedents: those he set followed by Pupin include being educated overseas

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<sup>893</sup> Jovan Deretić, „IX: Moderna“ *Kratka istorija srpske književnosti*, accessed 2 June 2010, [http://www.rastko.rs/knjizevnost/jderetic\\_knjiz/jderetic-knjiz\\_09.html](http://www.rastko.rs/knjizevnost/jderetic_knjiz/jderetic-knjiz_09.html)

<sup>894</sup> Bertrand Russell, *The Collected Papers of Bertrand Russell, Vol. 11* (London and New York: Routledge, 1997), 102.

<sup>895</sup> Branislav Petronijević, "Autobiografiska skica", *Autobiografija, pesme, prepiska* (Beograd: Zavod za udjbenike i nastavna sredstva, 1998).

<sup>896</sup> An interesting comparison could be made of their view of each other's two meetings: Russell noted that during one, he would try to talk politics with Petronijević, who kept interjecting questions about science, and that they spoke in German, cited in Russell, 102; the latter noted that during this meeting more was said about politics and the impending war than about science, and that they spoke in French and English, cited in Petronijević, 59.

<sup>897</sup> Jovan Deretić, „IV: Prosvećenost i počeci nove književnosti“ *Kratka istorija srpske književnosti*.



(Stojković pursued his advanced studies in Russia), international recognition as a scientist, and the pursuit of writing.

In contrast to Stojković, Pupin's classical influences did not get channeled into romantic literature; rather Pupin channeled those influences into his romantic vision of reality, i.e., his wish for reality to reach ideals. The cross-over between reality, science, and myth is addressed in a recently-written Serbian novel by Aleksandar Jugović, *Srpski u sto lekcija*, which sounds like the name of a textbook (Serbian in one hundred lessons) yet addresses figures from Serbian's history in a novel that is historically aware of the novel as a historic form: the author considers to date from Constantine VII Porphyrogenitus 7<sup>th</sup> century writings.

Genre is problematic: insofar as Pupin's autobiography ends with romantic democratic ideals, the question may be raised as to how novelistic a novel is that takes history for its theme. If history is to be viewed as a Ciceronian commonplace as it was again in the Renaissance, it is both teacher and implicitly tied to the narrator: "By what voice, too, than that of the orator, is history, the evidence of time, the light of truth, the life of memory, the directress of life, the herald of antiquity, committed to immortality?"<sup>898</sup> It is from this Ciceronian passage that the phrase *historia magistra vitae est* was coined.

Viewed from the outside, as a literary possibility, Jugović's novel raises the possibilities of revisiting genre, as Pupin's book does, though without romanticism. One of Jugović's characters reading through his father's writings discovers that nothing new is learned of people's fates when viewed over time because while the forms of life may change, the essence remains the same. In recounting such a story, Jugović considers that he has combined how Aristotle defined history and literature: that the former address what has taken place: the latter, what could have.<sup>899</sup> The science in the novel may be taken to be the history ostensibly presented neutrally; the national aspects are not promoted as love of homeland as they are by Pupin but difficulty and historical victimization. Although separating the authors is a period of approximately half a century, another question

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<sup>898</sup> Cicero, *On Oratory and Orators*, trans. J. S. Watson (New York: Harper and Brothers, 1860), accessed January 9, 2010, <http://archive.org/stream/ciceroonoratoryo00cice#page/92/mode/2up>, 92.

<sup>899</sup> Marina Vulićević, "Srpski u sto lekcija" *Politika Online*, August 5, 2008, accessed October 26, 2014, <http://www.politika.rs/rubrike/Kultura/Srpski-u-sto-lekcija.lt.html>.

pertaining to the romantic spirit that can be found in Pupin's writing even after romanticism might be whether the scientist's view, as opposed to the view of those working within the humanities (like Jugović, writing a novel), extended romanticism—until the close of the 20<sup>th</sup> century. A writer like Jugović might then be more pessimistic, simply through lack of the forward-thinking hope of the sciences and what they could achieve if understood properly (we remember that Pupin made this stipulation).

Another Serbian scientist and writer Milutin Milanković, who knew Petronijević<sup>900</sup> and may be compared to Pupin because he also worked towards popularizing science, has said of his own life that his pursuit of science saved him from the troubles of the world: "In my scientific vocation I have found a pleasant shelter, for I was protected by it from many turbulences that shook the world. Under that roof I have prepared and equipped my scientific workshop, segregated from the wider world but in constant spiritual connection with famous scientists, I have created my scientific area, my indisputable spiritual property. In this workshop I have spent forty years including short breaks writing and publishing my papers."<sup>901</sup>

Milanković, a self-described Romantic as a youth,<sup>902</sup> was raised according to the precepts of Rousseau's *Émile* by his father.<sup>903</sup> He notes how poetry is conducive to learning, citing Ostwald, and early in his reminiscences praises Serbia's poetic legacy.<sup>904</sup> In a chapter about one of his returns to Belgrade, he opens with the old saying, judge no one by their appearance, but by their soul!<sup>905</sup> This may be a fitting epithet for this chapter: a Romantic concession made by a scientist on the difficulties of knowing a subject. It is a poetic statement in that it seeks meaning behind the literal. This observation is reminiscent of Aleksandar Diklić's that it is easier to love Serbia than to understand it; a reality that is sometimes lost on foreigners.<sup>906</sup> Diklić is also interesting to this discussion because his book is termed as a "sentimental" look at history: belonging to the genre of history while

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<sup>900</sup> Milan Milanković, *Uspomene, doživljaji, i saznanja* (Beograd: Zavod za udjbenike, 2009), 913-16.

<sup>901</sup> Ibid., 37.

<sup>902</sup> Ibid., 33.

<sup>903</sup> Ibid., 96, 98-9, 102.

<sup>904</sup> Ibid., 99.

<sup>905</sup> Ibid., 518.

<sup>906</sup> Aleksandar Diklić, *Beograd veći grad: sentimentalno putovanje kroz istoriju* (Belgrade: RTS, 2014), 282.

not professing to be recounting “the” history of the city of Belgrade that forms his subject. So even in the example of his book on history, the lines are blurred between professed myth and reality.<sup>907</sup> The passage where Milanković writes that one should not judge by appearance expresses how beautiful Belgrade appears despite its squalor and includes very long conversations—perhaps the longest in the book, revealing the importance of the social element of narrative that reveal a spirit seeking to overcome trials such as enemy occupation. But this latter point is implicit: beneath the surface.<sup>908</sup>

The complexity of who the ‘genuine’ voice of a culture can be—possibly clearer in Germany, where Goethe and Herder seem to speak for all, and openly, authoritatively, is frustrated by politics and its various designs, including (physical) occupation. We have seen how Pupin’s autobiography begins by addressing these tensions, and ends with an idea of ideal democracy. Herder, who was a citizen in the German city of Latvia, saw how Lattish culture was repressed and while many other cities of Eastern Europe were German speaking, local populations spoke Slavic or Baltic languages. His definition of people and place is close to Rilke’s reading—Rilke having also grown up in Bohemia, a Czech province in Austria-Hungary, and having viewed the West as having killed off its own access to genuineness. Herder wrote how the development of events is determined by locality, circumstance, and human character: “all possible development is determined in part by the position and of the necessity of the locality, in part by circumstances and the opportunities of the age, and in part by the inborn and self-nourishing character of the peoples... All events in the human sphere, like all products of nature, are decreed solely by time, locality, and national character, in short by the coordination of all the forces of life in their most positive individuality.”<sup>909</sup>

Thus emerges his critique of German culture, that if it is to follow the trends of the age, it should at least do so in its own way: “If Germany were only guided by the forces of the age, by the leading strings of her culture, our intellectual disposition would doubtless be poor and restricted, but it would be true to our own soil, fashioned upon its own model, and

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<sup>907</sup> As the previous footnote indicates, the very title of the book in Serbian is *Belgrade the Eternal City: A sentimental journey through history*: by virtue of the journey through history being sentimental, the reader expects Romantic or at least subjective overtones.

<sup>908</sup> Milanković, *Upsomene*, 518-22.

<sup>909</sup> Herder, *Materials*.

not so misshapen and cast down.” Germany, to Herder’s eyes, was bent out of shape because Germans were being least true to themselves. He quoted Tacitus further in writing that Germany had, “imitated a tyrannical people for a long time” and through “intellectual servitude”.<sup>910</sup> Pupin certainly did not call the Germans tyrants, though recorded some initial animosity; rather, it was the Austrians who were tyrants and made disingenuous by their braided uniforms.<sup>911</sup> Pupin’s memorable illustration of a culture being true to itself, as per Herder’s ideal for Germany, was his description of his village, which, while poor, had inhabitants who considered themselves superior because of their village’s history to transient tradesmen and practitioners, no matter how wealthy.<sup>912</sup>

That history was not enough to impress the humanist Herder or Goethe, who both retained subtle tones of superiority, such as in Herder’s description of “Slavian Nations”: “Notwithstanding their occasional achievements, they were never enterprising warriors or adventurers, like the Germans: these they for the most part followed quietly, occupying the places they evacuated”.<sup>913</sup> They were also “submissive and obedient” though this was because they were “liberal, hospitable to excess, lovers of pastoral freedom... enemies to spoil and rapine.”<sup>914</sup>

This offshoot of the humanist project arguably did much to promote the existence of other cultures. Criticism of it, though, is that—as was the case of the Grimm brothers—in compiling certain stories told by ladies in their living room and not villages as per the myth surrounding their narration and transcription, the stories were sometimes bent to suit the mores of the (newly-emerging) audience. Such reappropriation arguably causes stories to lose their meaning and most certainly their context, particularly if they are absorbed by the receiving culture and do not attract readers out of their living rooms to their sources.<sup>915</sup> An

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<sup>910</sup> Herder, *Materials*.

<sup>911</sup> Pupin, *Immigrant*, 27-8, 40, 94. “I thought of the multicolored uniforms loaded with shining decorations of the plumed hats and long sabres, and of the numerous glaring flags with imperial eagles displayed on such occasions in the Austrian Empire, and I told Bilharz that if that monkey business was all due to a profusion of artistic taste, then give me the simplicity of vulgar democracy,” 94.

<sup>912</sup> *Ibid.*, 41.

<sup>913</sup> Herder, *Outlines*, vol. I, 482.

<sup>914</sup> *Ibid.*, 483.

<sup>915</sup> This was the criticism of Deborah Root in *Cannibal Culture* (Boulder, CO: Westview Press, 1996). She argues that the otherness of other cultures is ravenously consumed by Western cultures as sensationalism or entertainment or a sales ploy, and as such only presents them to subsume them.

interesting aspect of Pupin's autobiography is that there is such a clear distinction between the cultures he writes about: seemingly not watered down at all.

By contrast, how are we to consider Goethe, whose *Italian Journals* written possibly a decade after his discovery of Serbian poetry in Switzerland, contain the observation: "I lost my subjectivity, but I found a world." He discovers, along his journeys, "the beautiful balance between the constraints of modern socialization and its benefits: between the meaning which will be lost in the prose of the world, and the meaning which will be found."<sup>916</sup> Goethe, of course, did find meaning in the prose of the world, but so did Pupin, albeit perhaps not as romantically and more pragmatically. To draw a very rough parallel, where Goethe invented a *Weltliteratur*, Pupin invented the concept of creative coordination operable through ideal democracy.

In Said's introduction to Auerbach's *Mimesis*, he writes that a characteristic of classical German culture is its "generosity of methodology", and attention to the minute, local detail of cultures and languages. To illustrate, he lists Goethe's interest in Islam and Persian poetry. Goethe's *Weltliteratur* views world literature as a symphonic whole, and part of a utopian vision of comparative literature as a cast synthesis of world literary production transcending borders of language without effacing their individuality and historical correctness.<sup>917</sup> Indeed, we shall see—and in fact, Said himself writes about—how "cultural" positions including those of the university can be diametrically opposed to the ruling politics (yet removed to where they have no real effect).<sup>918</sup> Ironically, then, as politics moved away from the ideals Pupin held, as seen in the newspaper correspondence of his son-in-law, and created the atmosphere that made Rilke uncomfortable in Paris, the situation in the academic institutions,<sup>919</sup> created in post-WWII, "an optimism with which one could enter into the inner life of a distant author or historical epoch with a healthy

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<sup>916</sup> Franco Moretti and Albert Sbragia, *The Way of the World: The bildungsroman in European culture* (New York and London: Verso, 2000), vii.

<sup>917</sup> Very contrary to the criticism of German culture as per Herder – whose cries seem to have been exported, most insidiously, via German-educated Lenin, who accused Empress Katarina of not being "Russian enough."

<sup>918</sup> Said, "Opponents."

<sup>919</sup> And the greater specialization and dissolution of the educational professional institution in which Auerbach had been trained.

awareness of one's limitations of perspective and insufficiency of knowledge."<sup>920</sup> Perhaps this is the promise, if only partly realized, in Goethe's vision to collect world and folk literature. And this is, again, very different from the tone at the end of Auerbach's book, where he admits that in studying literature representative of the historical world one is limited by the perspective of one's own time and work: "No more scientific a method of less subjective a gaze is possible, except that the great scholar can always buttress his vision with learning, dedication, and moral purpose."<sup>921</sup> Such humility is not characteristic of the jaded Theory that would follow, but more on that later, and for now, more on Goethe. To reiterate the point of this paragraph, it was Goethe's legacy that an attempt towards cultural sensitivity be made, and that the science in these views of human production be a recognition that there is not so much accuracy as there is a better-founded argument.

*Srbi i nemci*<sup>922</sup> specifically addresses the impact of Goethe's literary opus on German-ex-Yugoslav relations and Serbian culture. It was he, for instance, who encouraged Vuk, under the influence of the Grimm brothers, to collect three tomes of Serbian poetry, making him popular in Germany. It was precisely folk epics that generated an interest in Germany for the Balkans. As part of the *Sturm und Drang*, an interest in the folk was deeply connected to a movement to unite Germany. Herder has already been mentioned in this work as championing various folk identities, but it was he who collected the first volume of folk poems in the *Volkslied*. In 1766 he attempted to gather the poetry of all people, and it was at this time that the Germans were first introduced to the poetry of the Balkans.<sup>923</sup> The idea of collective, folk authorship was taken up by the Romantic movement.

First, let us examine some of the background of this Romantic approach to the Balkans, which also unfolded apart from Goethe's involvement. At the end of the 18<sup>th</sup> and beginning of the 19<sup>th</sup> century, Western Europe was interested in "unspoiled", "true" culture

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<sup>920</sup> Said, introduction.

<sup>921</sup> Ibid.,

<sup>922</sup> Gabriella Schubert, Zoran Konstantinović, Ulrich Zwiener Ulrich, eds., *Srbi i nemci* (Jena: Collegium Europaeum Jenense, 2003), a commemorative, special edition commemorating 821 years of German-Serbian diplomacy, of which there are unfortunately only 400 in print.

<sup>923</sup> Gabriella Schubert, "O recepciji srpske narodne poezije i beletristike u nemačko," in *Srbi i nemci*, 125.

that contained what they had long forgotten. Cyril Mango's paper entitled, "Byzantinism and Romantic Hellenism"<sup>924</sup> shows how myth functioned at the end of the Byzantine Empire from the 16<sup>th</sup> to 18<sup>th</sup> century, "beguiled by such fancies which were fed by a vast oracular literature, and effectively cushioned against the march of idealism in Western Europe ... the bulk of the Greek people retained their Byzantine identity right up to 1800 and even later." After that time, "a new myth, this time manufactured in Western Europe, was about to usurp the place of Byzantinism as the guiding ideal of the Greek people: it was the myth of romantic Hellenism ... everyone wanted to be a shepherd in Acardy." When the French Revolution broke out, "it was as if Greece and Rome had come back to life. No speech at the National Assembly was completed without reference to Sparta and Lycurgas ... it dawned on the public that there existed actual, live Greeks ... who were waiting breathlessly to regain their liberty ... What better cause than liberty, especially when it was the Greeks, the inventors, so to speak of liberty who were seeking it?" From the 1830's on, the Great Idea was incorporated within the Greek Kingdom of Constantinople and Turkish provinces with Greek inhabitants: out of Byzantine Orthodoxy emerged the naturalistic Great Idea. Its messianic nature blinded it to the consequences for Trebizond and Russian counteractions via Bulgaria. The attraction of the new myth projected onto Greece can be seen in the sub-themes of Rose Macaulay's *The Towers of Trebizond*:<sup>925</sup> though by then devoid of Greeks, the protagonist still searches for idyllic ruins and traces of the beloved culture.

But as Serbia does not share the same cultural legacy as Greece, and has a history, as we have seen of more oppression (by more oppressors) than freedom, a very different, less-idealistic approach was taken towards it. The Romantic reach, therefore, to Serbian culture was not as strong as that of the reach to the Balkan culture of Greece, but it is this juxtaposition that makes Pupin's autobiography so fascinating. We remember the central place the unspoiled idyll of ancient Greece appears in the character of Bilharz, a veritable Romantic Hellenist who even sang Homeric hymn, who influenced Pupin to take an arguably classical, and most certainly poetic, approach to science. But the themes of

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<sup>924</sup> Cyril Mango, "Byzantinism and Romantic Hellenism," *Journal of Warburg and Courtauld Institutes* 28, (1965): 29-43, accessed September 5, 2011, <http://www.jstor.org/stable/750662>.

<sup>925</sup> Rose Macaulay, *The Towers of Trebizond* (New York: New York Review of Books, 2003).

freedom are not raised in connection with Greece for Pupin, who considers Bilharz's Greek understanding of the notion of liberty as the views of a greenhorn, which we examined earlier. Pupin's Romantic notions of freedom are symbolized in the picture of Karadjordje on the wall of his natal home, and America as bearing the potential for the birth ground of an ideal democracy. The folk influences in his autobiography include the reference to the ballads being recounted in the first chapter, the references to folk dance, both Serbian and Highland, and the specific references to epic poetry interspersed throughout.

It was of course Serbian folk poetry that was taken up by *Weltliteratur* and the *Volkslied*. Arguably the most famous Serbian folk poem "Žalosna pjesanica plemenite Asan-Aginica" was translated into German in 1775 first by Swiss German Clemens Werther. It gained a larger reading audience through Herder's *Volkslied* in 1778 and 1779—after first appearing in Italian translation by Abate Alberto Fortis, "Canzone dolente della nobile sposa d'Asan Aga" in his *Viaggio in Dalmazia*, as well as in a German translation by Clemens Werther, which is considered the source where Goethe first encountered the poem during his travels to Switzerland where the translation appeared.<sup>926</sup> "Geteov prepev 'Hasanaginice' predstavljaju početak perioda intezivne duhovne i književne razmene izmedju Nemaca i Srba."<sup>927</sup> Responsible for this development were Goethe, Vuk Karadžić and his mentor Jerneja Kopitar, as well as Therese Albertine Luise von Jakob, who went by the pseudonym TALFJ. The latter produced the well-received *Volkslieder der Serben* published in 1825 and 1826, and again in 1833 and 1853 due to popular demand, dedicated to Goethe.<sup>928</sup> It was TALFJ's translation that served as a model for a series of later translators of Serbian folk epics.<sup>929</sup> This history is mentioned because it happens that Pupin's choice as a Serb to equate science with poetry has particular cultural significance.

A brief digression will help further the specifics about the spread of Serbian literature in German and further understand the significance of poetry as being of particular cultural import. Austrian court librarian Kopitar greatly influenced Karadžić, particularly

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<sup>926</sup> Schubert, "O recepciji," 128.

<sup>927</sup> Ibid.

<sup>928</sup> Ibid., 129

<sup>929</sup> Ibid., 131.



regarding Josephinism and Herder's idea that the collective consciousness of Slavs was determined by language.<sup>930</sup> Kopitar is important to mention in connection with Karadžić because it was he who translated and presented his *Pjesmaricu* to Goethe, and introduced Karadžić to important German literary figures. He further interested Grimm and Humboldt in Serbian poetry and Slavic themes.<sup>931</sup> When Karadžić began to collect Serbian poetry, he had the German precedents to use as his example: his having been published in Germany and Europe in turn served as a support.<sup>932</sup> Despite the fact that Kopitar's skillful promotion of Karadžić occurred when Romanticism and the concept of a simple literature and the language of its people was at its height, it is argued that Karadžić was less interested in these trends than he was to create a shared language for people who lived in the same region.<sup>933</sup> Therefore, despite the fact that Karadžić's work bore the stamp of Romanticism, his ultimate goal was to systematize the language in a way that rid it of its Church and old Slavic—used by the educated elite since the middle ages, and reform the language.

That said, it was on the basis of Karadžić's work that Goethe praised Serbia and Serbian 'representative' poems, which circulated in Weimar.<sup>934</sup> Those poems, in Goethe's translation, introduced to the Weimar court—"as numerous as Njegoš' Montenegro"—his translations of "Asan-Agica" and "Strahinjica-Bana".<sup>935</sup> Goethe is estimated second most important to the dissemination of Serbian literature in the West, second to Jacob Grimm, who took the pains to study Serbian, through Karadžić's grammar book, which he translated. It is argued that attention should be given to the fact that Pupin also made references to folk poetry in his autobiography, which although indirectly nonetheless exposed the Western audience once again to this literary source that has a legitimate place in the world literature anthologized in part by Grimm.

Grimm's critical reception of Serbian poetry can be found in the 1815 volume of Karadžić's. He addressed the rhyme, metaphors, Slavic antithesis, sound of the words, symbols, and imagery. He pointed to the "inherent" word play of the poems, which were

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<sup>930</sup> Gabriella Schubert and Mashek Mirko, "Vajmar-Jena i srpski nacionalni pokret," in *Srbi i nemci*, 177.

<sup>931</sup> *Ibid.*, 177.

<sup>932</sup> *Ibid.*

<sup>933</sup> *Ibid.*

<sup>934</sup> Milan Mojašević, "Goethe, istok i srbi na istoku," in *Srbi i Nemci*, 41.

<sup>935</sup> *Ibid.*, 41-2.

not mere games, but lent the words a deeper, hidden poetic meaning. He was particularly impressed by “Asan-Aginica”, comparing it with a bird flying to the heights, somersaulting there, before gently landing on its goal. Grimm was intrigued by the “genuine folk tone” of the Serbian poems, and “simple expressions” such as the *figurae etymologica* which led to full expression, both substantive and verbal. To describe the “native warmth” of the poetry, he drew parallels between the Serbian poems and Homer’s and Eddic poetry.

