

Gare, A. (2023). Challenging the Dominant Grand Narrative in Global Education and Culture. In: Rozzi, R., Tauro, A., Avriel-Avni, N., Wright, T., May Jr., R.H. (eds) *Field Environmental Philosophy*. Ecology and Ethics, vol 5. Springer, Cham. https://doi.org/10.1007/978-3-031-23368-5_19

Challenging the dominant grand narrative in global education and culture

Arran Gare

Abstract: This chapter critically examines the dominant tradition in formal education as an indirect driver of biocultural homogenization while revealing that there is an alternative tradition that fosters biocultural conservation. The dominant tradition, originating in the Seventeenth Century scientific revolution effected by René Descartes, Thomas Hobbes, Isaac Newton, John Locke and allied thinkers, privileges science, seen as facilitating the technological domination of the world in the service of economic growth, as the only genuine knowledge. This is at the foundation of a globalized, homogenizing culture that reduces everything and everyone to instruments of the globalized economy. The alternative, now recognized as the Radical Enlightenment, has its roots in the Renaissance. Represented by thinkers such as Giordano Bruno, Giambattista Vico, Gottfried Herder and Friedrich Wilhelm Schelling, it challenges such dogmatic scientism and upholds the value of diverse cultures, past and present. It offers an alternative tradition and model of education fostering imagination, understanding and appreciation of diversity in the quest for wisdom. It is a model of education which engenders respect for and appreciation of the value of different cultures, including indigenous wisdom with very different attitudes to nature, thereby developing the capacity to reflect on, question, criticize and overcome the homogenizing imperialism of mainstream modernist culture.

Keywords: Education, Scientism, Humanities, Vico, Herder

Introduction

As Elio Gianturgo, the translator of Giambattista Vico's *On the Study Methods of Our Time*, wrote in his introduction to this work:

We live in a Cartesian world, a world of scientific research, technology, and gadgets, which invade and condition our lives; of new disciplines, like cybernetics, sociometry, biometry; of new machines, like electronic computers, videos, satellites...In our milieu so intensely penetrated on the one hand by mathematical intellectualism, by science-worship, and, on the other, by an exacting pragmatic utilitarianism, the outcome has been the inevitable downgrading of the humanistic disciplines ... with consequences that are plainly visible in the educational curriculum and the criteria governing our young men's choice of profession (Gianturgo 1990, p. xxi)

Vico's address was published in 1709, seventy-two years after Descartes published his immensely influential *Discourse on the Method of rightly conducting one's reason and seeking the truth in the sciences* (1637) and twenty-two years after Newton, strongly influenced by Descartes, published his *Mathematical Principles of Natural Philosophy* (1657). The tone of Descartes' philosophy was conveyed in *Meditations on First Philosophy* published in 1641. In this work, Descartes began by claiming to make a clean sweep of all past influences, including what he had learned as a student, and to begin again from the very foundations, only accepting what can be known with absolute certainty, doubting everything and only accepting claims to knowledge justified through a rigorous method of reasoning. The wisdom of the ancients, along with those who studied them, was dismissed as little worthy of credence.

Vico had identified and diagnosed the totalitarian tendencies in Descartes' philosophy. These tendencies were manifest in the expansion of European civilization and are manifest today in pressures for

biocultural homogenization, destroying or dissolving indigenous cultures throughout the world of people adapted to their unique ecosystems. One of the most pernicious ways this takes place is through our education systems. However, it is also clear from Vico's writings, including his writing on education, that Cartesian thought was challenged, preserving and then developing older modes of thought. The nature of this challenge and how it developed and how it was and is still being resisted is still not well understood. In this chapter I will examine the historical background to current debates and current struggles. The education system is a major site for the imposition of cultural homogenization and for resistance to this homogenization. At present, the Cartesian tradition is associated with a commitment to economic growth through expansion of the market through techno-science, while resistance to it is now focused on efforts at ecological and cultural conservation. By telling the story of the reactions against the Cartesian tradition of thought I will attempt to convey its strength and how it has provided the foundation for opposition to this Cartesian tradition, but also how this challenge has been and still is being neutralized, particularly in the field of education. In this way I will attempt to identify the educational principles that could be built upon by those promoting biocultural conservation.