The strength of the poems reached Goethe who is said to have picked up two themes from “Asan-Aginica” in two of his own poems: the use of white and the description of nature in the introduction to “Klaggesang”—themes also found in his poem “Liebliches”.<sup>936</sup>

Other grammars and compilations of Serbian literature appeared at the time, including the works of Dositej Obradović. At this time, the language of the South Slavs, from Croatia through Bosnia and Herzegovina to Montenegro was referred to as *Illyrian*.<sup>937</sup> This changed definitively in 1918, when the language and literature was referred to as Yugoslavian. These were changes that took place during Pupin’s lifetime. One of the most compelling German translations of Serbian poetry from this period was that compiled by the social-democrat Hermann Wendel in *Aus der Welt der Sudslawen* (“From the World of the South Slavs”).<sup>938</sup> But arguably, the greatest impact in the Serbian-German Romantic cultural exchange was had by Goethe, particularly as he continues to remain a relevant figure, and through him, as through Pupin, pathways can be conceived for a way forward in today’s cultural and political dialogue. It is proposed here that the role of poetry introduced by Pupin through the progress of science be considered as a new way forward for this

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<sup>936</sup> Schubert, “O recepciji,” 132.

<sup>937</sup> Ibid., 134. Interestingly, Smith, Pupin’s son-in-law, also writes of the “Illyrian movement” which he describes as a literary union to develop language and literature in Austria-Hungary, C.U. Rare Books, M.S. 1035. But here we must stop to explain the complications arising from the very word “Illyria” and resulting misunderstandings. The Illyrians, viewed by the ancient Greeks as savages, but considered hardy fighters, are today considered to be ancient Albanians. Later, the name ‘Illyria’ was used in Roman and Byzantine times to refer to part of what is today’s Croatia. Thus, the Illyrian movement is geographic. Illyria, from the Renaissance on to the 19<sup>th</sup> century, is geographically contested as it has gone through so many hands. The complications of this geography may be illustrated through the problems of defining the background of an important scientist from the region, Roger Boskovich (1711-1787). He was born to an Italian mother and Bosnian father when Dubrovnik was part of the no-longer-existing Republic of Ragusa.

<sup>938</sup> Schubert, “O recepciji,” 136.

intercultural dialogue, but specifically in a way that points out the complexities of the past in terms of the reception of Serbian poetry by the West. In other words, it is argued that these Romantic beginnings take a scientific twist, even if all narrative is bound to the middle ground between myth and “reality”.

It is argued that the German politics of Goethe’s epoch took a great toll on culture—the effects of German militarism and politics were also felt by Serbia. As we have seen, this was an important theme in Pupin’s autobiography. Karadžić wrote that Jacob Grimm was the “wealth of the Serbian nation”—and it is argued that Goethe was as well.<sup>939</sup> In this respect, it has been noted that on the 100<sup>th</sup> anniversary celebration of Goethe, and despite internal affairs, the gathering was cosmopolitan: including Zagreb Germanists writing of Serbian Germanists, all writing of Serbo-Croat national poetry as “ours”.<sup>940</sup> In this way, it is possible to speak of a continued humanist tradition in the spirit of Herder, Goethe, and even Kopitar and Karadžić—yet it is also possible to speak of a continued tradition in empire building and oppression.<sup>941</sup>

In the 1830’s, when Karadžić’s translated poems were at the height of their success, Goethe’s compilation of world literature was reissued—which Miljan Mojašević explains is diametrical to the survey of world culture that appeared in the 31 December 1877 edition of *Ausland*. This ostensibly objective survey “excluding everyday politics” defined Europe as only West and Central Europe, and not “Slavic and Muhammadean East of our part of the world” because that part of the continent was “governed by extremely muddled opinions, devoid of every academic foundation, even in those bodies responsible for education”.<sup>942</sup> The notion of “confusion” or “muddled opinions” even entered Goethe’s dialogue on this part of the world. The notion of the “Slavic and Muhammadean East” remains muddled itself.<sup>943</sup> To a certain extent, it was through Kotina publications, like *Ausland*, that a vision of this part of the world as “confused” entered liberal thought. This, as opposed to visions of the even farther “East”—Persia, which sang through Goethe in his translations of the love poetry of Sufi poet Hafiz.

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<sup>939</sup> Mojašević, “Goethe,” 42.

<sup>940</sup> Ibid., 43.

<sup>941</sup> Ibid., 44-5. These themes were reflected in the press and various reviews.

<sup>942</sup> Ibid., 46.

<sup>943</sup> Ibid., 47.

This two-sided approach to Serbia can also be seen in the figure of Wilhelm Gerhard, who was so inspired by Goethe's Serbian poems that he learned Serbian from the "adventurist" Simeon Milutinović, and whose own translations of Serbian poetry appeared in the 1878 edition of *Ausland*, with the preface that, "In Germany, Wolfgang Stefanović Karadžić spread propaganda on Serbian nationalist culture for twenty years". The other side of the coin is not so much in mention of 'propaganda' as it is in Gerhard's next undertaking: a book dedicated to Bismarck, Germany as a world power, and rallying Germans to love their fatherland.

It is thus concluded that German appreciation of Serbian poetry has nothing to do with German or world politics. This is of course an elementary point, requiring little education: and is similar to Pupin's experience with the Germans he met when he first reached America, the political and petty rhetoric overcome in the ideals of literature are similarly overcome in the ideals of the American success man. Goethe's works are above being merely political and confessional, and "sasvim je srpski zagovarati ravnopravnost... sve postojeće zakone slične prirode koji ne podstiču mržnje i uništenja".<sup>944</sup> This idealistic humanitarian view is also illustrated by the distich written by Goethe and Schiller, lamenting a Germany they could not locate, "Deutschland? aber wo liegt es?", and declaring that culture begins where politics ends.<sup>945</sup> In this way, culture reclaims political claims, providing alternative ways forward, if Romantically.

### 5.3. Myths vs. Pupin's Interculturalism

Levi-Strauss writes of a "social fabric" in which individuals and groups are ordered through kinship activities, social organization, and social stratifications—either economic or

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<sup>944</sup> Mojašević, "Goethe," 54-55.

<sup>945</sup> Johann Wolfgang Goethe and Friedrich Schiller, *Xenien*, "95: Das Deutsche Reich," accessed October 8, 2012, [http://www.digbib.org/Friedrich\\_von\\_Schiller\\_1759/Xenien](http://www.digbib.org/Friedrich_von_Schiller_1759/Xenien). "Deutschland? aber wo liegt es? Ich weiß das Land nicht zu finden, Wo das gelehrte beginnt, hört das politische auf."

political. These orders interact on synchronic and diachronic levels.<sup>946</sup> Which is to say that aspects of man's existence can be teased out by looking around the man to levels, elements, and spheres of relevance. These elements are not only present in culture, but also in myth, wherein elements of the geographical, cosmological, integrative, sociological interact not only with each other—and interact back again with social life. By reading the myth back and forth with the culture, one may achieve a total explanation of the myth, understanding why the elements occur and what they mean. This means that if one is telling the story of a figure as complex as Pupin, who was multiculturally fluent and a polymath, the total picture involves more threads. This also seems to be true of many Serbian writers who emigrate: not always earning fame abroad equivalent to that they have at home, where they are often ultimately misunderstood, as we have seen.<sup>947</sup>

It is interesting to consider how Pupin was viewed by Velimirović, who is now a canonized saint in the Serbian Orthodox Church. Velimirović praises Pupin for being a Serb in bad times as well as in the good: at that time, the country received negative press when it was attacked by Bulgaria (a reality little-remembered today, together with related betrayal in WWI). But Pupin led a positive media campaign of his own, delivering lectures, writing newspaper articles, and meeting with President Wilson. Yet Velimirović also noted his American manner: when Pupin inquired about Ohrid, he asked: “But what’s most important about it?” Velimirović found that a typically direct American type of question. But for all that pragmatism, Pupin’s worldview was as Serbian as it was American in its *poesis*: the interlacing of the oral myths from his childhood within his narrative; priorities that are ideals, not materials (he came to America for education, not money); the hierarchical symbolic system that moves through a *noein* of affinities—cumulating in the life Pupin created by living according to those ideas.<sup>948</sup> But this is just one reading of Pupin.

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<sup>946</sup> Claude Levi-Strauss, “Social Structure,” in *Anthropology Today*, ed. Alfred Kroeber (Chicago: The University of Chicago Press, 1966), 524-53.

<sup>947</sup> See Sael and also Velimirović, “O Mihajlu.” The latter writes of the vulgar attacks made on Pupin by a Yugoslav-American paper, calling Pupin “najveći izrod,” to which he responds with the Biblical phrase, “Niko nije prorok u rodu svome.”

<sup>948</sup> Here the definition of *poesis* is that in Plato’s *Timaeus*.

Let us take issue with another reading. Vladimir Pištalo, known in America as a university professor, and in Serbia for his novel based on the life of Nikola Tesla, wrote about Pupin in “The ‘Crossings’...”, claiming that “one gets the impression that he tried to resolve the dilemma of his dual allegiances by convincing himself that the two sorts of values, Serbian and American ones, were essentially the same”.<sup>949</sup> That Pupin assigned his experience of different hierarchies along the same system of values does not have to mean that aspects of his experience were the same, rather, they belong to the same system of ideal values (virtue versus vice, etc). While he did wish for Serbia to be more democratic, this was explicitly explained as a method that would free Serbia from Austria-Hungarian hegemony.<sup>950</sup> It would be very hard to say what his views would be in today’s world, and whether he would adopt a view to export democracy in a climate where this export is often achieved through a use of force similar to that he criticized Austria for (along the lines of Tacitus’ critique of tyranny cited by Herder).

Furthermore, Pupin’s descriptions of America and Serbia differ in his autobiography on the basis of description alone, one would be hard pressed to say that Pupin viewed them in the same way. America had no bagpipe player playing on the eve before his marriage; it had no hearth populated by elders, no intensely pastoral scenes. Serbia had no fast-paced exposure to ideas; no access to technology (news of his telephone achievements reach him by horse while he was visiting Idvor), no place or jobs for a rebellious and intelligent youth. The particular devotion he had for his mother alone is culture-specific in the 20<sup>th</sup> century, and that he was never ashamed of his background further reveals his dual identity. That he learned to play the game in America does not replace his affinity for Serbia. In fact, to lecture about Serbia as he did at that time was brave and unusual for a successful Serb emigrant of any time: it is risky in American high society to be different, and this risk is intimated throughout his autobiography: through the illustration of cane rush at Columbia (where he was mistaken for a Turk),<sup>951</sup> or his initial reception in Connecticut, for example. Pupin was taken to task for his difference (and lack of extremely fine tact) in the *New York Times* review of his book as we saw earlier. That

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<sup>949</sup> Vladimir Pištalo, “The ‘Crossings’ in Kafka’s *Amerika* and Three Serbian Immigrant Memoirs,” 247, accessed September 5, 2011, <http://www.serbianstudies.org/pdf/15.2%20PDFs/03.Pistalo.pr.229-56.pdf>.

<sup>950</sup> Pupin, *Immigrant*, 161-2.

<sup>951</sup> *Ibid.*, 115.

Pupin saw similarities between things does not mean that he thought of them as being the same: rather, if one is trying to introduce disparate themes to an average audience, one is most likely to start with comparisons between the new subject and familiar ones. This is also how he lectured about science. If Pupin thought of America and Serbia as being the same, it would not be possible to get a picture of Serbia as distinct from America in his autobiography—but he succeeds in this. Crnjanski, after all, recognized in his book review the distinctly Serbian descriptions of his hometown.

Amartya Sen, the Nobel Prize winner, writes of the viciousness of single identity politics. In many ways, Sen is like Pupin in that he lived in Bengal before it was part of India: Pupin in Idvor before it was part of Serbia; Sen attended Tagore's school which cultivated the national arts: Pupin was exposed to Slavic national movements; Sen went on to study at Trinity College, i.e. in a country that could be viewed as hegemonic: Pupin studied at Cambridge and in Berlin. Sen would know, like Pupin, what it is to retain characteristics of one's birthplace, and ennobling them through exposure to a culture controlling the master narrative. Single identity politics are complex, particularly if they are enforced by people who were yesterday enslaved (culturally, politically, etc). How many novels have dealt with ex-slave mentality: wherein the slaves are worse masters than those who once mastered them? It is possible to see a trace of single identity politics in Pištalo's reading of Pupin. As Velimirović wrote of Pupin: he was the greatest patriot, though not always accepted in his own country. Though Pupin does not mention it in his autobiography, he sent huge sums of money to Serbia—to its libraries, schools, churches. What is more, his vision for Serbia was diametric to his vision for America: he considered that if California could prosper on the sale of but citrus fruit, Serbia with its superior tasting cornucopia of fruit should devote itself to agriculture, and leave technology to the West.<sup>952</sup> To this end, as we have already seen, he proposed an experimental agricultural school be erected in Idvor, and sent money to this end: he said he could not lecture the government on how to run the country but was certain when they saw the success of his school and his vision, they would create such schools everywhere. The school would have trees the children would plant in the courtyard, and during the winter months, advantage would be

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<sup>952</sup> Živojinović, *Nacionalni*, 159-80.

taken of advances in film, and the children would be shown agricultural films of advances made in farming techniques.<sup>953</sup> These examples should be made part of the popular myth surrounding Pupin, if an academic work is allowed to tease out certain strands that could be woven back into life through example.

Perhaps Pupin becomes a flattened myth for some due to the fact that ours is an increasingly jaded age, ever distant from poetic idealisms and the cross-fertilization they imply. We have seen how Goethe was poet, idealist, and also scientist; in previous chapters, we saw how scientists were also poets or more generally speaking writers. Prior to the age we are considering, Giambattista Vico wrote in the 18<sup>th</sup> century rather prophetically, in *De Italorum Sapientia*, that to introduce geometrical method into practical life is like trying to go mad with the rules of reason, attempting to proceed by a straight line among the tortuosities of life, as though human affairs were not ruled by capriciousness, temerity, opportunity, and chance. He warned his age and those stemming from it of the danger of seeking truth in clear, distinctive ideas, blinding us to the true depth of life, yet also warns of the other extremes, citing the classical art of moderating the course of human things so that liberty is not replaced by the tyranny of the senses. Pupin seems to have tempered his extremes in part through his interculturalism, which allowed him to refine his views from the perspectives of the various countries he lived in, such as absorbing the complexity of the Highland spirit, or German pragmatism.<sup>954</sup>

But perhaps the most important illustration of Pupin's interculturalism is where he himself explains the *necessity* of returning home if one is an immigrant, both to assist memory and the development of certain ideas: "stirring up is experienced by many American citizens of foreign birth whenever they visit their native land. Every one of these visits speeds up the Americanization process which is going on in them. I firmly believe that the amalgamation of the foreign-born would be speeded up wonderfully if we could make it obligatory that every foreign-born American citizen should revisit his native land at stated intervals of time. Had I not visited my native land so many times ... the memory of my early experiences in America ... would probably have faded away

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<sup>953</sup> Živojinović, *Nacionalni*, 159-80.

<sup>954</sup> Pupin, *Immigrant*, 341.



completely long ago. Had I not visited Belgrade and Panchevo in 1919 I should not have been stirred up on the subject of American idealism, and particularly about the American idealism in science.”<sup>955</sup>

Thence the lesson in Pupin’s complex identity politics: a living connection is to be established between past and present, one shore and another. His life illustrates certain paradoxes, such as experiencing antagonism from home, yet not abandoning it; rallying behind science, but not at all costs or in all contexts. Arguably, where logic fails to help us understand the paradoxes, creative poetry forges bridges of understanding—so we shall take liberties in the next chapter by attempting to begin with a poetic chapter heading.

### **5.3.1. The prince, goose, and the matriarch**

A biography is a compromise among distinct world views: its author becomes a form of cultural mediator. “Better the illusions of subjectivity than the impostures of objectivity,” Barthes wrote towards end of his life.<sup>956</sup> Perhaps the only semblance of objectivity is in single identity politics, which can be pinned down. Otherwise, we are left with “illusions of subjectivity” that are essentially Romantic: e.g. in his views on science but also of his home country,

In his autobiography, Pupin describes approaching Belgrade during one of his trips home by boat and how the city rose, “like a Gibraltar above the waters of the Danube [and looked] anxiously across the endless plains of Austria-Hungary, which... seemed to threaten to swallow it up... Belgrade looked to me as if its proud head would touch the stars. The history of the long-suffering Serb race was grouped around it, and that lifted it up in my imagination to sublime heights.”<sup>957</sup>

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<sup>955</sup> Pupin, *Immigrant*, 318.

<sup>956</sup> Qtd. in Sylvere, “Barthes.”

<sup>957</sup> Pupin, *Immigrant*, 152.

His generalizations extend further, beyond describing the symbolism of the landscape, to summing up the pathos of its people. In a newspaper article, he writes, “The Serb is imaginative, fond of his national music, poetry and of his national costumes and noting in the world can prevent him from indulging in the sweet dreams of the Serbian minstrel who sand of the return of the Serbian glories of the 14<sup>th</sup> century.”<sup>958</sup> He further describes in his autobiography his “dismembered nation united in tears” that would quench “the thirsty soil which nourished the roots of Serb nationalism. A nation which is united in song and in tears will never lose its unity.”<sup>959</sup> (Though he also adds that when love for a country dies, the country must die also.)<sup>960</sup> By contrast, Vienna and Budapest both lacked “the perceptions of subtle psychology”,<sup>961</sup> which in some ways forms an interesting possible explanation of Herder’s prediction that Slavs would again rule the lands they occupy. This tenuous point can nonetheless be developed and supported by contemporary scholarship, as Kristeva’s cure for the ailing cultural memory of Europe is for it to learn from its more reflectively complex Eastern countries.<sup>962</sup> If not agreed with, it is at least conceivable how this East could become the symbol of complexity that could be worn as medicinal charm by the West, the way some scholars posit the letters abracadabra were worn in an amulet by the ailing.<sup>963</sup> It is posited those letters once meant, “I create as I speak” which gives credence to Burke’s *crede ut inteligas*: we may choose the myths that inform our lives.

Pupin’s Serbia and America retain equal importance even after various trials: one not mentioned thus far was when a simple farmwoman expected him in his early days to “drop Serbian notions” and become an American. Many lesser characters would under such pressure pick one or the other. On the contrary, Pupin explains that it was respect for the traditions of his own people that prepared him to respect the traditions of the country to

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<sup>958</sup> *Crescent Sun*, July 30, 1914, 4.

<sup>959</sup> Pupin, *Immigrant*, 155. Perhaps he was right: the song, like many ancient myths, is being lost in the apoetic age of technology.

<sup>960</sup> *Ibid.*, 9-10.

<sup>961</sup> *Ibid.*, 156.

<sup>962</sup> Kristeva, *Crisis*.

<sup>963</sup> Historian Judith Weingarten confirms that abracadabra was a Semitic magical invocation and appeared in a Latin medical poem, but is not certain whether it means “I will create as I speak”.

which he emigrated.<sup>964</sup> Pupin had a deep respect for traditions which, as we have seen, are referenced and even compared throughout his autobiography. For example, he compares the epic he learned from Idvor elder Baba Batikin, of Prince Marko, with what he learned of American history, like Lincoln.<sup>965</sup> This reverence was learned from the Idvor community and elders. He writes that Idvor residents would resent a stranger “not in tune with their traditions”.<sup>966</sup>

He also indirectly attributes his humility to something he learned from the village of his birth. As mentioned earlier, his “rich learning and ... academic honors” carried “with them an air which did not harmonize with the old-fashioned notions of Idvor”.<sup>967</sup> He learned from his mother’s criticism on one of his trips home from his advanced studies that he “looked so learned and far above us plain folks of Idvor that nobody would recognize” him—and took this criticism to heart.<sup>968</sup> He regained their trust by observing the local customs: kissing the hands of elders, kissing youngsters’ cheeks, deferring to the oldest male in the family, and so on.<sup>969</sup> Through his return to the Serbian customs and socializing with the peasants of Idvor, he realized that his education had, “sown some seeds of vanity and false pride in my heart. But these seeds were smothered by the inexorable rigors of Idvor’s traditions. Humility is the cardinal virtue in a youth among the peasants of Idvor.”<sup>970</sup> Here, we may wonder if his ‘classicism’ was not actually ‘Serbian’. Through the comparisons he was able to make through his sensitivity for affinities, it is difficult to tell which influences were dominant in the creation of his character.

But his respect for village life does not stop there and extend beyond love-of-motherland into the domain from which Rilke and other intellectuals sought the wisdom of the Slavic peasant (we shall see that Rilke traveled to Russia in search of this with Lou Andreas-Salomé). Pupin writes, “There were other great questions of human life, the answers to which can perhaps be found in Idvor without a knowledge of Maxwell’s

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<sup>964</sup> Pupin, *Immigrant*, 104-105.

<sup>965</sup> *Ibid.*, 8-9.

<sup>966</sup> *Ibid.*, 104.

<sup>967</sup> *Ibid.*, 159.

<sup>968</sup> *Ibid.*

<sup>969</sup> *Ibid.*

<sup>970</sup> *Ibid.*, 160.

electrical theory.”<sup>971</sup> He considered that the peasants knew more than the answer to metaphysical, cultural, or artistic problems. He supposes that “it is quite remarkable that Serb peasants should have been cognizant of a physical principle which was probably unknown to English and French savants, like Vaschy and Heaviside” when considering sound vibration.<sup>972</sup> Science lies outside the walls of academia in Pupin’s world, in which he writes that he learned about the nature of sound as a cowherd.

And yet he acknowledges the difficulty of catching up on knowledge or adapting to Cambridge university life, in which he sums up his confusion in a Serbian phrase: like a goose in a fog.<sup>973</sup> He uses the phrase many times, the first time deciding that his experience as such a goose had its precedence on his arrival in America and the last time in conversation with Tyndall who discovers through this reference that Pupin is a Serb. The saying rounds out his experience and represents his original cultural identity but also serves to show how far he came: for when he tells the story, he is no longer that goose and so removed from that fog that he is visible to all as a veritable star, himself.

We remember the significance of stellar metaphors to the autobiography, in which Pupin’s mother plays a central role, even and especially in connection with science, as demonstrated by the fact that he said it was she who first connected stars to scientists. He also recounts his mother’s story about the eternal truth.<sup>974</sup> In this story, she explains that she goes to church to see the icons to remind her of the saints’ virtuous work, which leads her to communication with God. She says, “Cambridge is a great temple consecrated to the *eternal truth*: it is filled with icons of the great saints of science. The contemplation of their saintly work will enable you to communicate with the spirit of *eternal truth*.”<sup>975</sup> Along these lines, he later indicates “pictures” that illustrated “what Maxwell meant”, of which “their highest meaning... was the recognition that the truth which they conveyed was a part only of what my mother called the ‘Eternal truth.’”<sup>976</sup> He continued to apply her symbolic hierarchy throughout his descriptions of his later life, referring to it in various contexts, like

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<sup>971</sup> Pupin, *Immigrant*, 166.

<sup>972</sup> *Ibid.*, 334.

<sup>973</sup> *Ibid.*, 171, 178, 187, 208-9.

<sup>974</sup> *Ibid.*, 190-1, 321.

<sup>975</sup> *Ibid.*, 191.

<sup>976</sup> *Ibid.*, 194.

as support for Andrew White's plea for science<sup>977</sup> and the tripos,<sup>978</sup> and he writes that his, "increased knowledge did not change essentially the coordinates of my boyhood emotions and the divine bond between the creative consciousness and the Creator."<sup>979</sup> But it was his mother's religion that "taught her how to catch the spirit of science, and I was always certain that science can teach us how to catch the spirit of her religion."<sup>980</sup> From the icon on the wall of the house Pupin was born in to the icons in church that Pupin's mother explain can be connected to science, to science enabling man to come closer to the language of God, this set of symbols spell out an iconic augmentation, as explained in an earlier chapter—and yet, is at once an iconic augmentation stemming from a deeply local image, that of the icon, which appears in Eastern European countries.

It would be possible to draw interesting parallels between Pupin's written work and the novels and poetry of Laza Lazarević, Svetozar Marković, and Vojislav Ilić, to seek more local symbols. Mostly, the former—if for the reason than he had also attended some of Helmholtz's lectures. But Lazarević also idealized the patriarchal world, which forms an interesting juxtaposition to the image of the Serbian matriarch in Pupin's autobiography. Unlike Milovan Glišić, who focused on social crises, Lazarević—like the classicist in Pupin, focuses on moral crises. His more memorable literary images also, like Pupin's, center around the icon—in Lazarević, the school icon. He paints the picture of an idyllic, patriarchal village, set in contrast to the spiritual disquiet of schooled individuals educated abroad, torn by their inclination towards individual freedom and the strict demands of patriarchal and moral loss in the old societal structure that worried about each individual within the constraints of the fold.

Pupin brings the idyll of the village into his autobiography—and quite literally, it is what he picked up as a cowherd that he claims formed the basis for some of his later scientific discoveries. The icon, in Pupin's writing, becomes a metaphor for higher learning in pursuit of God's language. The village becomes his moral school, the lessons of which he passes down to posterity as still being very much alive at least while he himself was

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<sup>977</sup> Pupin, *Immigrant*, 378.

<sup>978</sup> *Ibid.*, 78. Pupin compares the "star" of the tripos to a "tin star" when he recalled his mother's story: absent from the tripos were the poetical element of dynamics.

<sup>979</sup> Pupin, "Creative Coordination."

<sup>980</sup> Pupin, *Immigrant*, 246.

alive. He learns not to be too proud of his learning and reveals that even for the world-class intellectual, a shepherd's pipe-playing can still be deeply thought-provoking. But Pupin's Serbia is removed from the reality of the moneylenders Lazarević was so critical of, and perhaps it is elements such as this—missing as they are from Pupin's autobiography—that make it so notably an idealist narrative.

Capital also enters into Marković's narratives with particular emphasis, as his novels focus on the social and political, such as in *Sbrija na istoku*, 1872. The land, once "seljačko patriarhalna" with many "zadrugama" and ruled by idyllic social relations, is faced with bureaucratic-capitalist states and modern methods of production as well as new economic and social relations which founded "novčano gazdinstvo i čiftinski moral".<sup>981</sup> All three authors share an idyllic vision of the past, which to some Serbs today has become a myth.

Vojislav Ilić, though a poet, is worth mentioning here in terms of the fact that while he was not a Romantic, he, like Pupin through Bilharz's influence, was interested in the past, including that of other nations, as well as myths and ancient cults. We shall see below further examples of broad-minded Serbian scientist authors that may be compared with Pupin.

Pupin's autobiography leaves us with the indelible imprint of an epic that is not lost overseas, a mother who ensures the essential is not lost in translation, and a goose that comes out of the fog into stardom. It may sound like a myth more than scientific account and comparable only to those Serbian works that sought to idealise the homeland, hence the section below for purposes of further comparison.

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<sup>981</sup> Qtd. in Deretić, „Realizam“, *Kratka Istorija*.

### 5.3.2. A few stories of self by scientists from America and Serbia

Interested in the homeland and a scientist like Pupin is Jovan Cvijić, who also wrote an autobiography, *Iz uspomena i život*; Cvijić further happens to have worked alongside Pupin at the Paris Peace Conference to determine the borders of the future Kingdom of Serbs, Croats, and Slovenians. Like Pupin, Cvijić attributes his mother with having contributed to his upbringing; though his mother, like Pupin's, was illiterate, she had a profound respect for education, which Cvijić considers to be remainders or traces of an older Serbian civilization preserved in this way.<sup>982</sup> Icons also play a role in Cvijić's narrative: such as where his mother first prays to the icon of the Mother of God in the forest that was reached before reaching the monastery where they would go sometimes.<sup>983</sup>

He, like Mihailo Petrović, too, as we shall see, not to mention Milanković or even most of their international peers, valued the importance of a broad education, which he saw as guidance for his personal life. One example is his description of literature: how he took to Njegoš and how, as a schoolboy, he did not know that he should turn to literature to find answers to life's greater, existential problems.<sup>984</sup>

It is also worth mentioning that his autobiography, like Pupin's, first appeared in a periodical, *Nova vojvodina*. The new in the title is indicative. Cvijić's assessment of socialism, was not so favourable when it came to literature, which he writes was not promoted and so led to a kind of cultural dearth.<sup>985</sup> This theme separates his autobiography from Pupin's. It is significant that Cvijić wrote his autobiography in a country Pupin only remembers: the literary horizon was not quite the same. We have already seen Deretić's assessment that it was only in the last century that prominent Serbian thinkers could come to fruition in their home country. To add brief historical depth to this assessment, we may consider Stojan Novaković's *Srpska Knjiga: Njeni prodavci i čitaoci*, in which he not only looks, in 1900, to beyond the country for inspiration as to how to develop his country's

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<sup>982</sup> Jovan Cvijić, *Autobiografija i drugi spisi* (Beograd: Srpska književna zadruga, 1965), 36.

<sup>983</sup> Ibid., 33.

<sup>984</sup> Ibid., 56.

<sup>985</sup> Ibid., 43: "Socijalistička lektira razvila je odvratnost prema lepoj književnosti, naročito prema stihovima. Tek sam se docnije poč vraćati našoj boljoj beletristici". For the dearth, see *ibid.*, 52.

literature and readership, but also concedes that it is a time of growth for Serbian literature, a time requiring methodical and continuous work.<sup>986</sup> Of course, the mere existence of writers like Novaković and those that followed have changed the picture, and the outline given here is most rudimentary.

While Pupin and Cvijić's autobiographies are similar to the "core," to borrow a word we shall come to, what with Cvijić concerned with moral education<sup>987</sup> and developing the theme of the importance of adhering to benevolent influences,<sup>988</sup> a difference in their books is in their position towards the genre of autobiography. Pupin's is far more literary, with even citations of poetry and anecdotes woven in, while Cvijić's from the very beginning asserts that the task of the autobiographer is difficult given the problem of accuracy, which contends with memory and objectivity, and he writes that he is uncertain as to his ability to be veracious and thereby asks readers to be forgiving. Specifically, he wonders at whether a person can separate the telling of early events as they really were without letting them be coloured by later ones: he sees the task of the autobiographer in this quandary.<sup>989</sup> In this concern of his, we see the extent of his scientific approach to other areas of life.

With this in mind, we may consider Mihailo Petrović "Alas"—who gained the latter epithet for his love of fishing. A mathematician and inventor by profession, his most famous literary work is called *Metaphors and Allegories*,<sup>990</sup> but a less well known book of his, *La Mécanique des Phénomènes fondée sur les Analogies*,<sup>991</sup> does what Pupin praises Hunt and Tyndall for: bringing poetry to science. He argues in those works that certain phenomena can share associations with others with which they have no direct or

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<sup>986</sup> Stojan Novaković, *Srpska Knjiga: njeni prodavci i čitaoci* (Beograd: Državna štamparije kraljevine Srbije), 97, 101. At the latter, he writes: "I srpsko knjižarstvo nije rana laka ni jučerašnjam niti se može izlečiti jednim mahom i za dan. Samo rad smišljenm postupan, i metodičan može i toj sroskoj rani leka naći. Of course, the mere existence of writers like Novaković and those that followed have changed the picture, and the outline given here is most rudimentary."

<sup>987</sup> Cvijić, *Autobiografija*, 52.

<sup>988</sup> Ibid., e.g., 46 and 52: as in when he writes of the difficult company he fended with in Belgrade, remembering his mother's protection of his study possibly by not letting anyone into his room while he worked, or when he writes that the spirit of a subject taught should be conveyed in a way to influence students.

<sup>989</sup> Ibid., 29.

<sup>990</sup> Mihailo Petrović, *Metafore i alegorija* (Beograd: Zavod za udjbenije i nastavna sredstva, 1997).

<sup>991</sup> Mihailo Petrović, *La Mécanique des Phénomènes fondée sur les Analogies* (Paris:Gauthier-Villars, 1906).



immediately apparent connection. He compared linguistic and scientific discovery, seeing their essence as being the same. Pupin also united science and art and other activities in his vision of creative coordination.

In addition to scientific works, Petrović wrote short memoirs, and in one of particular relevance here, he explains the breadth of the education that students received during his lifetime. In “Gimnazijske uspomene” he writes that students would graduate who could, “izneti dosta široka i temeljna znanja”.<sup>992</sup> This thought corresponds with one of the definitions of Victorianism given earlier as well as with Pupin’s views whose value of breadth is seen in his all-encompassing metaphorical hierarchy, which, for example, values artists as much as scientists, explaining their worth in each others’ terms.<sup>993</sup> Incidentally, Petrović in commenting on how a broad education is no longer possible given the larger number of students per class, remarked, “ono što je dobro za Dansku ne mora biti dobro i za Domanovićevu zemlju Stradiju.”<sup>994</sup>

Petrović reflects breadth himself in *Metaphors and Allegories*, which begins with breadth as its premise, namely, in the idea that the power of these linguistic tools can link disparate concepts or things. “Metafora je retorička figura kojom se značenje jedne reči prenosi na drugu jednu reč sa kojom prva ima samo toliko veze što se, prema onome što se ima u vidu, pod ovom drugom ima podrazumevati prva; alegorija je jedna fikcija kakve bilo vrste koja u svesti ima da izazove predstavu druge neke pojave, a ne one koju neposrednu izražava.”<sup>995</sup> With this as his thesis, he proceeds to analyse, in mathematical fashion (his famous, “fact (S) says ... that group (F) of shared facts”) various usages of metaphor and allegory, as well as typologies. But this work, as opposed to *La Mécanique*, does not betray his interest in the linguistic subject. The answer to this can be found in his essay, “Jedna zajednička crta nauke i poezije”.<sup>996</sup> This short work not only shows some essential

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<sup>992</sup> Petrović, *Metafore*, 205.

<sup>993</sup> Pupin, *Immigrant*, 378: “Remember also that what I have just described is not merely a flowery figure of speech, but that it is a concise description of a beautiful physical relationship, which science has discovered in the life of the rose.” For the opposite, see *ibid.*, 379.

<sup>994</sup> Petrović, *Metafore*, 205.

<sup>995</sup> *Ibid.*, 12.

<sup>996</sup> *Ibid.*, 146-50.

similarities between his thinking and Pupin's, but also offers terms through which Pupin's autobiography might be better understood.

Essentially, he writes that real poetry and true science not only share some similarities but have shared features that scratch far below the surface. It is in fact difficult to distinguish poetry from science in that they both seek to discover and make use of similarities among disparate elements and facts. He is interested in the "core" of things; the specified group of facts that although disparate to another group can, through the discovery of their commonalities, pervade those similarities through to all they contain within the group, as demonstrated by the theory of types, wherein all phenomena are enveloped by the core of similarities. This idea can be taken to explain Pupin's metaphorical, stellar hierarchy. The star at the top, through mimesis and its core of light, guides man below to higher endeavours that only become apparent when man has learned to, through a series of metaphors beginning in the visible, recognize more latent values and see their continuation and flow.

Petrović writes that deeper similarities that succeed in clarifying the core are powerful tools in the discovery of new truths: for without noticing similarities with something known, the new thing would remain unseen or at least relegated to coincidence. The ultimate goal of this way of looking at things complies with what we saw in Maxwell and Faraday earlier: that endless complications and colourful pictures are made into a simpler picture of essentials. Pupin, too, prized the "simple language" of beautiful science.<sup>997</sup> Petrović sees the essence of things as simple, but writes that poets dress up this simplicity in order for it to look impressive. His take on poet-scientists, like Félix Alexandre Le Dantec in his *La Lutte Universelle*, is that they may discover truths that science, on its own, may take far longer to discover. He cites the example of Lucretius, who discovered the interdependency of time and space long before Einstein, who we will come to. Petrović concludes that science and poetry meet in their search for the core of things, but go their separate ways where poetry seeks beauty, and science, truth. Of course, for Pupin, beauty and truth are aligned, and ultimately, the core of all true things is to be coordinated into a beautiful whole.

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<sup>997</sup> Pupin, *Immigrant*, 330.

It is important to note that Petrović can claim a place for himself in the pantheon of Serbian literature. Literary critic Jovan Skerlić attributed the introduction of a precise, concise, elevated simplicity to Serbian literature to Petrović, which he sums up as a “scientific style”.<sup>998</sup>

Skerlić considers that Cvijić also introduced this style to Serbian literature: at once factual and popular.<sup>999</sup> (Though we may also remember that Cvijić wrote a short piece on Skerlić, in which he praises the young scholar as having possessed both a necessary courage both in political stance and action and also modesty.)<sup>1000</sup> Through the details of the description in the writing of Cvijić and Petrović, they can be compared to that of the scientists lauded by Davenport earlier: scientists whose work can be read as prose, at least by professors and students who are not “delinquent”. In other words, the “terminological screen” used by these thinkers is foremost one of observation, and only secondarily one of discipline or field.

But even with such a broad approach to scientists who write, it is still hard to place Nikola Tesla, who also wrote an autobiography, *My Inventions*. In this book, it is Tesla’s father who seems to be the dominant parent, represented by Tesla as being strict though nonetheless supportive.<sup>1001</sup> Tesla does, however, tribute his mother with his creativeness—but does not spend much time in his book discussing her except to mention that she passed down to him creativity and that she taught him about God.<sup>1002</sup> Neither God nor even ethics, as a social, more earthly reflection of harmony, form the golden thread of his narrative as they do in Pupin’s: the difference being the point to which Pupin repeatedly wove these themes into his narrative.

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<sup>998</sup> Dragan Trifunović, *Legende Beogradskog univerziteta*, (Beograd: Biblioteka Svetozar Marković, 2003), 59, accessed February 18, 2011, <http://www.rastko.rs/cms/files/books/46b8ab58e74e1.pdf>.

<sup>999</sup> Ibid.

<sup>1000</sup> Cvijić, *Autobiografija*, 363-4.

<sup>1001</sup> Tesla, Nikola, *My Inventions*, accessed on September 10, 2010, <https://archive.org/details/MyInventionsTheAutobiographyOfNikolaTesla>. His father, though “dear” was “inflexible” and mortifies Tesla when he does not praise his academic honours. Essentially, Tesla’s father appears strict out of love: the library is locked when Tesla is a child, but only to save Tesla’s eyesight; that Tesla’s grades and honours are not greeted as Tesla hopes is because his father worries over his health.

<sup>1002</sup> Ibid., “The gift of mental power comes from God, Divine Being, and if we concentrate our minds on that truth, we become in tune with this great power. My Mother had taught me to seek all truth in the Bible; therefore I devoted the next few months to the study of this work.”

Like Pupin's autobiography, Tesla's addresses war and humanity and how to improve things for man. At one point Tesla does mention God without God being in connection with his mother,<sup>1003</sup> and proclaims the same message that Pupin finishes with in his autobiography, that America ought to harmonise with God's will.<sup>1004</sup> However, Tesla does not end his autobiography on the idea of the betterment of the human being but on the idea of the perfection of technology, which must work "against interruption."<sup>1005</sup> He is apparently more flexible than Pupin in envisioning an ideal: "We all must have an ideal to govern our conduct and insure contentment, but it is immaterial whether it be one of creed, art, science, or anything else, so long as it fulfills the function of a dematerializing force."<sup>1006</sup>

That assertion, together with his earlier assessment of the self being an automated entity that can be controlled through thought-exercises of self restraint, makes his tone sound a lot more like Bertrand Russell's than Pupin's. Russell, for example, takes a similar approach to self in *The Conquest of Happiness*,<sup>1007</sup> where he writes about getting into the right habits, and consistent observation of self—different in tone to Pupin's stories of the pursuit of knowledge, such as his pilgrimage to Scotland to better understand Maxwell, and being led astray to learn the Highland dance as he nonetheless made his way through his reading.<sup>1008</sup> That such stories of his had a didactic value that was recognized is demonstrated by the fact that his autobiography was recommended for school use. Therefore, it is not that Pupin differs from Russell and Tesla because he is not committed to learning but because he did not attempt to scientifically distance himself from experience

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<sup>1003</sup> Tesla, *Inventions*, "Peace can only come as a natural consequence of universal enlightenment and merging of races, and we are still far from this blissful realization, because few indeed, will admit the reality 'that God made man in His image', in which case all earth men are alike."

<sup>1004</sup> Ibid., "I am filled with conviction that the interests of humanity would be best served if the United States remained true to its traditions, true to God whom it pretends to believe, and kept out of 'entangling alliances.'"

<sup>1005</sup> Ibid., "Any city, at a distance, whatsoever, from the enemy, can be destroyed by him and no power on earth can stop him from doing so. If we want to avert an impending calamity and a state of things which may transform the globe into an inferno, we should push the development of flying machines and wireless transmission of energy without an instant's delay and with all the power and resources of the nation."

<sup>1006</sup> Tesla, *Inventions*.

<sup>1007</sup> Bertrand Russell, *The Conquest of Happiness* (London: George Allen & Unwin Ltd., 1932), accessed November 12, 2011, <https://archive.org/stream/TheConquestOfHappiness/TheConquestOfHappiness-BertrandRussell#page/n5/mode/2up>.

<sup>1008</sup> Pupin, *Immigrant*, 212-14.

but brought himself to science. Tesla writes of himself in the tone of an experiment, only seeking to engage in the exercise of writing insofar as his experiences are of “interest to students of psychology and physiology.”<sup>1009</sup> This resembles Russell’s tone when he recounts past failures, like his early fear of public speaking that he mentions in “How I Write.”<sup>1010</sup> he recounts them only to help others overcome them as well.

Where Pupin constructs a narrative on the symbolism of stars and icons, Tesla’s narrative privileges instinct as trumping knowledge. It is interesting that instinct or inspiration based ideas come up far more in the literature of these Serbian scientists than their more Western counterparts: Cvijić writes about superstition,<sup>1011</sup> Petrović about inspiration,<sup>1012</sup> and Tesla, intuition.<sup>1013</sup> Though less symbolic than Pupin’s autobiographical narrative, Tesla’s is also less humble, though this point is rather interesting in view of the lasting supremacy of his inventions. He writes that he can “rest on [his] laurels”.<sup>1014</sup>

Cvijić proposes that the success of autobiographical narrative, near impossible to achieve because of lack of uncoloured memory, can perhaps at least be achieved through good taste.<sup>1015</sup> If it is tasteless to boast if one is incapable of worthy action, Tesla’s narrative is tasteful because his achievements supported his words. But an interesting cross-section is reached when one autobiography overlaps with another, or at least another autobiographer.

Thomas Edison, whose writing is hardly as eloquent as the other scientists listed here, may be worth including considering his connection with Tesla and Pupin, just as Petronijević is connected to Russell. Edison kept a diary that is rather colloquial, and fits better into the genre of the success man that we have touched on and will return to later. The diary was published more than three decades after his death, and may be classified as

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<sup>1009</sup> Tesla, *Inventions*.

<sup>1010</sup> Bertrand Russell, “How I Write,” accessed November 23, 2011, <http://www.personal.kent.edu/~rmuhamma/Philosophy/RBwritings/howWrite.htm>.

<sup>1011</sup> Cvijić, *Autobiografija*, 34.

<sup>1012</sup> Petrović, *Metafore*, 149.

<sup>1013</sup> Tesla, *Inventions*.

<sup>1014</sup> Ibid.

<sup>1015</sup> Cvijić, *Autobiografija*, 29.

literature only in terms of the expanded definitions of literature offered by extensions of postmodernism.

For example, he writes, “It has just occurred to me that the brain may digest certain portions of food, say the ethereal part, as well as the stomach. Perhaps dandruff is the excreta of the mind — the quantity of this material being directly proportional to the amount of reading one indulges in. A book on German metaphysics would thus easily ruin a dress suit.”<sup>1016</sup> Such statements fit far better into the expectations of literature to emerge after his time, being non-committal in terms of truth claims and any hierarchical structure to information, and heavy on wordplay. It departs from what Petrović urges in terms of a simplifying search for the core of ideas. Does taste even matter in a work like this?

It also seems ludicrous to compare his narrative alongside that of the scientist writers cited thus far given the difference in style and genre. Yet, as we shall continue to explore, his narrative may be connected to a narrowing definition of success, where success is not an intellectual breadth that only expands with effort but a Jivaro head of slogans and capital, connected to the change in art explored earlier.

But it was Edison who wrote of college-educated men, like Pupin, that, “are filled up with Latin and philosophy, and the rest of that ninny stuff.”<sup>1017</sup> Tesla, in his autobiography, pities Edison, saying, in a spin on Edison’s famous catchphrase, that only a little bit of calculation would have saved him 90 per cent of the effort he was making, and that he had too much trust in his “practical American sense”.<sup>1018</sup> Yet it cannot be denied that despite this book learning, Edison’s narrative is compelling, perhaps in the same way that self-professed straight talkers born after the age of Whitman consciously developed an

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<sup>1016</sup> Thomas Edison, *The Diary of Thomas Alva Edison*, accessed December 1, 2010, <http://area24.net/VS/TheDiaryOfThomasEdison.htm>.