The Problematic Cartesian Tradition

While Descartes did not write explicitly on education, his claims for how knowledge is obtained had as much relevance to pedagogy as to science, and were duly recognized for this. Along with the work of Galileo, Hobbes, Newton, and Locke, Descartes laid the philosophical foundations of modern civilization by elevating experimental science and its claims to certainty based on a supposedly rigorous scientific method that supersedes all other discourses. The differences among these founding figures is minimal. Descartes argued that knowledge should be acquired through the application of a rigorous method, and that the purpose of knowledge is to control nature. Following Galileo, Hobbes argued for the application of a 'resolutive-compositive' method by which anything can be understood by breaking it down into its components and seeing how they can be put back together. Hobbes argued that all reasoning is adding and subtracting in the service of gaining control over things in the service of satisfying appetites and avoiding aversions. Subsequently, in the 17th and 18th centuries, the empiricists, beginning with Locke, gave a greater place to sense impressions in the foundations of knowledge, and instead of appetites and aversions, referred to pleasure and pain as motives. Later, in the 19th and 20th centuries, the positivists and then the logical positivists and other logical empiricists combined Descartes' rationalism with empiricism, using advances in symbolic logic to achieve this synthesis. The hidden agenda of all this is the basis of Modernity. As Stephen Toulmin (1990) argued in his study of Descartes, it was to counter the Renaissance quest for liberty and its associated civic humanism, and to establish efficient control not only over nature but over people and society.

In contrast to the Cartesian method, civic humanism was produced by the humanities. It was associated with the revival of rhetoric, history, and the arts. Initially the civic humanists ignored natural philosophy, but later it was associated with the rise of Nature Enthusiasm, the foremost exponent of which was Giordano Bruno, who radicalized Renaissance thought and along with republicanism, called for greater egalitarianism (Jacob 2003). The political opposition to this was developed by Hobbes in a radical way. Hobbes defended the concentration of power in the hands of an enlightened despot, with the rest of the population left to focus on commerce (Skinner 1998). In chapter 24 of *Leviathan*, Hobbes virtually invented modern economics, taking the economy as an entity in which money serves to distribute nutrients to its component organs. Newton and Locke diluted Hobbes' political philosophy by promoting rule by an oligarchy of the wealthy. The Renaissance's goal of humanity to free people from slavery to achieve liberty and developing their full humanity, was altered by Descartes and these British philosophers to maximizing the production of commodities to satisfy people's appetites.

The call by Descartes for people who could ignore the weight of tradition, and think and view the world afresh, relying only on their own reason and powers of observation, served to obliterate the values of the civic humanists. It generated what José Ortega y Gasset (1961) characterized as a new technicism and “mass-man.” “Modern technicism,” Ortega y Gasset wrote, “springs from the union between capitalism and experimental science” (p.82). Technicism in turn has produced mass man. “The actual scientific man,” he claimed, “is the prototype of the mass-man. Not by chance, not through the individual failings of each particular man of science, but because science itself—the root of our civilisation—automatically converts him into mass-man, makes of him a primitive, a modern barbarian” (p.83). As Ortega y Gasset observed:

In order to progress, science demanded specialisation, not in herself, but in men of science... [E]xperimental science has progressed thanks in great part to the work of men astoundingly mediocre, and even less than mediocre... The specialist “knows” very well his own tiny corner of the universe; he is radically ignorant of all the rest... We shall have to say that he is a learned ignoramus, which is a very serious matter (pp.83-86).

Ortega y Gasset observed that because scientists do have genuine knowledge of their little corner of the universe, and do genuinely contribute to advancing this knowledge, they have the self-assurance characteristic of the genuinely learned of the past and impose their ignorant views on others in a way that ignoramuses of the past would not have dared.

After having achieved major results in the natural sciences, the “scientific method” was brought to bear on the study of humans. This method marginalized the humanities, including history, and carried through modernity’s hidden agenda by fitting human nature and society into exact rational categories to achieve full control of people. First economics, then psychology, and later sociology became positive sciences deploying what they took to be the scientific method. Apart from the language of power and law, making known our will to others, as Hobbes (1985, p.102) put it, discourses that were “unscientific” were deemed to be mere speculation or expressions of personal opinion or of emotions, or just forms of entertainment and therefore not to be taken seriously.