<sup>1017</sup> Frank Lewis Dyer, *Edison His Life and Inventions*, accessed December 15, 2010, <http://www.gutenberg.org/files/820/820-h/820-h.htm>.

<sup>1018</sup> Tesla also wrote of Edison that at his first meeting with the man, he felt he had wasted his time on the breadth of the education he had obtained, though quickly thought otherwise: “The meeting with Edison was a memorable event in my life. I was amazed at this wonderful man who, without early advantages and scientific training, had accomplished so much. I had studied a dozen languages, delved in literature and art, and had spent my best years in libraries reading all sorts of stuff that fell into my hands, from Newton’s Principia to the novels of Paul de Kock, and felt that most of my life had been squandered. But it did not take long before I recognized that it was the best thing I could have done. Within a few weeks I had won Edison’s confidence, and it came about in this way.”

unlearned but unafraid tone, like in the poems and lyrics of Woody Guthrie. What is more, his writing is nonetheless sprinkled with literary references: to Apollo, Adonis, Longfellow, Eliot—yet despite this, the no-nonsense tone is never lost, and the names seem to be more “dropped” than reflected on. All of this is relevant because a major tenet of this work is the importance of education in what was termed Victorian times—briefly listed were the alternative school systems conceived, and of course to Pupin himself, as a university professor, who not only considered education, and specialists,<sup>1019</sup> crucial to a harmonious society but also claimed to have drawn on his education for personal good in his private life. Therefore, and perhaps fittingly given its medium as a diary, it is Edison’s narrative that departs from the metaphorical model developed in this dissertation.

The core in the narrative of this work is Pupin, and Pupin’s autobiographical narrative includes even Edison, his “good friend”<sup>1020</sup> who incidentally supplied him with the screens he needed for the advances he made in x-ray research. Pupin also notes that Edison had won Helmholtz’s respect for the “simplicity” of his sonorous invention.<sup>1021</sup> Which is to say that it is interesting that this simplicity was not carried over to his writing, simple in tone but not in guiding principles: by contrast, for example, in all of Maxwell’s writing he works towards understanding symbols and those symbols that simplify by becoming progressively more encompassing: in this respect, his goals as a thinker are in line with Petrović, but also Lakoff and Turner. This concern is carried over to his leisure time, into his poems. In one verse that is about people, which we may connect to this work on an autobiography, he writes: “In the dense entangled street, / Where the web of Trade is weaving, / Forms unknown in crowds I meet / Much of each and all believing; / Each his small designs achieving / Hurries on with restless feet, / While, through Fancy’s power deceiving, / *Self* in every form I greet.”<sup>1022</sup> The poem is about humility, but even in this single verse, it is possible to see Maxwell’s attempt to make sense and abstract out of the chaotic multitude. People are different, but they are the same insofar as they are all types.

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<sup>1019</sup> Pupin, *Immigrant*, 373: “One weak point in every democracy, particularly when poorly understood and practised, is the belief among those who control political patronage that any man can do any job as well as any other man. The scientific man believes that a man must be trained for the job; hence his profound respect for the expert.”

<sup>1020</sup> *Ibid.*, 307.

<sup>1021</sup> *Ibid.*, 299.

<sup>1022</sup> Campbell, *Maxwell*, 294.

The role of simplification can also be illustrated in more concrete terms. In the early 20<sup>th</sup> century, Jovan Jovanović thought of writing a Yugoslav encyclopedia he thought the world needed because all of the information on the region required that a foreigner read many tracts, so it would be more expedient to gather information on the country in one place. One of the men solicited for this job was Jovan Cvijić, as one “who examined the links between phenomena regardless of the separate paths of their scientific perception.”<sup>1023</sup>

To take one step back to the theme of humility before moving on, it is on this note that one of Einstein’s autobiographical writings begins. He wishes to show strivers and seekers what the retrospect of another such person looks like but finds that it is difficult to bring forth “that which is *worthy* of communication”.<sup>1024</sup> He, like Cvijić, also notes that reminiscences are coloured by the present and therefore deceptive. Early on, he writes of a “chase” that can fill the stomach but not satisfy the thinking and feeling being.<sup>1025</sup> The work concludes with the idea that if the efforts of a life correspond, they lead to an expectation of a definite form<sup>1026</sup>—the link between things is again important here, as it was for Pupin, and also for Petrović and Cvijić. Russell, too, sought for the connections between things, disagreeing with philosophers who thought words should not be connected with facts but remain in a pure, autonomous world.<sup>1027</sup> This breadth is reflected also in his autobiography, which begins declaring his three passions in life: the search for love as well as knowledge and pity for the suffering of mankind.<sup>1028</sup> “I have tried to apprehend the Pythagorean power by which number holds sway over the flux,” he writes, showing his analytical aptitude at the subornation of some ideas to orderly ones. Yet later in his autobiography, we see warnings of the wrong kinds of symbolic hierarchies, in his description of the ruling classes in Soviet Russia: “They all believed their formulae would solve all difficulties.”

Although not American (relevant given the range of autobiographies chosen as comparisons to Pupin’s), we learn from his autobiography that his—rather radical—parents

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<sup>1023</sup> Andrej Mitrović, *Serbia’s Great War* (West Lafayette: Purdue University Press, 2007), 178.

<sup>1024</sup> Albert Einstein, *Notes for an Autobiography*, accessed April 1, 2010, [https://archive.org/stream/EinsteinAutobiography/EinsteinAutobiography\\_djvu.txt](https://archive.org/stream/EinsteinAutobiography/EinsteinAutobiography_djvu.txt). Emphasis added.

<sup>1025</sup> Ibid.

<sup>1026</sup> Ibid.

<sup>1027</sup> Bertrand Russell, *My Philosophical Development* (London: George Allen & Unwin, 1959), 110.

<sup>1028</sup> Bertrand Russell, *The Autobiography of Bertrand Russell* (London: Allen & Unwin, 1966), accessed May 27, 2011, <http://russell-j.com/beginner/AUTOBIO.HTM>.



had spent time in America, though it ought to be added that Russell did not really know his mother. Another American connection is the letter he cites that he had written to President Wilson, entreating him to end the war. Like Pupin, he quotes letters in full in his autobiography except that Pupin's are facsimiles, not quoted verbatim. Where Pupin, in a letter, was praised by the president for the work he did to help American forces, Russell wrote a letter beseeching an end to war.

Like Pupin, Russell also lectured in America: a funny anecdote he recounts in his autobiography has to do with the naming of his lecture, "Words and Facts" which he was told would not go down well as it was in monosyllables, so he thought up a ridiculous rephrasing: "The Correlation between Oral and Somatic Motor Habits." For all of Pupin's descriptions of the greenhorn in his autobiography, reading Russell's accounts of America, it seems that he remained the greenhorn, never quite catching on, often made victim. Or perhaps this was just because of his mixed luck; it was not as though he did not have his contacts and admirers in America, it is just that he also had detractors. In any case, another connection he had with America was through his Edith Finch, whose family history sounded like myth to him, and his to her.<sup>1029</sup>

As for objectivity, in a remark not connected to the writing of his autobiography, rather to his *History of Western Philosophy*, he wrote that he does not believe a person without bias exists, so the best thing that can be done is for a writer to admit where their bias stands and for the reader to look for writers who express the opposite bias afterwards for there to be equity. It could be said in this respect that he is a proponent of Aristotle's Golden Mean. He also ends his autobiography on a note similarly moderate, though very reminiscent of Pupin's end to his own life narrative, writing: "I am convinced that intelligence, patience, and eloquence can, sooner or later, lead the human race out of its self imposed tortures *provided it does not exterminate itself meanwhile*."<sup>1030</sup>

Many of the scientists here vied against the difficulties of being truly objective, and the question remains as to how objective humankind can be towards itself. Even science might be a thing of the mind, Russell himself had attempted to find a more perfect

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<sup>1029</sup> Russell, *Autobiography*.

<sup>1030</sup> Ibid., emphasis added.

mathematics and realized the futility of the endeavour: mankind seems bound by limits.<sup>1031</sup> Therefore, a more constructive question may be not whether or not certain narratives are myth, but which myths the reader chooses to adopt.

### 5.3.3. Agents who sold the American dream

Thus we embark on the notion of adoption; and in the late 19<sup>th</sup> and early 20<sup>th</sup> century, up for adoption was one's place of residence. As a result, cultural currency became relevant: and just like monetary currencies, some have been more universally recognizable than others. This conspicuity as Bakhtin has pointed out is a function of power: master narratives get formed,<sup>1032</sup> some cultures claim supremacy. The master narrative in this context is interesting because it involves a very literal component of travel for it was the shipping companies transporting people that contributed to the stories of the new countries that were told.

In "The Immigrant and the Image in Europe 1860-1944", Curti and Birr write about how governmental agencies promoted certain ideas of America to attract immigrants, and published pamphlets and newspapers ads to recruit them. For example, the Wisconsin Board of Immigration in 1882 published over 30,000 pamphlets and placed ads in 42 newspapers.<sup>1033</sup> Similarly, steamship agents translated articles about American wealth, or

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<sup>1031</sup> Astrophysician Arthur Eddington famously wrote, "The mind-stuff of the world is, of course, something more general than our individual conscious minds ... It is necessary to keep reminding ourselves that all knowledge of our environment from which the world of physics is constructed, has entered in the form of messages transmitted ... to consciousness [which] is not sharply defined, but fades into subconscious; and beyond that we must postulate something indefinite but yet continuous with our mental nature... It is difficult for the matter-of-fact physicist to accept the view that the substratum of everything is of mental character. But no one can deny that the mind is the first and most direct thing in our experience." *The Nature of the Physical World* (New York: The Macmillan Company, 1929 ), accessed March 17, 2013, [https://archive.org/stream/natureofphysical00eddi/natureofphysical00eddi\\_djvu.txt](https://archive.org/stream/natureofphysical00eddi/natureofphysical00eddi_djvu.txt), 276-81.

<sup>1032</sup> Mikhail M. Bakhtin, *The Dialogic Imagination* (Austin: University of Texas Press, 1981), 270-274.

<sup>1033</sup> Merle Curti and Kendall Birr, "The Immigrant and the American Image in Europe," *The Mississippi Valley Historical Review* 37, no. 2 (September 1950), 204-6, accessed September 5, 2011, <http://www.jstor.org/stable/1892129>.

used gimmicks like printing hymns cards with ads of Italian churches in America.<sup>1034</sup> Pupin saw one such steamship advertisement, and resolved afterwards to go there.<sup>1035</sup> In *Our Slavic Fellow Citizen*, a 1910 publication,<sup>1036</sup> we are told about the agents waiting in New York and Castle Garden, looking to recruit strong and sturdy immigrants—like Pupin recounts his attempt to get hired in his autobiography.<sup>1037</sup> But according to Greene, “they told the immigrants as pleasing stories as was necessary to make” immigrants see certain locations “as the Promised Land”.<sup>1038</sup> Thus begins the myth of success.

Curti and Birr also write about how in the 19<sup>th</sup> century, Europe looked to America like the “land of Canaan”—and that related ideas and goals could to some degree be realized. America, in such accounts, appears as a land where hard work would lead to material comfort, social equality and all the other perks of being a self-made man.<sup>1039</sup> Another common aspect to such narratives is the picture the emigrants brought back when they returned to the homeland after immigrating: usually, it was stereotypical, of a commercialized America.<sup>1040</sup> American emigrants are also ascribed with spreading democracy abroad,<sup>1041</sup> and we are wont to remember Pupin writing how he had lectured about it on one of his returns home.<sup>1042</sup> “The ability of the European masses to achieve, through emigration, in part at least, the life they had dreamed of, made the 19<sup>th</sup> century ‘the century of the Common Man’”.<sup>1043</sup> Such was the rise of America in the 20<sup>th</sup> century into an imperialist power, having first been a symbol of democracy in the 19<sup>th</sup> century, when publicists, politicians promoted its political preeminence.<sup>1044</sup> Of all such accounts, Curti and Birr recognized that “words, slogans, quotations, lots of remembered or imagined talk are likely to be the main factors present when a distant place is thought of... The rapid

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<sup>1034</sup> Curti and Birr, “Immigrant,” 241. Alongside these recruiters were private groups, like citizenship agencies, and religious Catholic and Mormon groups, *ibid.*, 211.

<sup>1035</sup> Pupin, *Immigrant*, 34.

<sup>1036</sup> Emily Greene Balch, *Our Slavic Fellow Citizen* (New York: Charities Publication Committee, 1910), accessed September 5, 2011, <http://archive.org/details/ourslavic00balcrich>.

<sup>1037</sup> Pupin, *Immigrant*, 41.

<sup>1038</sup> *Ibid.*, 240.

<sup>1039</sup> Curti and Birr, “Immigrant,” 203, 211.

<sup>1040</sup> *Ibid.*, 229-30.

<sup>1041</sup> *Ibid.*, 211.

<sup>1042</sup> Pupin, *Immigrant*, 153-4, 161.

<sup>1043</sup> Curti and Birr, “Immigrant,” 230.

<sup>1044</sup> *Ibid.*, 203.

shirting complex of those symbols created the ‘image’ of America”, a complex group of associations.”<sup>1045</sup> The first image of America for Pupin was that conjured by Lincoln and Franklin, which he claims was also what he had set off there in search of.<sup>1046</sup> It may have been thanks to this being his image of America that he arrested the interest of an American couple he met on a train when travelling to his Prague boarding school.<sup>1047</sup> Thanks to this conversation, Pupin learned of *Uncle Tom’s Cabin*, mention of which earned him points with the immigration officer as he was being interviewed on his arrival in America.<sup>1048</sup> However, in Pupin’s account, his being accepted had to do with the rapport he felt with the “human beings” who were in positions of authority, unlike those in Austro-Hungary, and the sympathy of those immigration officers for his tale of how he had come to America to escape the prejudice and injustice of the Austro-Hungarian authorities.<sup>1049</sup> The words and slogans that attracted Pupin to America, besides the steamship advertisement, were connected to liberty, justice, and science.

#### 5.3.4. Rags to riches: Play the game so we can all be Americans now

Pupin writes that, “A foreign-born citizen of the United States has many occasions to sing praises of the virtues of this country which the native-born citizen has not.”<sup>1050</sup> And in many ways, his autobiography is a paean to America: though as the quote suggests not just written by anyone, but one who has made it (there). Just as Pupin represented idealist traits

<sup>1045</sup> Curti and Birr, “Immigrant,” 204.

<sup>1046</sup> Pupin, *Immigrant*, 13, 14, also 35: “I had outgrown the school, the teachers, and the educational methods of Prague, and was about to depart for the land of Franklin and Lincoln, where the wisdom of people was beyond anything that even St. Sava had ever known.”

<sup>1047</sup> *Ibid.*, 30.

<sup>1048</sup> *Ibid.*, 39.

<sup>1049</sup> *Ibid.*, 40: “I said that the Hungarian and Austrian authorities had formed a strong prejudice against me on account of my sympathies with people ... who objected to being cheated out of their ancient rights and privileges which the emperor had guaranteed to them for services which they had been rendering ... I spoke with feeling, and *I felt that I made an impression upon the examiners*, who did not look to me like officials such as I was accustomed to see in Austria-Hungary ... but looked very much like ordinary civilian mortals. *That gave me courage and confidence*, and I spoke frankly and fearlessly, believing firmly that I was addressing human beings who had a heart which was not held in bondage by cast-iron rules invented by their superiors in authority.” Emphasis added.

<sup>1050</sup> *Ibid.*, 311.

of Serbia in his autobiography, he does the same for the United States. But where the images of the idealism in Serbia eventually contribute, through his Serbian mother's teaching of icons, to a spiritual, moral understanding of his scientific pursuits in the Western world; the images of idealism in America contribute, through its icons, to a picture of success.

Yet we have seen that Pupin was always weary of defending against accusations that America was materialist. An example we have not seen so far is when Pupin on one of his visits to Serbia regretted not addressing idealism in American science, for he felt that by omitting that, some Serbians concluded that there was no such idealism.<sup>1051</sup> He was very serious about presenting America as a country that invited "the most eloquent apostle of scientific idealism" to its shores.<sup>1052</sup>

He learned from Jim, in the Cracker Factory boiler room, to consider the country as, "a monument to the lives of the men of brains and character and action who made it."<sup>1053</sup> And it is not hard to imagine how this vision would be cemented in a person's mind once one has seen the nebulous frescoes such as those in the New York Public Library, or more specifically, the painting that Pupin actually records visiting when he was still studying in the Cooper Union Library, called "Men of Progress".<sup>1054</sup> The painting, commissioned by industrialist Jordan Mott—whose eponymous street commemorates his short term as mayor, includes a preponderance of drapery, diagrams, and scientific apparatus. It was painted by Christian Schussele, also a recent immigrant. He arrived in 1848, and began painting the portrait only three years later, though the portrait took six years to complete. Schussele based the painting on portraits of the eighteen inventors who all sat separately—which is noteworthy because the men had never actually met as a group. Pupin explains that when he saw the painting, he admired it so much that he took the pains to learn its meaning.<sup>1055</sup> It is intriguing to imagine how he may have in fact been attracted by the engineering sketches, or the apparatus in the corners of the painting; he soon learned who

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<sup>1051</sup> Pupin, *Immigrant*, 317.

<sup>1052</sup> *Ibid.*, 320.

<sup>1053</sup> *Ibid.*, 79.

<sup>1054</sup> *Ibid.*, 78.

<sup>1055</sup> *Ibid.*, 77.

the men were, and spied one of them one day, comparing him to an icon.<sup>1056</sup> The portrait depicts Joseph Henry, who despised patents as antithetical to free inquiry (Pupin also describes his reluctance to seek patents in his autobiography), within the closest circle around the table with Samuel Morse, who patented some of his ideas, and who he is said to have despised. Pupin writes that he looks like “he did not feel quite at home” in that company.<sup>1057</sup> There is also a portrait within the portrait of Benjamin Franklin, the father of American science and invention, which appears in the background. Of all the inventors aside from Cooper, Pupin singles out Henry as Lincoln’s peer: “He was a friend of Lincoln, and his idealism in science was just as exalted as Lincoln’s idealism in political philosophy.”<sup>1058</sup> This then, is another idealist story of America, one of monuments and portraits.

Other ideals were presented to Pupin through his experience at Beecher’s Plymouth Church, where his congregation seemed “like a beehive full of honey-hearted beings”, reminding him of the Americans who had believed in Pupin when they met him on the train as he made his way to his Prague high school, and paid for his ticket when a mishap left him without one. It was also they, Pupin explains elsewhere in his autobiography, who introduced him to *Uncle Tom’s Cabin*, which, we remember, is a book he listed proudly in his defense of why he should be admitted to America and a book whose author, Harriet Stowe Beecher, was sister to the preacher, Dr. Henry Ward Beecher. He writes of Beecher the he “firmly believed” he “was preaching a new gospel, the American gospel of humanity, the same gospel which his sister had preached. Every member of his congregation looked to me like a faithful discipline of this doctrine.”<sup>1059</sup> Thus, another idealist story of America includes this new “gospel of humanity”.

There is also the story of idealized nations: Pupin viewed American civilization as the daughter to the Anglo-Saxon, which he ties to Horace and glorifies: “The memory of this vision always recalled to my mind the ode of Horace which opens with the line: ‘O

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<sup>1056</sup> Pupin, *Immigrant*, 77. He writes he saw Peter Cooper in that very library one day, having recognized him from the painting. Cooper, “was a striking resemblance to St. Sava, the Educator, as he is represented on an ikon in our church in Idvor,” *ibid.*

<sup>1057</sup> *Ibid.*, 319.

<sup>1058</sup> *Ibid.*

<sup>1059</sup> *Ibid.*, 107.

matre pulchra filia pulchrior!’ The study of the contemplation of these two civilizations, the ancient civilization of Greece and the new civilization of the Anglo-Saxons, which appealed to me as the two greatest civilizations of human history, made every other study in my college curriculum appear insignificant.”<sup>1060</sup>

Pupin’s recognition of American ideals did not go without recognition itself: one news article reported that Pupin, “sets a high estimate in his American citizenship: the fundamental American ideals”.<sup>1061</sup>

Pupin’s respect for America was held in such esteem that he was cited as an example of evidence that should make America’s immigration laws more lax. His autobiography, “has an interesting bearing on immigration policy the possibility of capturing a few more Pupins by such a method would fully compensate the outlay”.<sup>1062</sup> Another article declared: “He is now distinctly American... We will trade William J. Bryan and his entire rag carpet sewing circle of pacifists for another such Balkan as Michael Pupin”.<sup>1063</sup> His autobiography, “brings home the danger of making immigrant regulations too hard and fast. He himself declared a ... respect... for the best traditions of his race”.<sup>1064</sup> In this context, “if temperament was, as he states, a potential snare, it also explains his particular zest in living and thinking. The poet in him dictated the man of science... It is a temperament almost non-existing among our matter-of-fact facilely romantic Americans”.<sup>1065</sup> In other words, Pupin seems most revered by those who were also idealists—true to his Serbian mother’s instruction that great men should be like the saints on icons: contemplation of their lives should bring one closer to God, the good.

Pupin seems most warmly accepted by meritocratists and not the gatekeepers of society. Consider Fuller’s critique: while Pupin was “too shy and too strange”, there were nonetheless elements that would “make an alma mater after the young peasant’s warm

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<sup>1060</sup> Pupin, *Immigrant*, 132.

<sup>1061</sup> “An American Citizen Afield,” *Berkeley Daily Gazette*, May 10, 1926, 3.

<sup>1062</sup> Review, *Journal of Social Forces* 2, no. 5 (November 1924): 784, accessed August 7, 2012, <http://www.jstor.org/stable/3006269>.

<sup>1063</sup> *Courier News*, Plain Field.

<sup>1064</sup> “Notes on Scribner’s Authors,” *Scribner’s* 72, no. 6 (December 1922).

<sup>1065</sup> “From Immigrant to Inventor,” *The North American Review*.

heart”. Pupin is “emotionally idealistic” in this review,<sup>1066</sup> which is mentioned here to highlight the distance Pupin traveled, figuratively, to become an American. In this context, the article “Adopted Sons of America Have Made Good”<sup>1067</sup> is of particular interest. The “typical” American began poor, obscure, devoid of opportunity “except those which he made for himself, and each has managed to climb from the bottom to the top in a surprisingly short time”. This is the idealism of America, in which Pupin is described as “an American product”. Even Fuller agrees that “such a career is only possible in America”, the kind that lies “between the obscure peasant hometown and the handsome Houston Valley”.

And even that myth of the American dream is also based on the myth of popular education. The ambitious immigrant can be successful only “through higher education”.<sup>1068</sup> Pupin himself speaks to this myth, not only through the long chapters in his autobiography describing his fight for and beauty of his education, but also in his articles, such as “The Revelation of Lincoln to a Serbian Immigrant”. In this article, Pupin’s views on reading are conveyed: “There is a library which is just as good as any university library for inspiring a youth who had that divine spark in his soul which I had”. Arguably, in his reverence for Lincoln, Pupin is most genuinely American—and most genuinely Serbian: in the tradition of the Serbian *hajduk* and in the tradition of the American frontiersman: the struggle for justice, being one’s own man. Velimirović describes Pupin as not coming to America for money but for knowledge: it was knowledge that built his estate, not the other way around; the estate was secondary. “Najpre iska ‘carstva nebesnago’ jevandjelju sa ostalo sve što imam došlo je uz to.”<sup>1069</sup>

This Biblical allegory coheres with the myth of rising up from poverty. In an issue of *Scribner’s*, it is written that “Professor Pupin has written this narrative to be of help to young men and to show that absolute poverty is a great incentive.”<sup>1070</sup> In the *Bemidji Press*, the reviewer assesses that Pupin’s autobiography, “reads more like fiction than fact... But it

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<sup>1066</sup> Fuller. “Professor Pupin.”

<sup>1067</sup> “Adopted Sons.”

<sup>1068</sup> *Washington Post*, September 6, 1925, C.U. Rare Books, M.S. 1035.

<sup>1069</sup> Velimirović, “O Mihajlu.”

<sup>1070</sup> *Scribner’s* 71, no. 3.



is just one of the many [stories] that might be told of the opportunities open even to the poorest immigrant boy in this land of promise”.

It is the existence of such myths that made it possible for the hard working immigrant to gain cultural currency in America. This is part of the reason why Pupin writes that, “we are all Americans today... for the simple reason that we know the ideals of the US are our own Slavonic ideals”.<sup>1071</sup> But to be more specific, the ideals that Pupin was fighting for was the, “recognition of principles fought for by American forefathers: life, liberty and the pursuit of happiness”.<sup>1072</sup>

That the figurative wealth of America was only accessible to the eyes that could see it was a sentiment Pupin expressed no less in his descriptions of Beecher: “What a spiritual giant Lincoln must have been, I thought, when I heard Beecher refer to him with humblest veneration! Beecher was the sunrise which dispelled much of that mist which prevented my eyes, just as it prevents all foreign eyes, from seeing the clear outline of American civilization.”<sup>1073</sup> It was the greenhorn who could decide on his fate of whether he would assimilate or not: one could be “a greenhorn for as long as you think you are”; the greenhorn, “doesn’t believe in democracy and sticks to older way of learning”—“how many can be made to understand this”.<sup>1074</sup> Pupin was more culturally adept than many: “My principal acquisition from my apprenticeship as greenhorn had been the recognition that there are great American traditions, and that the opportunities of this country are inaccessible to immigrants who, like Bilharz, do not understand their meaning and their vital importance in American life”.<sup>1075</sup> But Pupin always sought to find similarities, not dissonance. He compares America to his hometown, to illustrate that any local community expects some degree of assimilation on the part of its newcomers,<sup>1076</sup> and describes in some detail what such assimilation means, like physical prowess in collegial life, which, true to

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<sup>1071</sup> *NY Tribune*, March 12, 1917, 5, accessed September 5, 2011, <http://www.chroniclingamerica.com>.

<sup>1072</sup> “Makes Plea For Servians Columbia Professor Tells How Turks Oppressed His Countrymen,” *The Sun*, November 11, 1912, 2.

<sup>1073</sup> Pupin, *Immigrant*, 107.

<sup>1074</sup> *Ibid.*, 64, 92, and 116, respectively.

<sup>1075</sup> *Ibid.*, 104. Bilharz was resistant to idealisms located in things like machines, like those he felt comprised the realistic materialism of modern America, which he contrasted to the finest art of ancient Greece, *ibid.* 90.

<sup>1076</sup> *Ibid.*, 104-5.

the advice he received from a friend, more than compensated for anything he might be lacking, including “social unpreparedness”.<sup>1077</sup>

Pupin describes the story of assimilation through the phrase, “play the game”, which is what he was instructed to do at the start of his freshman year.<sup>1078</sup> His effort to play along was saluted even by one of his most severe critics, Fuller, who admits that Pupin “worked his way to Americanism and Americanization”.

Some Slavs, as we are told in *Our Slavic Fellow Citizens*, migrated simply for the “success” of no longer belonging to enemy occupation of their land. In one story, we are given the following exchange, “‘Why, Valentine,’ he said, ‘at home your pigs are housed better than you are here.’ ‘That is true,’ was the sturdy answer, ‘but I would rather live here in this log house than in a palace under the Austrian government.’”<sup>1079</sup>

From the perspective of some Americans, these immigrants in their homelands had “a conflict of races” which made “the politics of the empire incomprehensible”.<sup>1080</sup> “The significance of Austro-Hungarian immigration is revealed only when we analyze it by races. The race map of this empire shows at once the most complicated social mosaic of all modern nations. Here we see, not that mixture of races and assimilation of language which in our own country has evolved a vigorous, united people, but a juxtaposition of hostile races and a fixity of language held together only by the outside pressure of Russia, Germany, Italy, and Turkey. This conflict of races has made the politics of the empire nearly incomprehensible to foreigners, and has aggravated the economic inequalities which drive the unprivileged masses to emigrate.” Similarly, in *The South Slavs*, the authors argue that its religious culture was “a chessboard pattern of affinity and divergency which forms the basis of the complex world known as South Slav politics.”<sup>1081</sup>

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<sup>1077</sup> Pupin, *Immigrant*, 110.

<sup>1078</sup> *Ibid.*, 115.

<sup>1079</sup> Balch, *Slavic*, 214.

<sup>1080</sup> Commons, *Races*, 79.

<sup>1081</sup> Michael McAdams and Vincent F. Bonelli, “America’s Ethnic Politics,” in *The South Slavs*, ed. Joseph S. Roucek and Bernard Eisenberg (Westport, CT, London: Greenwood Press, 1982), 80, accessed September 5, 2011, [www.mcadams-croatia.net/the\\_south\\_slavs.htm](http://www.mcadams-croatia.net/the_south_slavs.htm).

One author advises that, “It is the task of America to lift them to a patriotism which hitherto in their native land they could not know.”<sup>1082</sup>

As for the middle to lower class immigrants, we are told, “They are willing to pay the price to succeed. That price is to work hard and save”.<sup>1083</sup> And we return to the idealism of the age, when the author proposes, “Race and heredity may be beyond our organized control; but the instrument of a common language is at hand for conscious improvement through education and social environment.”<sup>1084</sup> The 1920’s compilation of essays, *Modern American Prose Selections*, begins similarly.<sup>1085</sup>

There are passages from two autobiographies to be featured in this volume, one entitled *Up From Slavery*, which aside from the indicative “up” in the title, is said to be written by “one whom all must now concede to have been a very great man”. Anyone can be an American now—providing they are hard workers. The other personal narrative, “is that human and poignant epic of the stranger from Denmark who became one of us and of whom we as a people are tenderly proud. *The Making of an American* is in some ways a unique book; ... a book that one could wish that every American might know”. The essays in the volume were chosen for being, “examples typical of contemporary prose, in which writers who know whereof they write discuss certain present-day themes in readable fashion ... to impress normal and wholesome Americans as well worth reading.” In addition to including words by Roosevelt to Rockefeller, Jr., the volume’s didactic tone is decided by an emphasis on the classics, “The Struggle for an Education”, “Education through Occupation”, and “The Education of Henry Adams” (a review of the book by that name). This returns us to a theme that came up in our analysis of Pupin’s reception by the press: it was emphasized that to be a successful American, which many writers wished native-born citizens would feel inspired to become, required hard work, and education.<sup>1086</sup>

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<sup>1082</sup> Commons, *Races*, 82.

<sup>1083</sup> Balch, *Slavic*, 241-2.

<sup>1084</sup> *Ibid.*, 21.

<sup>1085</sup> Rees, preface to *Modern American Prose Selections*: “the American tradition and heritage ... on subjects that press for earnest consideration on the part of all who are intent upon the solution of our problems... the best thought of the best Americans concerning the individual’s relation to society and to the state... self-realization in education”.

<sup>1086</sup> *Ibid.*

“The Struggle for an Education” was the passage selected from the autobiography, *Up From Slavery*, by Booker Washington. It is essentially the story of how the author heard of a school and worked his way to that school by taking all kinds of jobs, some for longer periods, in the hopes the school would accept him. The volume includes many such personal narratives of hardship, including “Entering Journalism” which is a tale of a man spending his remaining funds to learn telegraphing and verging on the edge of starvation before earning entry into his desired profession. As the author of “Education through Occupations” explains, “A man’s life is not wholly fortunate unless all that is within him rises gladly to join in the work that he has to do.” Passion for work leads one to the Kingdom of God in America.<sup>1087</sup>

The works in this volume illustrate the many facets of labour, which perhaps ought to be capitalized as Labour, as it is almost a platitude that it became an American idol. Rockefeller’s essay on capital and labour stresses the importance of personal relations. Eaton’s essay on “Old Boats”, the observation, “Yet how often we pass such an abandoned farm as this with any realization that it, too, is a ruin of war, the ceaseless war of commercial greed.” Woodrow Wilson’s, “When a Man Comes to Himself” advises that “necessity is no mother to enthusiasm... [it] carries a whip ... Enthusiasm comes with the revelation of true and satisfying objects of devotion, and it is enthusiasm that sets the powers free.” Bryan, in “Education through Occupations” agrees: “you must delight in your work.” It is this feeling and “right” will that leads to the Promised Land. In this version of America, it becomes a New Jerusalem, to which everyone is invited but the hardest working are admitted.<sup>1088</sup>

These ideas were all addressed neatly by the novels of Horatio Alger—so neatly, that they are now referred to as the Horatio Alger Myth, also referred to sometimes as the success myth. By leading exemplary lives, struggling valiantly against poverty and adversity, Alger’s protagonists gain both wealth and honour, ultimately realizing the American dream. He paints a world based on meritocracy: wealth could only be gained by the respectable. In Massachusetts, a state where Pupin had many friends and which borders

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<sup>1087</sup> All quotes from this paragraph in Rees, *Modern American Prose Selections*.

<sup>1088</sup> Ibid.

the state of his abode, Alger was as revered as Harriet Beecher Stowe, giving him esteem. It is certain that Pupin would have known of Alger's books, and, as mentioned earlier, he may very well have known of Harriet Beecher Stowe's *The Lives and Deeds of Our Self-Made Men*. Perhaps more importantly, there were plenty of stories circulated during his lifetime that would have supported the myth of America as New Jerusalem. We have already seen how the myth was sold by ship agents.

### 5.3.5. We're all Americans now – cont'd

Though writing later, Ronald Takaki in *A Different Mirror* argues that there are five prerequisites to winning a place in America, four of which could be applied to Pupin: white skin, a willingness to assimilate, good fortune, and the ability to take advantage of education.<sup>1089</sup> But in many ways, Takaki himself is proof that anybody, ostensibly, and particularly in the 20<sup>th</sup> and more so in the 21<sup>st</sup> centuries, can be an American.

Gertrude Stein writes that America is the oldest country in the world because it made a precedent of the 20<sup>th</sup> century that other countries imitate, though her vision is of an America that begins in the 1960's, and involves the dark side of America. Her picture is one of lonely crowds, ideological prisons, organizations is not unlike Mumford's narrative of the industrialization of America. In his account, this began with the rationalization of objects through standardization, and mass production, concluding with the rationalization of human beings through marketing, public relations, and image consulting.<sup>1090</sup> If we are all Americans now, perhaps we wish like Goethe and Rilke to look beyond the empire to unspoiled shores, if there are any left. We may wish to awaken from the slumber of the smooth ride to feel the bump of spontaneity. The late Karl Kroeber, world literature specialist and son of the famous anthropologist, writes: "One way to wake ourselves up is

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<sup>1089</sup> Ronald Takaki, *A Different Mirror* (New York: Back Bay Books, 2008).

<sup>1090</sup> Mumford, *Mumford*, 52.

to examine verbal and visual tales from cultures directly sustained by storytelling, which now—significantly—implies the cultures of the so-called Third World.”<sup>1091</sup>

### 5.3.6. Imported thought and the question of nation

What happens to a country when ideas are exported or get imported? Rilke famously fled to Russia—“guided by the Nietzschean conviction that although God had died in the West, he continued to live a harmonious life in Christian Russia.”<sup>1092</sup> He even famously advised a young Russian to “leave Nietzsche alone” as he was concerned the German writer would not be understood, and his ideas would be harmful.<sup>1093</sup> Kristeva also saw breakdowns in modern Western thought that could only be cured by an incorporation of Slavic *ways of being* (*hesychasm*, *metanoia*, the icon).<sup>1094</sup> Thus far in this work, brief mention has been made of shifts in thought: the zeitgeist increasingly atheist, atomistic, materialistic... The purpose of this chapter is to explore which thoughts, during Pupin’s life and just a few decades afterwards, were imported to America in such a way as to change the academic climate and perspective of academic thought, in order to better understand how to extract from Pupin’s work a constructive way forward. During Pupin’s years as professor, he defended America and very pragmatically sought to defend the “higher” ideals he saw in it. For example, he appreciated the investment of industry in university laboratories, but insisted that scholars maintain independence.<sup>1095</sup>

His defense against America being “materialistic” ends with his concession that America would have made even more breakthroughs in abstract science had its growth not required some practical advances.<sup>1096</sup> Up until the 1950’s, there was still real public discourse carried out by university professors; though by that time, as Said and Schryer

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<sup>1091</sup> Kroeber, *Retelling/Rereading*, 2.

<sup>1092</sup> Travis, *Rilke’s Russia*, 1.

<sup>1093</sup> Ibid., 143 .

<sup>1094</sup> Kristeva, *Crisis*.

<sup>1095</sup> Pupin, “Romance of the Machine,” *Scribner’s* 87, no.2, (February 1930), 130-7, accessed August 7, 2012, [www.unz.org/Pub/Scribners-1930Feb-00130](http://www.unz.org/Pub/Scribners-1930Feb-00130).

<sup>1096</sup> Pupin, *Immigrant*, 203, 220, especially 319.

have pointed out, any radical social commentary was muted by universities incorporating this commentary within their walls: pacifying critics with the perks of tenure (exactly opposite to Tyndall's plea that chairs not be luxuriously endowed), and disarming critics' theories by making them relevant only within academic circles. Before the radical ideas gained a stronger voice, some of which exposed the problems of industrial, capitalist society, there was still room for Pupin to argue that the materialistic aspect of science was criticized because it was not understood. Indeed, none of the major detractors possessed half the scientific knowledge Pupin did. Pupin's success, if it is to be followed, depended on a degree of public discourse but also a somewhat educated public.

It will be argued in this section that Pupin's (Slavic? *True American*?) views towards matter and the world fell out of fashion just a few decades after his death because already during his life, an alternative system of values, which dictated man's "new" place in the universe, were being imported into America. It is no accident that Thoreau and Emerson were responsible for bringing to America aspects of Eastern thought, but what of the ever less popular middle ground between East and West, i.e. Serbia, as well as Bulgaria, Romania, even Greece. Some of what was imported, like Pupin, and Louis Agassiz, was forgotten relatively quickly, replaced by the newer import of "higher criticism" higher than man and all his machines. Davenport, who wrote much in an attempt to bring Agassiz back into fashion, has also warned that much of what is important to society may be forgotten. This, he wrote, in his review of one of the Levi-Strauss volumes on *myth*.<sup>1097</sup> Part of the beautiful complexity of Pupin's autobiography rests on myth and colourful depictions of other cultures. He is not the only such writer whose works would benefit intellectuals through their resurgence.

Louis Agassiz was friends with Emerson and Thoreau—it was with the latter that a detailed conversation about turtles annoyed the former during a dinner Emerson was hosting.<sup>1098</sup> Agassiz was a natural historian whose scientific writing was admired for its literary qualities by Pound and, "knew more about fish than he was able to find from his professors or in their libraries, and whose last act in a life as creative as that of Leonardo or

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<sup>1097</sup> Davenport, *Force*, 8.

<sup>1098</sup> Davenport, *Geography*, 231.

Picasso, was to sail along the route of the Beagle before announcing his final and authoritative rejection of evolution”.<sup>1099</sup> His *Contributions to the Natural History of the United States* were so comprehensive, “that the mind marvels at the inconceivably fine book the finished work would have been; for in 1,600 pages Agassiz has but described the embryology of the North American turtles and the anatomy of the most elusive and perishable of creatures, the jellyfish and his kin. ‘Jellyfish?’ a transcendentalist once asked Agassiz. ‘It seems to be little more than organized water.’”<sup>1100</sup>

In Agassiz, as in Pupin, there is no conflict between humanist and scientist; religion and science, poetry and scientific fact. It could have been Pupin, not Agassiz, who met Emerson’s complaint that he was emphasizing science to the detriment of an Ivy League.<sup>1101</sup> As Davenport writes, “Ideas of nature are moral ideas”<sup>1102</sup>—and we might add that ideas of man are, too. Pound’s illustration of Agassiz describes him instructing a student to describe a sunfish: the ‘qualified’ student first just named it, was told by Agassiz to describe it again, then described its textbook genus, and was asked to try again, then wrote a four-page essay, and was asked to look at the fish. “At the end of three weeks the fish was in an advanced state of decomposition, but the student knew something about it.”<sup>1103</sup> The physical world held his attention, as it did that of the romantic poets, and Thoreau. They also knew how to look. It was this that interested Pound, who, like Davenport, saw the benefit of such examples for students of writing and literature.

Agassiz was an American import. But he, like Pupin, was replaced by other imports, arriving at the same time or in their wake. Perhaps they are forgotten because, as Davenport writes, “Hindsight instructs us to wonder why Agassiz could not see the truth of Evolution.”<sup>1104</sup> (Though evolution has yet to be conclusively proved.) Perhaps they are forgotten because they are out of fashion now. It is not a value statement but merely an observation to say that the new system is to replace God, to raise man up with his reason, to

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<sup>1099</sup> Davenport, *Geography*, 234. “The ideas of nature were for Agassiz what an image is for Picasso,” *ibid.*, 245.

<sup>1100</sup> *Ibid.*, 235.

<sup>1101</sup> *Ibid.*, 246-7.

<sup>1102</sup> *Ibid.*, 246.

<sup>1103</sup> *The ABC of Reading*, qtd. in Davenport, *Geography*, 247.

<sup>1104</sup> *Ibid.*, 242.



divorce him from the complicity of things insofar as things symbolically serve a universal ideal. It is not surprising, then, that in some of these systems, things, including machines, become menacing, with nothing but human fallibility to keep them in check. Again, Mumford writes, “For mark this: only those who live first and who keep alive have earned the right to use the machine.”<sup>1105</sup>

### 5.3.7. Myth vs. mystery

An example of the imported thought that sought to take the mystical out of thought was the break with tradition represented by higher criticism. A more specific example is the attempt to “dissolve” a historical event in a “mythical solution”—which can boil down to taking things too literally and therefore represents an antipode to the poetic, which might even be described as mystical insofar as disbelief is suspended as two different things are made one through the comparison of the metaphor. To illustrate this, we shall consider a small work by Theodore Parker, who, apart from being a transcendentalist preacher whose works would later inspire the writings of Lincoln and Martin Luther King, spoke five languages including Coptic and Syriac, made an impact on thought, was an Abolitionist<sup>1106</sup> who fought for the liberty of others.<sup>1107</sup> This very aspect of America’s history (slavery) is what deferred the influence of 19<sup>th</sup> century European thought.<sup>1108</sup>

Parker wrote a review of David Strauss’ *Life of Jesus* (translated into English by George Eliot), an influential, controversial theological work, known to have influenced Nietzsche early on and methods of German “higher criticism”, bringing the debate on

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<sup>1105</sup> Mumford, *Mumford*, 52.

<sup>1106</sup> He led the Fugitive Act, the law that stated a slave remains his owner’s property, even if he has taken exile elsewhere. It culminated in the 1850 Compromise.

<sup>1107</sup> See Theodore Parker, *Speeches, Addresses, and Occasional Sermons, Vol. 1-3* (Boston: Horace B. Fuller, 1867), accessed October 8, 2012, <http://www.gutenberg.org/browse/authors/p#a7088>. He enabled former slaves, the Crafts, to start new lives of liberty. They went on to become popular lecturers, speaking against poverty and about war, education, America, anti-slavery, and the safeguards and sins of society. The illustration showing the importance of the public lecture at that time: mentioned in an earlier chapter of this work.