Modern education has been transformed accordingly. The humanities have been on the defensive and, except for a revival in late 18th and early 19th Century Germany, have been losing ground ever since. Since the last quarter of the 20th century, public universities have been pressured to transform themselves into transnational business corporations run by managers, competing for students on the international market. As a consequence, in some universities the humanities and the sciences aligned with them are on the verge of being eliminated (Readings 1996). The strongest defense of the humanities has been provided by historians of science who have shown the self-image of science to be fallacious. The great achievements of science, including the work of Descartes and Newton, were built on ideas going back to the Ancient Greeks and beyond, and were achievements of great imagination. Positivistic forms of the human sciences based on this fallacious self-image of science, exemplified by neo-classical economics and behaviorist psychology, have been shown to be pseudo-sciences (Mirowski 1989). However, with academic specialization, even the capacity to understand this is lost. Formal education is dominated by a debased form of science and by “scientism” that equates science with knowledge accumulated through the application of the scientific method, with true knowledge. This is the triumph of what Karl Popper criticised as the bucket view of knowledge. Scientism reproduces this learned ignorance with fragmented knowledge, understood against background assumptions built upon an inconsistent mixture of positivism, atomism, and mechanistic materialism. Combined with an ignorance of history, this is taken to be the scientific worldview.

Today fragmented scientific knowledge is widely sold as a commodity. It is valued because it facilitates the development of technology, and so people are willing to pay for it. Scientific experts are

employable because they can develop military technology or make profits for companies, and education in science, technology, engineering, and mathematics can be sold because supposedly it produces employable scientific experts. Business studies teach students how to exploit these scientific experts and other workers efficiently, while economics legitimates the commodification of every aspect of life, thus legitimating the reduction of scientific expertise and knowledge to commodities. The success of such scientism is manifest in the exponential growth of the economies, now equated with progress, and measured as growth of Gross Domestic Product (GDP). Supported by government policies, scientism now dominates the curricula of students around the world, marginalizing all alternative claims to knowledge. The arts and humanities survive for the most part only as components of the entertainment industries. As noted in Harvard report on the decline in humanities majors and enrolments in USA (Armitage et.al. 2013, p.5):

Research has demonstrated that university disciplines must do at least one of three things to draw the support of university administrators. To be successful, the discipline must either (i) be devoted to the study of money; or (ii) be capable of attracting serious research money; or (iii) demonstrably promise that its graduates will make significant amounts of money.

Along with the humanities, local histories, and local traditions of thought are disappearing. This makes it almost impossible for people to understand themselves and their place in history or in nature. With the world facing a global social and ecological crisis due to the economic growth that this scientism is designed to serve, this one-dimensional culture could prove more disastrous than the cultural decay described by Ortega in the 1930s.

There has been a long history of resistance to this modern transformation of education, mostly, although not always, associated with defense of the humanities. "Humanities" as a form of education originating with Petrarch was the product of the Florentine Renaissance quest to inspire people to defend their liberty, and to develop the virtues required of citizens to govern themselves. While Renaissance thinking had been subordinated by the Seventeenth Century scientific revolution, it had not been extinguished. It survived as the Radical Enlightenment, opposing the mainstream Enlightenment inspired by Newton and Locke (Jacob 2003). The Radical Enlightenment came to fruition in Germany in what has appropriately been referred to as the German Renaissance (Watson 2010). Consequently, the most concerted opposition to Cartesian thought came from Germany where the Humboldtian model of the university developed in reaction to the atomistic, mechanistic, and utilitarian thought of France and Britain.

Wilhelm von Humboldt, the architect of this model, was committed to reconciling the sciences, the humanities and the arts to provide students with an integral understanding of the world as central to their self-cultivation or *Bildung*. German education subsequently was recognized as the best in world (Ben-David 1971, ch.7). However, here also, specialization destroyed this ideal, even within the humanities. It was this that ignited Nietzsche's furious reaction conveyed in his 1872 lectures on education, *Anti-Education: On the Future of our Educational Institutions*. However, while influential, Nietzsche did not really provide a solution to the problem. In heralding the 'overman', he simply promoted an extreme elitism and contempt for 'ordinary' people.