<sup>1108</sup> Nancy Koester, *Harriet Beecher Stowe: A Spiritual Life* (Michigan: Wm. B. Eerdmans Publishing Co., 2014), 487.

liberal theology to America (as well as European scholarship and critical inquiry). Parker was influenced by new German historical biblical criticism and writes that Strauss denies authenticity by reading too much into the myths he perceives: “Mr. Strauss takes the idea, which forms the subject, as he thinks, of a Christian myth, out of the air, and then tells us how the myth itself grew out of that idea. But he does not always prove from history or the nature of things, that the idea existed before the story or the fact was invented. He finds certain opinions, prophecies, and expectations in the Old Testament, and affirms at once these were both the occasion and cause of the later stories, in which they reappear. This method of treatment requires very little ingenuity, on the part of the critic; we could resolve half of Luther’s life into a series of myths, which are formed after the model of Paul’s history; indeed, this has already been done. Nay, we could dissolve any given historical event in a mythical solution, and then precipitate the “seminal ideas” in their primitive form. We also can change an historical character into a symbol of “universal humanity.” The whole history of the United States of America, for example, we might call a tissue of mythical stories, borrowed in part from the Old Testament, in part from the Apocalypse, and in part from fancy.”<sup>1109</sup>

The passage suggests that to look for myth becomes a self-fulfilling, if ridiculous-sounding, prophecy. It is interesting that Maxwell also read Parker’s work, and his thoughts about it are recorded in the book about him that Pupin read. He distills an example of what Parker was criticizing, the making of the historical into the mythical: “Here is the way to dissolve any given historical event in a mythical solution, and then precipitate the seminal ideas in their primitive form. It is from Theodore Parker, an American, and treats of the Declaration of American Independence. ‘The story of the Declaration of Independence is liable to many objections if we examine it *a la mode* Strauss. The Congress was held at a mythical tone, whose very name is suspicious—Philadelphia, brotherly love. The date is suspicious: it was the fourth day of the fourth month... the President was chosen for 4 years, 4 departments of affairs, 4 political powers, etc... Still further, the declaration is

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<sup>1109</sup> Theodore Parker, *Strauss’ Life of Jesus*, 300-301, accessed October 8, 2012, <http://digitalcommons.unl.edu/etas/7>. Cited in Campbell, *Maxwell*, 300-1.

metaphysical and presupposes an acquaintance with the transcendental function on the part of the American people. Now the *Kritik of Pure Reason* was not yet published,' etc.”<sup>1110</sup>

Of interest to us here is both the manipulation of the “mythical solution” and what is made of it, as well as the significance of bringing to America a language that denies miracles (one of Pupin’s more famous anecdotes involves him downplaying human inventions by holding up his finger and claiming it was the true miracle). The latter resulted in liberal theology and it is argued that the resulting materialistic view towards understanding, castigating mystery, led to the weakening of philosophy in the 21<sup>st</sup> century.<sup>1111</sup> Of interest to us here, too, is the separation out of religion, science, and philosophy from literature. Freeman Dyson, who was born almost at the same time Pupin’s autobiography came out, writes his view of the history of post-19<sup>th</sup> century academia as having been influenced by Whewell to the preponderance of science at the expense of philosophy, and considers Nietzsche wrote the last great works of philosophy. He further concluded that the mystical no longer has a place even in philosophy departments.<sup>1112</sup>

These references are relevant to us because seeing that Pupin’s autobiography was first released to the American reading audience, and that the mores of this audience have shifted from where they were, this distance needs to be accounted for in order to explain the difficulties some modern readers might have in relating to his prose. One of these shifts has been the denial of the mystical,<sup>1113</sup> as we saw above; it has been banished from higher

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<sup>1110</sup> Campbell, *Maxwell*, 84.

<sup>1111</sup> Susan L. Mizruchi, *The Science of Sacrifice: American Literature and Modern Social Theory* (Princeton: Princeton University Press, 1998), 96-7.

<sup>1112</sup> Freeman Dyson, “What Can You Really Know,” *The New York Review of Books*, November 10, 2011, accessed November 10, 2011, <http://www.nybooks.com/articles/archives/2012/nov/08/what-can-you-really-know/?pagination=false>: “Until the nineteenth century, science was called natural philosophy and officially recognized as a branch of philosophy. The word “scientist” was invented by William Whewell ... in the year 1833. He was waging a deliberate campaign to establish science as a professional discipline distinct from philosophy. Whewell’s campaign succeeded. As a result, science grew to a dominant position in public life, and philosophy shrank. Philosophy shrank even further when it became detached from religion and from literature. The great philosophers of the past wrote literary masterpieces such as the *Book of Job* and the *Confessions* of Saint Augustine. The latest masterpieces written by a philosopher were probably Friedrich Nietzsche’s *Thus Spoke Zarathustra* in 1885 and *Beyond Good and Evil* in 1886. Modern departments of philosophy have no place for the mystical.”

<sup>1113</sup> By contrast, in 1873, one response to the hubbub created by Strauss’ work was the following assessment, uniting the minds quoted so far in this chapter: “Even Mr. Tyndall maintains that if a right-hand spiral movement of the particles of the brain could be proved to produce love, and a left-hand spiral movement hate, we should still be as far as ever from knowing the causes of the movements themselves;

learning. Ideas and worldviews seem to come and go—but they also travel,<sup>1114</sup> which means that while it seems they have disappeared, their disappearance can be a myth if they have only moved elsewhere.

Brief mention must be made of Nietzsche particularly in a work like this one that attempts to consider science, and not only because he was cited by Dyson or because he wrote a book on Strauss, *David Strauss, the Confessor and Writer*, but because he engaged in his own form of metaphysical inquiry which included tenets based on science.<sup>1115</sup> Again, this can only be taken as a contrast to Pupin's cosmology, and as a further historiography of the transcendence of mystery.<sup>1116</sup> Deleuze writes that Nietzsche "did intend to 'go beyond' metaphysics",<sup>1117</sup> (though in this reader's opinion, Nietzsche seems to be claiming that the science and mechanisms that do this are illusory) and in *Nietzsche in American Literature and Thought*, a connection is forged between Nietzsche and Emerson<sup>1118</sup> as both were "fully aware that after Plato there was no way to jump further than the Athenian's shadow".<sup>1119</sup> Yet Pupin shows that progress (which Nietzsche was also critical of) was still possible in the new age, even with a classical background, through the advances made of science, and possibly even social science, regarding ideal democracy that required of people to work together and make a contribution.<sup>1120</sup> By contrast, Nietzsche's notions of the

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while profounder minds, like Sire John Herschell ... and Professor Agassiz ... understand by the vague phrase 'natural law' nothing other than the omnipresent fixed method of action of the divine will". Joseph Cook, "Article X: Strauss' Superficiality" *Biblioteca Sacra*, Eds. Edwards A Park and George E. Day, Vol. 30 (Andover: Warren F. Draper, 1873).

<sup>1114</sup> It is significant that George Eliot, who translated Strauss' controversial work into English, met with Ralph Waldo Emerson, who was himself traveling abroad for reasons not quite clear. Emerson in turn had socialized with Parker, ten years previously and influenced Nietzsche, in Germany, though they had never met (similarly influencing Tyndall, who did see one of his lectures).

<sup>1115</sup> Greg Whitlock, "Ch.1 XVIII Roger J Boscovich and Friedrich Nietzsche," in *Nietzsche, Philosophy and Epistemology of Science*, ed. B. E. Babich (NY: Springer, 1999), 187-202.

<sup>1116</sup> Such as his reading of Socrates in *The Birth of Tragedy* wherein Socratic rationalism, an illusion of science, leads to the destruction of Dionysian mystery, myth, and music, making it possible for science to not only fully comprehend the world of nature but also control it. See Friedrich Nietzsche, *The Birth of Tragedy, or Hellenism and pessimism*, trans. Wm. A. Haussman (London: George Allen & Unwin Ltd., 1909), accessed November 21, 2012,

[https://archive.org/stream/thebirthoftraged00nietuoft/thebirthoftraged00nietuoft\\_djvu.txt](https://archive.org/stream/thebirthoftraged00nietuoft/thebirthoftraged00nietuoft_djvu.txt), 116-20.

<sup>1117</sup> Gilles Deleuze, *Nietzsche and Philosophy* (New York: Columbia University Press, 1983), 195.

<sup>1118</sup> Jurgen H. Meyer-Wendt, "Nietzsche in American Literature and Thought," *Monatshefte* 89, no. 3 (Fall 1997): 417-22, accessed September 5, 2011, <http://www.jstor.org/stable/30153678>.

<sup>1119</sup> *Ibid.*, 418.

<sup>1120</sup> Pupin, *Immigrant*, 373: "One weak point in every democracy, particularly when poorly understood and practised, is the belief among those who control political patronage that any man can do any job as well as

self reveal an Emersonian influence in his concept of the “sovereign individual... liberated again from morality of custom”.<sup>1121</sup> This will become important in our survey of late 19<sup>th</sup> and early 20<sup>th</sup> century American literature concerned with the individualistic extremes of selfish materialism, now freed from any metaphysical meaning beyond the strictly material.

With transcendence in Nietzsche’s language, come problems of relativity and perspective.<sup>1122</sup> It could be said that his language replaced the existence of mystery, the space it would otherwise occupy, with his own cryptic proclamations. “What does the one that seeks truth want? ... The method of dramatization is thus presented as the only method adequate to Nietzsche’s project and to the form of the questions that he puts: a differential, typological and genealogical method.”<sup>1123</sup> Suffice it to say, no such method is needed to read Pupin.

### 5.3.8. The Myth of Iconoclasm and Poetic Ramifications

While the transmission or reception of Nietzsche’s ideas are thus fuzzy, literary critic H.L. Mencken being among those who misread him if but to promote his own agenda, it is perhaps in Mencken’s reading where we find the most potent and relevant in Nietzsche to our work: “iconoclasm is necessary to allow man to build a better world.”<sup>1124</sup> This is the central point this section has been building to: for in the single word iconoclasm it represents the antipode to Pupin’s eternal truths, made visible through the poetic symbol of

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any other man. The scientific man believes that a man must be trained for the job ... Nothing in his opinion will advance our national strength and well-being so much as the ability of enlightened public opinion to differentiate between the expert and the clumsy product of political patronage.”

<sup>1121</sup> Meyer-Wendt, “Nietzsche,” 421. Robert Ackermann points to the problems of reading Nietzsche due to “the vacuous hermeneutic circle” in his writings—incidentally reminiscent of Socrates’ criticism of sophists, in Friedrich Nietzsche, *Beyond Good and Evil*, accessed October 8, 2012, <http://www.gutenberg.org/files/4363/4363-h/4363-h.htm>.

<sup>1122</sup> Such difficulties also stem from Nietzsche’s own views on truth: it being but an experimental model. Nietzsche writes, “It is certainly not the least charm of a claim that it is refutable; it is precisely thereby that it attracts the more subtle minds,” in Friedrich Nietzsche, *Beyond Good and Evil*.

<sup>1123</sup> Deleuze, *Nietzsche*, 79. Deleuze goes so far as to suggest that we read “a book like Zarathustra ... as a modern opera and seen and heard as such, *ibid.*, xiii.

<sup>1124</sup> H.L. Mencken, “H.L. Mencken’s Comprehension of Friedrich Nietzsche,” *Comparative Literature Studies* 7, no. 1 (March 1970): 43-9, accessed October 8, 2012, <http://www.jstor.org/stable/40467872>.

the icon. Iconoclasm is the tenet of seeking to be unencumbered by dogma (and resulting hostile stands towards the ‘mystical’ in Christianity) that can be found in Strauss, Parker—and Matthew Arnold, who was ‘imported’ by Lionel Trilling, comparable to Mencken in terms of the reach he had. Dogma is not presented as a burden in Pupin’s autobiography; rather, tenets such as scientific discipline, together with virtues, are presented as bringing rewards achieved through an understanding that realizes that the visible universe is not the final stop for thought, but one of two terminals, as we saw earlier.

Arnold, like Tyndall, was under the influence of Carlyle for some time,<sup>1125</sup> and was interested in religion, in terms of its “poetic” aspects and virtues, but was against “superstitious” aspects. If we are to take his preface to *God and the Bible* literally, he shares something in common with Parker: “The personages of the Christian heaven and their conversations are no more matter of fact than the personages of the Greek Olympus and their conversations”.<sup>1126</sup> He preferred the “natural truth” of Christianity to its “miracles”.<sup>1127</sup> Again, the Carlylian influence brings Arnold closer to Tyndall and George Eliot, and further from Pupin—yet closer to the thought of today.

While it is generally accepted that Arnold forms a bridge between Romantic and modern thought, he is also interesting in this context because of his admiration of the classical education. This is illustrated in “Empedocles on Etna” a poem described by Trilling as the juxtaposition of two kinds of poetry, in which one, the rational and material, destroys mystery and extinguishes the imagination through the loss of myth, while nature becomes mechanical instead of animate.<sup>1128</sup> It may be read as a poem about the end of

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<sup>1125</sup> Carlyle influenced Tyndall to feel reverence for Goethe, see Tyndall, *New Fragments*, 47. Carlyle also gave Tyndall his copy of *Theory of Colours* which Goethe had given to him, *ibid.*, 48.

<sup>1126</sup> Matthew Arnold, *God and the Bible* (London: Smith, Elder & Co., 1897) accessed October 8, 2012, <http://archive.org/stream/godbiblesequelto00arno#page/n7/mode/2up>, xiv.

<sup>1127</sup> Matthew Arnold, *Literature and Dogma*, accessed October 8, 2012, [http://en.wikisource.org/wiki/Literature\\_and\\_Dogma/1883\\_Preface](http://en.wikisource.org/wiki/Literature_and_Dogma/1883_Preface).

<sup>1128</sup> Lionel Trilling, *Matthew Arnold* (New York: Columbia University Press, 1949), 83, accessed August 7, 2012, [http://archive.org/stream/matthewarnold000095mbp/matthewarnold000095mbp\\_djvu.txt](http://archive.org/stream/matthewarnold000095mbp/matthewarnold000095mbp_djvu.txt) : “But the ancient world, sunlit and warm and mysterious, is a world the weary Empedocles cannot believe in; imagination is quite dead for him, killed by his knowledge – Rationalism and materialism have destroyed mystery ‘by rule and line,’ have clipped the angel’s wing and emptied the once-haunted air and Empedocles feels that life is no longer to be supported. Leopardi said of his own melancholy and that of his contemporaries that it was the result of the shrivelling of the imagination which resulted from the loss of a world explainable by myth; Nature is no longer animate and sentient but mechanical and necessary.”

poetry. Also addressing the loss of mystery, and foreshadowing Kristeva's later diagnosis of the predicament of Western thought, Trilling writes that the clash between religion and science leads to despondency and a sense of futility.<sup>1129</sup> Again, are echoes of Nietzschean nihilism, reminiscent of Velimirović's critique that most critics are essentially bored and mistake rural stations for big town fairs, finding a deceptive pleasure in their boredom.<sup>1130</sup> Trilling writes, "More delicate souls find the atomistic society beyond their control and utterly arid ... The 19<sup>th</sup> century, trying to hide its ugliness, raises the Gothic façade to mask the machine, and calls upon the artist to assist its dull masquerade."<sup>1131</sup> Conversely, we have Poe's Gothic and his consideration of Spengler's tragic portrayal of history as independent of our will in his critique of the "effeteness of a finished culture" in *The Fall of the House of Usher*, *The Murders in the Rue Morgue*.<sup>1132</sup> Are things being blamed because mystery cannot be taken literally (and is by default poetic, being a similar suspense of disbelief before the metaphor is formed) and virtue is assigned the practical role scientists are being accused of promoting? Pupin would have us understand things, noting that it must be taught.<sup>1133</sup>

Trilling writes of a sterile world in which art is dying, taking as evidence the fact that Arnold's 1853 epigraph to his poems quotes Choerilus of Samos, "Yea, blessed is the servant of the Muses, who in the days of old ere the meadow was mown, was skilled in song. But, now, when all is apportioned and a bound is placed to the arts, we are left behind like stragglers who drop in at the tail-end of the race."<sup>1134</sup> This is not the Arnold of *Culture and Anarchy*, who, like Pupin and Ruskin, argues for the importance of education as a way to ameliorate social welfare.

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<sup>1129</sup> Trilling, *Matthew*, 84: "The moods of dejection, of emotional stoppage, which in a simpler religious age would have been taken to mean an abandonment by God, in this age of conflict between religion and science are found to stem from the misery of living in a pointless universe which makes pointless everything in it."

<sup>1130</sup> Velimirović, "Religija", 873.

<sup>1131</sup> *Ibid.*, 120.

<sup>1132</sup> Davenport, *Imagination*, 10.

<sup>1133</sup> Pupin, *Immigrant*, 378: "A life guided by aims and aspirations such as he describes is a life of saints and not of ordinary materialistic clay. Such a life cannot be attained without unceasing nursing of the spirit and unrelenting suppression of the flesh." Or, his being taught by his mother that the higher meaning of material things was the eternal truth, 194. Or, his description of learning to see how every material thing extends to infinity, 229. Or the direction and discipline that great men bring to their science of things, 366.

<sup>1134</sup> Trilling, *Matthew*, 121.

While Arnold criticized Victorian culture for being caught up in mechanistic ways of thinking,<sup>1135</sup> interpreting material accomplishments as ends in themselves, he lamented that the traditional font of wisdom was being cut off from mankind. Suffice it to say that the viewing of the material as an end in itself also marks the end of poetry and the potential of things to mean more than what they appear to be.

Randall writes that a survey of 20<sup>th</sup> century American literature shows a noticeable move away from the Romantic ideals from before, and that this was due to the changing job market as well as the feeling that man's access to resources was no longer mediated by "metaphysical constraint". All that remained of Romanticism was an individualism that promoted and justified economic individualism, which was the building force behind industrialism in modern capitalism. "A Goethe or an Emerson, in counseling self-reliance, may not have had the remotest idea of producing the self-made business man and 'captain of industry'—the phrase comes from the hero-worshipping Carlyle—but the influence has trickled down by devious channels until even today our magazines are full of appeals to 'Cultivate your personality—make \$50,000 a year.'"<sup>1136</sup>

Which brings us to the 20<sup>th</sup> century themes of capital and what Habermas calls the "post-metaphysical". Thence, too Nietzsche's Emersonian notions of the self in his concept of the "sovereign individual... liberated again from morality of custom",<sup>1137</sup> mentioned above.

In "Business and the Literati" Valiunas shows how Thornstein Veblen's *Theory of the Leisure Class*, published in 1899, was before its day, with its statement, "Freedom from scruple, from sympathy, honesty and regard for live, may, within fairly wide limits, be said to further the success of the individual in the pecuniary culture." From Ida Tarbell's *The History of the Standard Oil Company* in 1904, which showed the ruthless monopolist John D. Rockefeller pitting himself against laissez-faire smaller oilmen, to Theodore Dreiser's *Trilogy of Desire* in 1912 (republished also in 1947), simplifying the muckraker's critique of the businessman—and so depicting commerce as corrupting, not edifying, Valiunas

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<sup>1135</sup> Also see Arnold, *Culture and Anarchy*, 10-14, for "machine" criticism, and how culture had the task to right this wrong.

<sup>1136</sup> Randall, "Romantic," 16.

<sup>1137</sup> Meyer-Wendt, "Nietzsche," 421.



makes a compelling argument as to increasing selfishness in a world increasingly geared towards capital. He cites Sinclair Lewis' sardonic observation of American middle class mores—boorish and vicious, Arthur Miller's stereotypes of the businessman—the hard-faced boss and the broken underling, summed-up in *Death of a Salesman*, “If you can't make a killing, you get murdered.” Even David Mamet has a line that chimes in here, free enterprise is described as: “the freedom ... of the individual ... to embark on any f- course that he sees fit.” Glengary Ross' “To be a man is to be hard, a cutthroat competitor ... rampaging needs are what he has in place of a moral compass”; Saul Bellow's schemer in *The Adventure of Angie March*; Tom Wolfe's *The Bonfire of the Vanities*, William H. Whyte's *The Organization Man*,<sup>1138</sup> and of course Ayn Rand's *Atlas Shrugged* all paint an increasingly grimmer world being replaced by envy in the strive towards economic perfection and the increasing desire for more and more. In this version of America, it is all right to aim high, even if this means letting ambitions get the better of one's good sense.<sup>1139</sup>

Somewhere between individual transcendence and chthonic nihilism—which are essentially dead-ends to poetic value, transcending into the nothingness of the unfertilized or descending into an underworld that has lost its Orphic will for the living, both expressions of the nightmare of rootlessness where roots imply both procreation and life—are the narratives of Agassiz and Pupin. In an article that addresses America, materialism, and Christianity, “The Romance of the Machine,” Pupin expounds his views on these topics—specifically localizing his ideals in the American situation, arguing that the quickest way for the creative power of industry to be advanced is through idealism. And although Agassiz has fallen from popularity, it can be argued that his ideas of “metamorphosis”,<sup>1140</sup> akin to evolutionary ideas, could provide useful constructs for further thought, just as Pupin's views of the potential for the evolution of society can also be revisited: Arnoldian boredom or bleakness, and the loss of poetry, is not inescapable.

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<sup>1138</sup> In which advice is given to job applicants on how to cheat on tests given by big American corporations: “I don't care for books or music much./I love my wife and children./I don't let them get in the way of company work,” qtd. in Algis Valiunas, “Business and the Literati,” *National Affairs* 9 (Fall 2011) accessed August 7, 2012, [www.nationalaffairs.com/publications/detail/business-and-the-literati](http://www.nationalaffairs.com/publications/detail/business-and-the-literati).

<sup>1139</sup> Ibid.

<sup>1140</sup> Davenport, *Geography*, 243.

In “Romance”, Pupin writes that just as a peasant does not worship the wood and paint of the cross, but the spirit of Christ, the scientist and the engineer worship the spirit behind the machine, “a revelation which assures them that nature loves them and will guide them towards the evolution of a higher civilization”.<sup>1141</sup> This, in essence, is an explanation of the basic literary assumption that meaning is attributed to things by man, not inherent in them—but, in accordance with the notion of mimesis, reflective of larger, cosmological truths. Inventions like the steam-engine are but “crude” imitations of the cosmic engine, and Pupin describes the “machine” of a tree—such as through the various operations of photosynthesis, making of it a mimetic, poetic symbol, reflecting larger values. Man is to learn from nature, as prophesied in Job, “But ask now the beasts, and they shall teach thee; and ask now the fowls of the air, and they shall teach thee...” by striving for an “open-minded, unprejudiced interpretation of the language of nature”.<sup>1142</sup> “The inventor planted the seed of hope in the soul of man that some day he would work out his salvation from the burden of Adam’s original sin.”<sup>1143</sup> He underlines at the beginning of this essay that the university is the “guardian” of science—and while its laboratories may be funded by industry, “the idealist retained his independence”.<sup>1144</sup>

Even the non-literal approach of high criticism, through its connection to metaphysics (even transcendentalists believed in some form of divinity), is potentially an open-ended system, described by Burke as the “craftiness” of any system that through metaphysical associations points beyond itself—and thus leaves more to be achieved. Emerson wrote, “Every natural fact is a symbol of some spiritual fact.” The spiritual facts and also the similarities depend on perception to be uncovered; when looked at in the right way, a machine that begets offspring, must be able to do so because it is comprised of particles, for, like Emerson wrote, “Each particle is a microcosm, and faithfully renders the likeness of the world.” That sentiment, reflective of mimesis, shows that similarities may be found even in disparate thinkers—even in disparate cultures, like Pupin brought Serbia and America together.

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<sup>1141</sup> Pupin, “Romance,” 136.

<sup>1142</sup> Ibid., 134-5.

<sup>1143</sup> Ibid., 135.

<sup>1144</sup> Ibid., 130.

The ideas imported into America leading to transcendence did not arguably take root until the 20<sup>th</sup> century when the shift in philosophy joined forces with a global industry detached from classical literary mores. Or perhaps that is a myth, and the truth is that more work has to be done to forge mystical associations to open the ends of the system up again, to overcome iconoclasm, like Pupin not only seeing his finger as the greatest invention, but as a sign of eternity. It was Pupin's insight to find poetry wherever he looked, such as in the idealistic pragmatism in America and the pragmatically iconic advice of his mother.

#### 5.4. Myths of scientific revolution

The powerful narrative about the birth of modernity is often presented alongside the emergence of linear drawing in the 15<sup>th</sup> century and the emergence of modern science, nationalism, and the individual artist. After Galileo, natural science becomes increasingly qualitative, descriptive. However, it is argued today that the Scientific Revolution is a myth<sup>1145</sup> because the past is not transformed into the modern at any given moment, and discoveries are often based on incrementally performed previous work. What is more, discoveries have their precedence, as illustrated by the study of optics or the antikythera.<sup>1146</sup>

The cult following of scientists is also criticised.<sup>1147</sup> Attention is instead devoted to those who did the previous research that contributed to a scientific breakthrough or to those who promoted or helped develop a scientist's ideas. For example, were it not for scholar

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<sup>1145</sup> This approach, forwarded by Pierre Duhem, George Sarton, James Franklin, Robert Pasnau, and others, is called the continuity thesis.

<sup>1146</sup> Mathematical modeling emerges within both Greek and Islamic optics; *camerae obscurae* exist as far back as the 4<sup>th</sup> century BCE in Aristotle, and the 5<sup>th</sup> century BCE in Mozi—though it only reappears in the 16th century in Leonardo da Vinci. Perhaps more significant is the recent discovery of the antikythera, similar to mechanical devices mentioned in Cicero, and even Babylonian astronomy, which not only mimics the exact mechanisms depicted in later Renaissance paintings, but suggests that gear-based technology already existed in the ancient world. This means that even complex automatic mechanisms may have been more extant than has generally been believed.

<sup>1147</sup> Essentially, as part of Carlyle's Great Man Theory, first attacked, almost at its inception, by Herbert Spencer. A popular modern example of criticism pertaining to science is: Waller, John, *Fabulous Science: Fact and Fiction in the History of Scientific Discovery* (Oxford: Oxford University Press, 2004).

Georg Joachim Rheticus, who persuaded Copernicus to publish *De revolutionibus*, his discoveries would probably have had to have waited to be discovered by someone else, later. Rheticus personally brought the manuscript to a publisher in Nuremberg. Also, it was Edmund Halley who posed a critical question to Newton, leading him to write *Principia*.

It is argued that the world was, in part, already prepared for their discoveries, and that particularly when it comes to inventions and discoveries, the question of authorship can often be debated. Nothing Darwin, Copernicus, Descartes or Newton did existed in a vacuum. If they had never lived, someone else may have made their discoveries. As Pupin himself said, sometimes any number of scientists is working on the same question, so it is possible for several to arrive at the same solutions at the same time.<sup>1148</sup>

The Great Man theory, popularized by Thomas Carlyle, gained hold through several trends. One is tied to Whig history: the idea that man, through his reason, is ever progressing, and shall one day reach total enlightenment. It is noted that Pupin, while ending his autobiography on the hopeful note that America one day might reach ideal democracy, he tempers this vision with the words, “if attainable at all”.<sup>1149</sup> While it may be said that the 19<sup>th</sup> century seemed particularly optimistic for many, not all thinkers prefaced their visions with conditional clauses. The X-Club, founded in 1864, whose members included Huxley, Spencer, and Tyndall, largely expected that from the progress of science would flow social, intellectual, and economic progress. This view was so strong that it was reflected in Dickens’ “Common Cookery”: “The scientific age equaling the sum of happiness will be increased, ignorance destroyed and with ignorance, prejudice and superstition.”<sup>1150</sup> Similarly, Pasteur predicted that eventually science and peace must triumph over ignorance and war. Science and education were lauded. Dickens wrote that the harmony of education would bring the classes together: “We seek to bring into innumerable homes the knowledge of man social wonders... that are not calculated to render any of us ... less faithful tin the progress of mankind.”<sup>1151</sup> The Great Exhibition, though described as overwhelming, was also singled out for its “special signs and tokens of

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<sup>1148</sup> *The Saint Paul Globe*, November 9, 1902, 25, C.U. Rare Books, M.S. 1035.

<sup>1149</sup> Pupin, *Immigrant*, 387.

<sup>1150</sup> Metz, “Science,” 124.

<sup>1151</sup> *Household Words*, qtd. in Ostry, “Social Wonders.”

the peaceful progress of the world, how numerous, how diversified.”<sup>1152</sup> The writers on science tended to communicate a strong spirit of optimism for the future and championed the modern world over times past. It was believed by many, apart from critics like Ruskin, that science and technology would make the world more civilized and comfortable. We have seen that such views can be found in Pupin’s autobiography, such as in his notion of creative coordination. However, his “creative coordination” involved a spiritual element and prerequisites of virtue, which set his positive vision apart.

Another aspect of the Great Man theory from Victorian times stems from the fact that history returned to public favour during the Romantic movement, and stories of historical heroes held the youthful imagination. Scientific hero building can be located in the language used to describe scientists.

We have already seen that Tyndall described Faraday as a “just and faithful knight of God”, perhaps mimicking an article in Dickens’ “Small Beer Chronicles”, where engineers were likened to “knight-errants of old”: “Could anything be more romantic than the story of their conflicts with the water spirits and the gas demons down in the underground of London?”<sup>1153</sup> Also in “Small Beer Chronicles”, scientists were described as “High Priests” who worship in the temple of wisdom, and seek to extract secrets from the oracle for the benefit of the congregation.<sup>1154</sup> While the latter harkens back to Seneca’s idea that the scientist in the temple of the world must behave like a believer in the temple of God, Dickens’ language is more fanciful than reverent.

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<sup>1152</sup> Ostry, “Social Wonders,” 65.

<sup>1153</sup> Ibid.

<sup>1154</sup> Ibid.

#### 5.4.1. Scientific reality in myth

There are other forms of science myths. Pupin draws parallels between ancient myth and science, as he does when he compares the steam engine to Prometheus, which is reminiscent of the neoplatonic even Pythagorean tradition where the (usually scientific) truth was veiled, or hidden, in myth. He even refers to the “impenetrable *veil* of this eternal background” contemplated “in our research of physical phenomena”.<sup>1155</sup> We have seen the theme of the veil in an earlier chapter, but here wish to reconsider it in terms of myth.

Hadot writes that for Porphyry, the body of myths assembled under the title “fabulous narrations” tells the truth beneath the veil of fiction because it is susceptible to an allegorical interpretation that is able to discern a truth hidden within a myth.<sup>1156</sup> For Porphyry, then, myth is traditional narrative that tells the story of the gods and in which we can discover allusions to the divine in that animate nature.<sup>1157</sup> “The demons that preside over Nature reveal their gifts to us, waking or sleeping, by means of certain fictive apparitions, by giving obscure oracles, signifying one thing by means of another, causing that which has no form to appear, thanks to similitudes endowed with forms... Their procedures fill the sacred ceremonies and mystic dramas in the places of initiation, dramas which act, precisely... by that very aspect which is secret and unknowable.”<sup>1158</sup>

This language is similar to Pupin’s when discussing the Theory of Relativity, when he writes of the “never-dreamt-of possibilities” that were now “held in view” by Electron Physics, and he asks, “why shall we not some day learn this great secret from the stars ? The language of the stars has many deep secrets to tell; it mystifies me just as much to-day as it did on the pasturelands of my native village fifty years ago.”<sup>1159</sup> The language is first revealed to initiates: “To-day we know that new physical concepts requiring a new

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<sup>1155</sup> Pupin, *Immigrant*, 383. Emphasis added.

<sup>1156</sup> Hadot, *Veil*, 52.

<sup>1157</sup> *Ibid.*, 53.

<sup>1158</sup> *Ibid.*, 69. He explains how he understood this passage to have been derived from Porphyry.

<sup>1159</sup> Pupin, *Immigrant*, 356-7.

language for their expression had to be created in the minds of scientific men before the modern electromagnetic doctrine could be revealed to the world.”<sup>1160</sup>

Even in Emperor Julian’s pagan apologetics, it was only the purified who could reach the meaning of myth and rite through allegory.<sup>1161</sup> According to Julian, what is paradoxical and monstrous in myth doesn’t leave us alone until, under the guidance of the gods, light appears to the intellect.<sup>1162</sup> Similarly, Pupin argues that although we might never lift the veil, the attempt in that direction, the cultivation of the belief in the reality behind the veil, is what will help contribute to the creation of an ideal democracy, in which the activities of each individual will be coordinated like cells in a body.<sup>1163</sup> He writes of the importance of this belief, as opposed to those “pessimists” who question the development of the “wicked world” but argues for the meaning and beauty of working towards order out of whatever chaos man is faced with.<sup>1164</sup>

It is possible to return to the Victorian Faustian myth in the context of the ancient traditions involving myth and science that warned of transgression in terms of man’s unchecked impulses. Momus (*Mōμος*) for example, was criticism personified, and the god of writers, ready to mock or censure them. But there was ultimately only one way to humiliate man in his arrogance and limitless audacity, and this was to fill him with worries. In this way, Prometheus means both “foreseer” and “worried”.<sup>1165</sup> By contrast, in Pupin’s interpretation of Prometheus, transgression is absolved when man retains awe of the universe and views scientific knowledge as a gift from God, as opposed to something taken for granted. Also, a symbol of that which humbles Pupin’s pride is not a god like Prometheus, but the old ways of Europe and Idvor, teaching him to temper his over-strenuous ways and vanity, his mother teaching him to see the humility of man in relation to God: in fact, after she passed away, he writes her very memory caused him to remember humility.<sup>1166</sup> In this scheme of things then, it is the history of the old world and the

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<sup>1160</sup> Pupin, *Immigrant*, 219.

<sup>1161</sup> *Ibid.*, 71-2.

<sup>1162</sup> *Ibid.*, 74.

<sup>1163</sup> *Ibid.*, 383-4.

<sup>1164</sup> *Ibid.*, 384.

<sup>1165</sup> *Ibid.*, 145.

<sup>1166</sup> *Ibid.*, 149, 160, 245, 255.

matriarch pointing to the stars of God that induce humility, saving Pupin from any need for cautionary myths.

As we have seen thus far in this work, in the ancient world, poetry was given greater credence over (the science of) history, for in the ancient world, it was believed that only the gods know the truth.<sup>1167</sup> Just like Pupin writes that God's eternal truth may never be known by man.<sup>1168</sup> The classical narrative form includes a space for morals that an unchecked passion for 'empiricism' does not. Pupin's insistence on ideals creates a space in his dialogue to explore morals alongside the science, such as when he speaks of science as both a pure intellectual<sup>1169</sup> and spiritual discipline.<sup>1170</sup>

Two myths emerged in the 21<sup>st</sup> century (where 'myth' means "true stories" as per Elaine, or "natural commonplaces" as per Barthes) connected to such tensions regarding how or why science was conducted, as mentioned earlier in this work: the myths of applied and pure science. Pupin was a supporter of pure science, for he acknowledged the problems that would emerge when scientists did not retain their intellectual independence from their industrial sponsors.<sup>1171</sup> Helmholtz gave precedence to this idea when he wrote that, "Whoever in the pursuit of science seeks after immediate practical utility may rest assured that he seeks in vain."<sup>1172</sup> Disinterested, abstract, "pure" science is necessary to more fruitful discovery. This position was expressed in the 1914 position that "we must show how the investigations of Faraday, pursued for the pure love of truth and apparently of no commercial value nevertheless laid the foundation of electrical engineering. If we can disseminate such knowledge... we can multiply the friends of pure science and secure new and large endowments."<sup>1173</sup>

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<sup>1167</sup> Hadot, *Veil*, 158.

<sup>1168</sup> Pupin, *Immigrant*, 383.

<sup>1169</sup> *Ibid.*, 374, 376.

<sup>1170</sup> *Ibid.*, 377 (in terms of the spiritual added to the pure material, intellectual pursuit), 378. Also see 358: "The university and the industrial laboratories are mindful of Rowland's admonition: 'In choosing subjects for our investigation, let us, if possible, work upon those subjects which will finally give us advanced knowledge of some great subject.' What subject can be greater than eternal truth, and that aim, according to my definition, is idealism in science."

<sup>1171</sup> Pupin, *Immigrant*, 285-6; abstract science and industry were to collaborate 261; only once idealism is in place, can industry be a help: 340-2.

<sup>1172</sup> Hermann von Helmholtz, *Academic Discourses* (Heidelberg, 1862), qtd. in *Science* 55, (1922): 408.

<sup>1173</sup> George Ellery, qtd. in Kline, "Constructing," 205.



Rowland—cited by Pupin in his autobiography in this very context<sup>1174</sup>—wrote that he was “tired of seeing our professors degrading their chairs by the pursuit of ‘applied science’ instead of ‘pure science’” which he upheld as a pedagogical ideal that cultivated moral character.<sup>1175</sup> He objected to professionals in the field of the physical sciences setting a bad moral example by profiting from doing applied science instead of cultivating their proper field of pure science, which he considered the source of all technological innovation. He elevated pure science above applied science by saying that Archimedes was right to have considered his engineering feats ignoble in comparison to his work in geometry. But pure science enabled applied science to produce material comfort and wealth “which may be again employed to further pure science. So the two react on each other to produce that perfect whole, modern science, pure and applied.”<sup>1176</sup> Pupin, though arguing for idealism, as we have seen, explicitly stated the need for well-funded research laboratories.<sup>1177</sup> It is difficult to separate the two, and Thomas Huxley expressed this when he wrote that it was a fallacy to think that applied science could be separated from pure science: “I often wish this phrase ‘applied science’ had never been invented. For it suggests that there is a sort of scientific knowledge of direct practical use, which can be studied apart from another sort of scientific knowledge, which is of no practical unity, and which is termed ‘pure science’.

But there is no more complete fallacy than this. What people call applied science is nothing but the application of pure science to particular classes of problems.”<sup>1178</sup>

Essentially, these are myths with different epistemologies. But it can be further argued that each age has its leading epistemology. Kline writes that the “gospel of industrial research” only transformed and did not replace the “gospel of high culture and pure science” by 19<sup>th</sup> century educational goals ceding to utilitarianism, whether commercial or political.<sup>1179</sup>

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<sup>1174</sup> Pupin, *Immigrant*, 353-4.

<sup>1175</sup> Kline, “Constructing,” 199.

<sup>1176</sup> *Ibid.*

<sup>1177</sup> Pupin, *Immigrant*, 341, where he advocates for a “well-organized and liberally supported research laboratory”.

<sup>1178</sup> Qtd. in Kline, “Constructing,” 194.

<sup>1179</sup> *Ibid.*, 209.

“Pure science” was used as a motive to raise money or elevate the status of engineers.<sup>1180</sup> The last chapter of Pupin’s autobiography is very close to giving such an impression, particularly where he argues in favour of the NRC and related national defense strategies.

Regarding the latter, it Pupin was in favour of national defense, it was because he was opposed to the oppression of Austria and in favour of the rights to existence symbolically forwarded by America—this is the message conveyed by the “total effect” of his autobiography. His motives, in other words, were not primarily material. Indeed, this is supported by Kline, who points out that Pupin’s views were even carried forward by one of his most successful students, Gano Dun, who wrote, “engineering is not a science, for in science there is no place for the conception of utility. Engineering is a scientist’s handmaid following after her in honor and affection, but doing the practical chores in life.”<sup>1181</sup> It may be forward that a contemporary interpretation of Heraclitus’ *being unveils as it veils*, the game of Dionysus, which both creates and destroys the most precious things, is the interconnection between money and science, where the material battles the idealistic eternal, perceived only by the initiate.

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<sup>1180</sup> Kline, “Constructing,” 210.

<sup>1181</sup> Ibid., 203-4.

## 6. Pupin's Poetry for the Future

One of the answers that we have been filling in throughout this work is how a rereading of Pupin today can help construct useful paths forward: in terms of narratology, science, nation. Nuremberg scholar Philip Camerarius' writes that, "when one considers the past and pays attention to the present, one can draw reasonable conclusions about the future. The present is a riddle, which time solves."<sup>1182</sup> In line with this, an attempt has been made to consider the past and the interim in order to solve the riddle of Pupin's role in the present. One of the attempts made, particularly in the chapter on mystery, was to show that even paths that look closed may in fact be open through suitable interpretation, and it was suggested that such open-ended interpretation is connected to the workings of poetry. This could also be termed in Petrović's definition of the metaphor and allegory, where discoveries are progressively made by extending that which is known. Considering the future one such extension, we may understand Pupin's foresight through his drawing on what is known through the wisdom of the past, and in this way presenting an alternative to many of the extant assumptions of the future.

One of the ways the history that lapsed between Pupin's present and our own has been defined is through the presentation of history as myth and the suggestion that certain approaches, like scientific rationalism and Whig history may also be considered a myth, albeit a myth that curiously denies the relevance of myth. Gadamer has shown that despite 19<sup>th</sup> century positivism, the meaning of incipience is the possibility of there being many possible eventualities, not just one or few, as we saw earlier. We have also seen that we are never pure observers, because we are always involved in our own tradition. The problem of bias was acknowledged in some of the scientists' autobiographies we examined. Therefore, claims of objectivism in the humanities are questioned, together with their de facto expectations of progress. By way of alternative, Burke writes about the importance to replace notions of progress with notions of a norm that nonetheless require a tireless work of reconsidering how to restore sources in new ways in the present so as to maintain aspects

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<sup>1182</sup> Qtd. in Jill Kraye, *The Cambridge Companion to Renaissance Humanism* (Cambridge : Cambridge University Press, 2003), 216.

of the good life that would otherwise be lost.<sup>1183</sup> Pupin himself did this, as we have seen, so in this respect, a rereading of his work beckons us to do our own work of reconsidering applications of what has already been learned in history to the present, forging our own metaphorical bridges forwards.

The Greeks knew that ideals were but intellectual abstractions, at best used as measurements for our goals. This was how Pupin saw them, tempering his ideals with a conditional “if.” There are many modern theories that take as their premise the possibility of the attainment of perfection. Until recently, that was a myth—as implied by the word utopia, a place that is not a place. Randall writes of romantic idealists that they were the only thinkers in modern times to be concerned with wisdom and the formulation of the good life, “that shall include all the facts and values”.<sup>1184</sup> Such an idealism seeks possibilities through an acceptance of limitations, understanding science less as a literal truth and more as a subject for symbolic interpretation. It: “is an imaginative and symbolic rendering of life, illuminating its possibilities, rather than describing its actual limitations... What they proclaim is rather a faith, in faith that will give meaning to life. It is the claim of the idealists *that science is not the literal truth either, that all renderings of experience are symbolic interpretations*, that all discourse and all knowledge is a metaphor... idealism is not a science, but imagination, poetry, and art and so is science.”<sup>1185</sup>

He designates such systems as mythologies to be judged in terms of the quality of life they lead to. As this is arguably the “total effect” of Pupin’s autobiography, which seeks a quality life for all as we have seen in his ideals at the end, we shall continue to do our own work in reconsidering the sources of this good life and the classical parameters that we have seen to have informed his view.

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<sup>1183</sup> Burke, *Permanence*, 163: “We must replace the metaphor of progress (and it’s better corollary, decadence) with the metaphor of a norm: the notion that at the bottom the aims and genius of man have remained fundamentally the same, that temporal events may cause him to stray far from his sources... but that he repeatedly struggles to restore, under new particularities, the same basic pattern of ‘the good life’... What is necessary, permanent, valuable may be lost or lost sight of or dismissed in the course of the inevitable changes of history.”

<sup>1184</sup> Randall, *Naturalism*. He further posits, “Theirs are the only ideals worthy of comparison with those of the Greeks or the Medievalists”.

<sup>1185</sup> Ibid. Emphasis added. He adds: “Romantic idealists like Fichte make no claim to the possession of literal truth: Kant had banished for them that illusion.”

To return to Plato, myths are not mere stories, but rather illustrations of concepts and reflections. The capacity for truth and falsehood both in our will to know and in our being-with-one-another is a peculiarity of the human being. We seem to make stories as much as we are in life even if not all of these stories lead to the good life. Much is to be said of the orientational power of narrative in terms of experience. Randall explains about the mistake of taking idealism too literally, seeing it as an achievable goal instead of a general orientation: “There is a constant temptation to live *in* the vision, rather than *by* the vision: to want to go to Heaven, like the Christians, or to bring Heaven here to America, like the moderns, instead of using the vision of perfection to discriminate between what is better and what is worse in our relatively and inevitably imperfect world... This, it may be, is the truth that lies behind Plato’s ironical warning that the effect of poets is often bad: because men are apt to be too stupid to realize that they *are* poets, and take them literally instead of seriously.”<sup>1186</sup>

Pupin did not take his ideal democracy literally; we remember that he did not claim it was definitely possible, but outlined it as a general mode for the organization of employment in a nation, for something is to be done “creatively” if we are not to be consumed by defeatist nihilism or “pessimists.” Therefore, a reading of Pupin releases us from projections of the future and returns us to an open present. As per Pupin’s vision, this present is enriched by looking to wisdom from the past to inform a way forwards: using whichever institutions one has, just as Pupin applied his idealisms to those of his age, like the NRC. As Randall wrote, idealists rather than claim science is a literal truth see, rather, “that all renderings of experience are symbolic interpretations, that all discourse and all knowledge is a metaphor... idealism is not a science, but imagination, poetry,” and this is ultimately what we can take from Pupin, and what combines his views on nation and science to literature: the poetry of the idealist’s vision, extracting the best from every field and situation.