To get to the root of the debasement of education, and for culture to find a way out, the most promising path is to look at where things went wrong. Von Humboldt and those who influenced him clearly saw the problems facing modernity and the role that education should play in dealing with these problems. It would be worthwhile to investigate these thinkers and their views on education. However, before doing so it is necessary to go back even further in history to Vico, who confronted Cartesian thought at an earlier stage of its development when its assumptions could still be clearly seen and alternatives more easily formulated.

Giambattista Vico's Concept of Education: Defending the Humanities

Giambattista Vico (1668-1744) was a professor of rhetoric in the law faculty at the University of Naples. He was not only defending but also further developing Renaissance thought, the most important part of which was the revival of rhetoric and history. His views on education and his criticisms of Descartes were developed from this perspective. However, Vico did not merely counterpose a humanist legal education to a scientific education. He fully recognized the achievements of seventeenth century thinkers, including developments in mathematics and science. He followed Aristotle in arguing that different domains required different approaches, but he was against the fragmentation of knowledge. He argued that the ultimate end of education is self-knowledge. He proclaimed in his first inaugural oration, “[a]s a sphere rotates on its axis, so does my argument hinge on this: knowledge of oneself is for everyone the greatest incentive to acquire the university of learning” (Vico 1993, p.37f.) To this end, Vico argued that education should aim at developing a comprehensive knowledge of the world and that “young men should be taught the totality of sciences and arts” (Vico 1990, p.19). Vico firstly criticized Descartes’ interpretation of his own achievements. Secondly, but more fundamentally, he criticized Descartes’ failure to understand the preconditions for these achievements and what is required to go beyond them. These preconditions, historical and in each individual, are imagination and memory, and the capacity to deploy metaphors.

In his tract on education Vico first targeted Descartes, and in doing so developed his most important ideas. He criticized Descartes’ claim to have a method of invention, and that there is only one method of inquiry for all disciplines. He rejected Descartes’ claim that his analytic approach to mathematics, which was associated with his analytic geometry, was superior to the synthetic method, which was exemplified by Euclidean geometry. More fundamentally, he rejected Descartes’ characterization of human intellect in abstraction from human fantasy, passion, emotion, and imagination as well as its social and historical context. It was in defending these claims that Vico developed his most important idea – that we can only really know what we ourselves create.

Descartes believed that he had achieved certainty through only accepting clear and distinct ideas as in mathematics and mathematical reasoning, and extended this claim to certainty from mathematics to physics by claiming that the physical world is mathematical. Vico accounted for this certainty in mathematics by arguing that it is certain because we created it. However, the claimed identity of mathematics and the physical (world?) was belied by the failures in Descartes’ physics, as pointed out by Leibniz. Descartes had no justification for assuming that nature would conform to his mathematics. Only God who created nature could truly know its principles, Vico argued. What humans could really know is the social world produced by humanity. So in opposition to Descartes who evinced nothing but contempt for history, Vico argued that it is through history, studying the creation by humans of their institutions and themselves, that knowledge can be most fully obtained. To properly understand mathematics and science, we are required to understand their history. The new science referred to in his *Principles of New Science*, was a science of history.

In this history, Vico was concerned above all with the “birth” or genesis of “nations,” that is, the genesis of a people with a common language and other institutions, and then with how these evolved, not due to external causes but to internal stresses. He attempted to show how language itself originated and **then how the different forms language took with this evolution**. The ancients, he argued, were very different from the people of his own time, although “modern” people were ultimately products of the world the ancients had created. While Vico was particularly concerned to characterize the genesis and evolution of legal institutions and the development of language associated with these, his interests extended far beyond. He was also concerned to explain the genesis of philosophy, mathematics, and modern science. It was through the study of Ancient Greece and

Rome and the aboriginal people of America that he sought to show the preconditions of these, beginning with the development of language by people originally under the impulse of violent passions for whom “fables” were true narrations of things (Vico 1982, p.145). Vico argued:

[P]oetic wisdom, the first wisdom of the gentile world, must have begun in a metaphysics which was not rational and abstract, like that of the learned of today, but sensed and imagined, as that of these first men, devoid of reason and wholly composed of powerful senses and vigorous imaginations ... must have been” (p.209).

The most necessary and frequent trope of this poetic logic was metaphor, with the first metaphors drawn from the human body and its parts (p.223). The next tropes were synecdoche and metonymy, with synecdoche passing into metaphor, by the raising of particulars into universals.