Pupin’s autobiography responds to the multiple levels of linguistic activity: from the factual, to the empirical, to the various strands of myth—which includes the *vila* who

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<sup>1186</sup> John Herman Randall, “Plato’s Treatment of the Theme of the Good Life and His Criticism of the Spartan Ideal,” *Journal of the History of Ideas* 28, no. 3 (July - September 1967): 307-324, accessed September 5, 2011, <http://www.jstor.org/stable/2708621>.

emerges from the Serbian ballads, entering the narrative to assist Pupin in his labours,<sup>1187</sup> to mythical presentations of Lincoln, who is indelibly tied to the myth/ideals of America. In this way, his narrative thematically, not just stylistically, enters streams beyond itself, into the timeless<sup>1188</sup> realm of myth and the ideal. Here, we are to recall the definition of poetry given in this work: to attempt to reflect the workings of the universe (from ethics to science), to “be with it”, to point to a hierarchy of values in life, to see connections between the superficially disparate and thus overcome Pope’s Empress of Dullness.

Besides these poetic myths is the practical business of getting by in life. It has been said that we always believe the clouds to be much higher than they really are until we see them resting on the shoulders of the mountains.<sup>1189</sup> Thus Pupin writes, “I saw there was another Lincoln, delighted in jokes, with which Lincoln tried to sweeten his life’s experiences.”<sup>1190</sup> And to this effect, the narrative arc of Pupin’s story is not unlike an illustration of how to reach the good life, as, by way of just one illustration from his autobiography, a Serb studying dilligently in the Scottish Highlands yet allowing himself to be persuaded to dance. It is possibly through his humanness that Pupin’s story is admired by so many different readers from different backgrounds. Pupin himself, i.e. not just his narrative, becomes a mythical figure for having reached fulfillment and achievement during his life: Velimirović describes him as an “uistini Olimpijskog čoveka. To je ono šegrče, ko je nekad sa fezom na glavi zurio ulicama onog modernog Vavilnoa”.<sup>1191</sup> Velimirović also recalls that a lawyer from Wall Street wanted to thank him for his efforts and had even wanted to offer Pupin a sum of money for he considered that he had learned so much from him and garnered, in that way, so much spiritual strength.

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<sup>1187</sup> Pupin, *Immigrant*, 47-58, 80, 88

<sup>1188</sup> Claude Levi-Strauss, “The Structural Study of Myth,” in *Structural Anthropology*, trans. Claire Jacobson and Brooke Grundfest Schoepf (New York: Basic Books, Inc., 1963), 209, accessed October 8, 2012, <http://www.scholarcache.com/wp-content/uploads/2011/04/Levi-Strauss-The-Structural-Study-of-Myth.pdf>.

<sup>1189</sup> Sir Arthur Helps, *Thoughts in the Cloister and the Crowd* (London: J.M. Dent & Co., 1901), 3, accessed October 8, 2012, <http://www.thoughtsincloist00helpiald.pdf>.

<sup>1190</sup> “Revelation of Lincoln to a Serbian Immigrant: A Story.” C.U. Rare Books, M.S. 1035.

<sup>1191</sup> Velimirović, “O Mihajlu.”

The poetry in Pupin's narration is so strong that it permeates science: we begin with the cowherds and glimmering stony path "and star speaketh to star"<sup>1192</sup> and end with a discovery regarding the vibration of sound.<sup>1193</sup> What science can do, Pupin explains, is prose; what it is, is poetry.<sup>1194</sup> The ability to recognise the poetic side of poetry is, perhaps most crucially, a culturally-dependent vision. Pupin writes, "To ... every true Slav ... the poetical side of physical phenomena appealed most strongly."<sup>1195</sup> This argument is possibly supported by Petrović's scientific approach to the metaphor and allegory, and consideration of the similarities between science and poetry. Yet Pupin later writes that Milton's "Paradise Lost", Longfellow's "Hiawatha" or William Cullen Bryant's "Thanatopsis" had, "convinced me that the Slavs were not the only people who, as I had been inclined to think, see the poetical side of science, but that everybody sees it, because science on its abstract side is poetry; it is Divine Philosophy, as Milton calls it. Science is a food which nourishes not only the material but also the spiritual body of man."<sup>1196</sup>

Religion, like science, has "poetic beauty"<sup>1197</sup>—poetry being the expression of both. While the prose of matter is "impressive than its poetry", Pupin presents poetry as paramount, along with God. Pupin's mother says to him, "May God be praised forever for the blessings which you have enjoyed and continue to enjoy,"<sup>1198</sup> to which Pupin responds that it isn't strange that his mother's words would have such a strong hold on him despite his "expanding scientific knowledge" because, "that student was once a Serb peasant in whose early childhood the old Serbian ballads were his principal spiritual food."<sup>1199</sup>

Such poetic fodder is illustrated, again, in an incidence involving his mother and Idvor. It has already been related how a young piper playing his music on the eve of his wedding caused Pupin to become melancholic and doubtful of his scientific calling.<sup>1200</sup> Seeing her son thus, his mother Olympiada says, "I always believed that God has saved for

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<sup>1192</sup> Pupin, *Immigrant*, 18.

<sup>1193</sup> *Ibid.*, 19.

<sup>1194</sup> *Ibid.*, 76.

<sup>1195</sup> *Ibid.*, 76.

<sup>1196</sup> *Ibid.*, 102.

<sup>1197</sup> E.g. *Ibid.*, 67.

<sup>1198</sup> *Ibid.*, 195.

<sup>1199</sup> *Ibid.*

<sup>1200</sup> *Ibid.*, 168.

you a mission in life much higher than that of young Gabriel, whose happy lot you seem to envy... You are not far from the top and you cannot stop nor turn back now... Gabriel's magic flute and his mellow sefdalia (song of sighs) have turned your thoughts to things which are now in everybody's mind: to wedding-feasts and kolo dancing, and to other diversions which fill the hearts of Idvor's youth ... You are dreaming now... but you will wake up again..."<sup>1201</sup> His mother, too, was a poet: she also captured so well the youthful dreams of her son. She completed her instructive vignette with an allegory: "The blacksmith softens his steel before he forges it into a chain; you are just right for the blacksmiths of Cambridge."<sup>1202</sup> In this passage, Pupin's mother demonstrates through illustration the connection between words and life, and at the end, the need for the metaphor in explaining the good life.

Beecher is revered in Pupin's autobiography because he spoke in the simple statement of plain people, but was cultured "with all the embellishments with which the imagination of a poetical nature could clothe it".<sup>1203</sup> These are the same terms Petrović uses to distinguish poetry from science: the poet dresses up the "core" uniting facts that share an essence, to make it look more impressive. Both scientists, as the majority of those cited in this work, privilege the "simple language" of those cores or essences that reveal the truth of things.

Pupin himself wrote in simple language, and writes of telling "word pictures" on a voyage to Europe,<sup>1204</sup> which is an apt description of his evocative writing. Hence the *Oakland Times*' headline: "Mr. I. Pupin Has Had Career that Reads Like Story Book and is Leading Scientist".<sup>1205</sup> And the November 1922 "Notes on Scribner's Authors" reads, "Pupin is a poet: not as an arranger of harmonious syllables but a real poet, he had to invent. His epic, unsung in words, is written across the face of his planet."

Poetry is like an arrow pointing to a something greater. In this sense, we may reconsider a passage from the end of Pupin's autobiography that refers to the stellar

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<sup>1201</sup> Pupin, *Immigrant*, 169.

<sup>1202</sup> Ibid.

<sup>1203</sup> Ibid., 107.

<sup>1204</sup> Ibid., 143.

<sup>1205</sup> "Charter Day Speaker Man of Big Mark, Dr. M.I. Pupin Has Had Career that Reads Like Story Book," *Oakland Times*, February 21, 1926, C.U. Rare Books, M.S. 1035.



metaphor examined in some detail earlier in this work: “Fifty years ago, instructed by David’s psalms, I found in the light of the stars a heavenly language which proclaims the glory of God, but I did not know how that language reached me, and I hoped that some day I might find out. That hope was in my soul when I landed at Castle Garden. To-day science tells me that the stars themselves bring it to me. Each burning star is a focus of energy, of life-giving activity, which it pours out lavishly into every direction of the energy-hungry space; it pours out the life of its own heart, in order to beget new life. Oh, what a beautiful vista that opens to our imagination, and what new beauties are disclosed by science in the meaning of the words in Genesis: “He breathed into his nostrils the breath of life, and man became a living soul. The light of the stars is a part of the life-giving breath of God. I never look now upon the starlit vault of the heaven without feeling this divine breath and its quickening action upon my soul.”<sup>1206</sup> This passage echoes his mother’s words. Their words are thematically connected to other, greater values. This is an attribute of poetry: iconic augmentation, as outlined earlier.

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<sup>1206</sup> Pupin, *Immigrant*, 381-2.

## 7. Conclusion

The 1849 advice in *Aesthetic Papers*, a work cited earlier, that when criticism begins, every mind must make up his mind in relation to what is right and wrong, has in the modern age possibly become disregarded, if we consider that the modern man is more interested in exact science than experience or criticism.<sup>1207</sup> The author of that essay interestingly explains that while we idealise nations, we are not critical of them, and thus fall victim to what they really are: manifestations of power and passion, as in the case of Napoleon or Luther—a far cry from what they claimed to be: a harmonizing of the emotions and experience, which is the poet's and idealist's true dream. This is akin to Pupin's view of the nation, meant to be organized harmoniously through its three bodies of the intellect, aesthetics, and spirituality, all meant to coordinate man, delivering man from chaos.

Exact science fails when applied to society, as Vico wrote in *Scienza Nuova*, explaining that it was sheer madness to apply Cartesian logic to the social sphere. This failure was seen by some Victorians in the French example. Arnold reminds us of Étienne de Senancour's warning: *pouvoir faire sans savoir est fort dangereux*.<sup>1208</sup> Pupin did not see science and society as being governed by the same laws: rather, science was one of the three aspects meant to harmonise social activity.

While some Victorians saw France as a fallen ideal, they considered America to demonstrate, "theoretically at least, a pure critical basis... a free critique from the highest point of view". But the ideal modern state subjects the politician to constant criticism: "The source of power criticizes itself, reverses its own decisions, yet will not respect the statesman who changes with it." And so the crafty statesman will play to the audience, so to speak, having, "understood and executed our sinister will." Thus the man becomes servant to the greater mechanism of society.<sup>1209</sup> Pupin writes precisely about these dangers towards the end of his autobiography, citing the need for experts: not any man can do a job as well

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<sup>1207</sup> Ward, *Aesthetic*, 18. Also, arguably, struggle than beauty, *ibid.*, 22.

<sup>1208</sup> Arnold, *Culture*, 178. Also, Ward writes: "It's literary men seem to us analogous to the politicians of the Revolution, men of wonderful talent, of fearless mind, weighing every old institution, and, as it is found wanting, casting it aside; but suggesting in their room nothing practicable, finding in the end nothing but real passion and power," 17.

<sup>1209</sup> Ward, *Aesthetic*, 23.

as any other, training is required, and public opinion needs to be “enlightened” about the difference between an expert and the “clumsy product of political patronage”.<sup>1210</sup>

Despite Pupin’s warnings, the tone of his writing is generally optimistic in tone, and arguably American criticism in the 20<sup>th</sup> century became increasingly pessimistic. But Pupin’s writing is not a critique: it is a presentation of ideals—in science, literature, and culture. He saw the theoretical promise of American freedom. And like all ideals, these could be reached by those who had the vision to recognize in the chaos of experience those *tesserae* of value. Even Russell, who was candid in his autobiography about the difficulties he encountered in America arguably ultimately benefitted from it. He wrote his life history seemed a myth to his American love; Pupin’s life seems like one, too, possibly because reality can be stranger than fiction. In taking the risk to meet the country of Franklin’s electric spark with but a dollar in his pocket, for example, Pupin matched opportunity with the larger values he felt drawn to as a child. If we may revisit his early curiosity for science one last time, we may recall an incident not yet recounted in this work: the first time he learned of Franklin’s experiment.

When Pupin explained lightning as the passage of an electrical spark, the village elders took it as a heresy, repeating the legend that it was caused by St. Elijah’s car as he drove across the heavens. Pupin’s mother supported Pupin by saying the Holy Bible said nothing of such a legend, so Pupin could be right. Pupin thus saw America as a location for the truth: the unknown to which he would bridge, metaphorically, to the known of traditional Serbia—intact cultural entities that intermingle just as cultures do in Herder’s vision. In other words, for Pupin, America was a location of truthful discovery: it was a place where he could retain the belief system given to him by his mother and yet freely explore, with the resources to explore, the science that fascinated him. In this way, ‘science in America’ becomes a place for answers to essential questions (“what is light?”)—and brings Pupin closer to God, as per his mother’s maxim: “Knowledge is the golden ladder over which we climb to heaven” as we saw earlier.<sup>1211</sup>

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<sup>1210</sup> Pupin, *Immigrant*, 373.

<sup>1211</sup> *Ibid.*: “I include every knowledge ... which brings me nearer to God ... Just think of it, my son: God has been sending his messages from start to star, and, according to David, from the stars to man, ever since the

We have seen how Pupin's symbolic system came from his mother, and how she knew the principle of mimesis, whereby man is to imitate the divine. She used her faith as a Christian teaching of goals, ideal measurements, which man ought, though limited, to aspire towards. We are wont to think of Ruskin's 'modesty' as the measuring virtue, the virtue of modes, or limits.<sup>1212</sup> It is through contemplation of that which is greater than one that one may meet divinity (his mother says: "I go to church ... to look at the icons of saints. That reminds me of their saintly work and through the contemplation of their work I communicate with God. ... to communicate with the spirit of eternal truth").<sup>1213</sup> We are wont to remember Ruskin's 'conscience': not science, merely, but 'with science', science 'with us'.<sup>137</sup>

This may be compared with Claudel's poetic notion of "being with" or Petrović's argument that science and poetry are essentially the same in that they seek essences the similarities of which are to be perceived by the observer's mind.

How much Pupin's poetic approach to science could be termed "Serbian" is up for debate. It can be argued, however, that an "iconic" perspective, where this means a seeking out of symbols and ultimately ordering them on ever more abstract, "higher" levels is characteristic of the "Slavic" experience. We have encountered this in Rilke's view of Russia, in Kandinsky, and of course in Pupin. In Kristeva's definition of the Eastern European soul, she chose three categories: *per filium*, *hesychasm*, and the icon.<sup>1214</sup> symbolizing, respectively, unity in paradox, transformation, and a way of looking. This is illustrated in Pupin's mother's quote above. The icon remains creatively potent, regardless of whether predominantly characteristic of a given region or race.

Pupin inherited his mother's poetic sense, perfecting it in a narrative, to be passed down to posterity. As the inscription to Maxwell's Matter and Motion reads, λαμπάδια

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creation of Adam, employing the very same method and means which man, imitating the divine method, is beginning to use when he employs electricity to carry his message to a distant friend. Your teachers who gave you that knowledge are as wise as the prophets and as holy as the saints in heaven."

<sup>1212</sup> Ruskin, *Queen*, 135.

<sup>1213</sup> Ibid., 191.

<sup>1214</sup> Kristeva, *Crisis*, 138-155.

ἔχοντες διαδώσουσιν ἀλλήλοις ἀμιλλώμενοι τοῖς ἵπποις, the lamp of knowledge is passed on from person to person. Or, as Trilling writes: “keeping the road open”.<sup>1215</sup>

Pupin’s science is a science “with us”: schoolchildren can understand it. It bears the element of the mythical insofar as some of the themes are timeless: struggle, lessons, change, and so on. It fits in the modern tradition because while it is a classical type of myth (like the *Odyssey*, where, instead of helpful gods, there are the Serbian *vila*), it involves the very contemporary theme of science.

In popular academic thought, the myth of the Great Man (from *Odysseus* to *Newton*) has been replaced by the myth of great science: in the place of morality is invention, both social and technological. Habermas, for example, argues for a post-metaphysics in which science forms the basis of a rational understanding of self, morality, and law.<sup>1216</sup> But the fascinating problem in this view is that it is more exclusionary than, for example, Pupin’s view, which admits there is a rational component to society, but allows space for other views. Hence the ultimate meaning of his interculturality, which is not too complex to become popular because abridged versions of his autobiography were assigned as required reading in schools, as we saw earlier.

Davenport has written that “religion, science, and art are alike rooted in the faith that the world is of a piece, that something is common to all its diversity, and that if we knew enough we could see and give a name to its harmony.”<sup>1217</sup> We may conclude that the modern world view is not stipulated exclusively on science, as it claims, but on the question of where man stands in terms of chaos and coordination.

The body of Theory that has sought rupture is now being doubted by some as a valid tool in constructing meaning and a means for explanation. Theory claimed “to speak for true critique. The critique of realism—the naiveté of its faith in representation; its complicity with banal cultural narratives—was leavened by the sneaking fondness for realism that theorists themselves, even the most canonical, exhibited. Recall Barthes on

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<sup>1215</sup> Trilling, *Liberal*, 103.

<sup>1216</sup> Francis Fukuyama and Jürgen Habermas, “The European Citizen: Just a Myth?” *The Global Journal*, no. 11 (May 18 2012), accessed June 5, 2012, <http://theglobaljournal.net/article/view/695/>.

<sup>1217</sup> Davenport, *Geography*, 270.

Flaubert, Deleuze or Kristeva on Proust...”<sup>1218</sup> Theory may be but a rite of passage, a way to acclimatize to a world of advertising and late capitalism, a world in which one leads an “anomic precarious existence”. It resembles the labyrinth in terms of its structure of power and control, political in its claim of liberalism yet readiness to castigate the old forms. Insofar as this is a dialectics of provocation, to keep us from becoming settled or burdened with Arnoldian “machinery”, it is a good thing. Insofar as it is to be taken as a set of precepts, it is limited.

Pupin’s narrative shows that we can do without critique by focusing on the ideals, which is a far more gracious form of communication, and ultimately a more Christian one: *judge not, that ye not be judged*. On this note, we shall end by saying that through the fields of science, narration, and nation, Pupin was always looking towards eternal truths. It is argued that this central theme can never become outmoded, because ideals are constants, and also because the ways in which these ideals are explained in order to be comprehensible to each new generation must also change, and require creativity on the part of the narrator, who must perceive bridges between the changing present and those ideals. It is far easier to become dogmatic about ideals and make them into Arnoldian “machines”, no matter what they are (even what Ruskin would described as “corrupt” ones of atomism), than it is to allow for a free spirit of questioning. For another key theme in Pupin’s autobiography is communication: the star speaks to star, Pupin moves through different cultures, does his best to rid himself of prejudice, tries to progress in life and not let his old habits keep him from developing new ones. This is the promise of his interculturalism: to work out relevant ideas from different geographical locations, as we saw earlier. It is far easier, as Arnold writes in *Culture and Anarchy*, to fall prey to our ordinary selves than it is to learn something new. Thence why so few can be termed “intercultural”.

Pupin describes his mother joking with him about the lightning dispute he’d had with village elders on one of his trips home, saying, “that if my father and his old friends had still been living they would perhaps accuse me again of heresy on account of some old legends which clashed with my new knowledge; and she assured me that she would defend

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<sup>1218</sup> Dames, “Theory.”

me again.”<sup>1219</sup> This sentence shows how misplaced it would be to call Pupin’s narrative outmoded. He is surely the kind of free thinker the world needs more of today: a legend built on other legends, himself an allegory for old meeting new—worlds, cultures.

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<sup>1219</sup> Pupin, *Immigrant*, 244-5.

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### Author's Biography

The author worked her way through an undergraduate degree at Columbia University by working first at TIME magazine and then at the university, ultimately at a cross-departmental level. She won several awards for her poetry while at Columbia and is a published poet as well as journalist, having worked in both New York City and Hong Kong. Since 2001, the author has been living in Belgrade, working primarily as a lecturer at the University of Belgrade. The author has also translated a novel and many academic papers as well as copy edited for academic journals and other publications. In 2009, the author received with honours her MA from the University of Belgrade for a paper on Poglavlje Književnosti Nikolaja Velimirovica.

## Изјава о ауторству

Потписани-а

прој улписа

Изјављујем

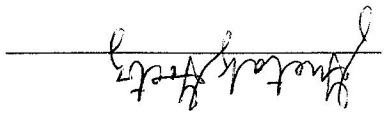
да је докторска дисертација под насловом

Исцрпљујуће истраживање о утицају на научно-истраживачку делатност наставника у средњошколским установама; наставника, наставника

- резултат сопственог истраживачког рада,
- да предложена дисертација у целини ни у деловима није била предложена за добијање било које дипломе према студијским програмима других високошколских установа,
- да су резултати коректно наведени и
- да нисам кршио/ла ауторска права и користио интелектуалну својину других лица.

Потпис докторанда

у Београду, 18.12.2014.г.



**Изјава о истовестности штампане и електронске  
верзије докторског рада**

Име и презиме аутора Јована Јеџ

Број уписа \_\_\_\_\_

Студјиски програм \_\_\_\_\_

Наслов рада Математички аспекти функција Микулаша  
Ментор проф. др. Александра Јерковић  
наука, историја, наука

Потписани \_\_\_\_\_

изјављујем да је штампана верзија мог докторског рада истовестна електронској  
верзији коју сам предао/ла за објављивање на порталу **Дигиталног**  
**репозиторијума Универзитета у Београду.**

Дозвољавам да се објаве моји лични подаци везани за добијање академског  
звања доктора наука, као што су име и презиме, година и место рођења и датум  
одбрањеног рада.

Ови лични подаци могу се објавити на мрежним страницама дигиталне  
библиотеке, у електронском каталогу и у публикацијама Универзитета у Београду.

у Београду, 18.12.2014.г.

Потпис докторанда  
Јована Јеџ

## Изјава о коришћењу

Овлашћујем Универзитетску библиотеку "Светозар Марковић" да у Дигитални репозиторијум Универзитета у Београду унесе моју докторску дисертацију под насловом:

Инверкуларно читање аутобиографије Михаила Цукина:  
 Мајка, нарађајућа, нарађа

која је моје ауторско дело.

Дисертацију са свим прилозима предао/ла сам у електронском формату породног за трајно архивирање.

Моју докторску дисертацију похрањену у Дигитални репозиторијум Универзитета у Београду могу да користе сви који поштују одреде садржане у одбраном типу лиценце Креативне заједнице (Creative Commons) за коју сам се одлучио/ла.

① Ауторство

2. Ауторство - некомперијално

3. Ауторство – некомперијално – без препада

4. Ауторство – некомперијално – делити под истим условима

5. Ауторство – без препада

6. Ауторство – делити под истим условима

(Молимо да заокружите само једну од шест понуђених лиценци, кратак опис лиценци дат је на полеђини листа).

у Београду, 18.12.2014.г

Потпис докторанда

*Mihailo Cukin*