The method for comprehending such genesis and to reconstructing the immanent dynamics of nations involves above all *fantasia* or imagination. Such comprehension reveals that not only does the abstract thinking of the modern world originate in the passions and imagination of early people, but is still dependent upon these, “sharing the poetic nature of their mother” (Vico 1984, p.123). This is evident in synthetic mathematics, and is only disguised by the analytic mathematics of Descartes and its derivatives. In the twentieth century, Vico’s argument in this regard has been supported by the constructivists or intuitionists in the philosophy of mathematics. Among these, Mark Johnson, George Lakoff, and Rafael Núñez have shown how mathematics is based on the imaginative use of metaphors, including very basic metaphors associated with body schema (Johnson 1987; Lakoff and Núñez, 2000). Vico argued that “abstraction is in itself but a dull and inert thing” (Vico 1990, p.39). Those who have inherited modern physics, the Cartesians, are like people who have inherited a “gorgeous mansion” leaving them only able to move the furniture around and add ornaments (Vico 1990, p.21). They are incapable of creative thinking. In practice, technology designed entirely on abstract principles associated with analytic thinking tends to result in “constant failure” (Vico 1990, p.29).

Following these observations, Vico argued that the most important precept for education is the injunction “know thyself,” which was equated by Vico to “know your own spirit” (Vico 1993, p.38f.). This is not achieved through introspection but through wisdom, requiring the entire curriculum of thought. Education of the young should be based on psychology, recognizing stages in psychological development that parallel the cultural stages traversed by humanity in its evolution. It should not introduce abstract reasoning too early into a child’s education, but rather should foster their imaginations and memory, thereby kindling their wills and sparking their enthusiasm. Imagination should be preserved even when students develop more abstract reasoning, preserving the ability to deploy metaphors and cultivating “the capacity to see analogies existing between matters lying far apart and, apparently, most dissimilar” (Vico 1990, p.24). The aim should be to grasp the whole of any situation and to put this into words. While arguing that students should be “well versed on all fields of knowledge” (p.78), Vico complained that education paid too much attention to science and not enough attention to ethics, most importantly, “that part of ethics which treats of human character, of its dispositions, its passions, and the manner of adjusting these factors to public life” (p.33). History is central to this.

Vico acknowledged that different nations originated at different places and in different times in different circumstances having very different experiences; consequently, their customs and thinking and very natures differed from each other (Vico p.148 1984). This is manifest in the differences between languages. While the study of history is required to comprehend human character as the foundation for ethics, this requires imagination that enables students to appreciate people different from themselves. It is not difficult on this basis to use Vico’s ideas on education to argue that each region of the world, having different customs and ways of thinking, requires a different education,

acknowledging their unique histories, circumstances, and associated practices and customs of where they were born. However, Vico did not take this step.

Herder and the Concept of Cultures

It was Johann Gottfried Herder (1744-1803) in Germany who acknowledged the diversity of cultures and defended this diversity, with important implications for education. Along with Johann Gottlieb Fichte, Herder was one of the most eminent students of Kant and immensely influential towards the end of the eighteenth century and a progenitor of the ideas which were embraced by Wilhelm von Humboldt. This influence has continued to the present, but has been marked by controversies and misinterpretations of his work by confusing it with later chauvinistic forms of German nationalism (Arnold et.al. 2009). Recent scholarship has eliminated most of this confusion, and Herder is now recognized along with Vico as one of the greatest proponents of education in the humanities and its importance for life and society (Wiborg 2000; Sikka 2011, 98ff.).

Herder had also a major influence on the development of post-mechanistic science, including geography, and through this, ecology (Tang 2008, chap.3). He also had an enormous influence on the development of cultural anthropology, leading to appreciation of the cultures of indigenous populations. As H.B. Nisbet (1970) has shown, he did not ignore developments in the natural sciences but embraced and further developed challenges to Cartesian and Newtonian cosmology. While this involved an alliance with Leibniz and those influenced by him, as part of the Radical Enlightenment Herder was reviving the cosmology of the late Renaissance natural philosopher Giordano Bruno (Singer 1950, 195). Herder was central to what has been called "Europe's Third Renaissance" and "The Second Scientific Revolution" (Watson 2010).

When he formulated his own ideas, Herder had not read Vico's work, although he would have heard of him. Clearly, there was much in common in their concerns and their philosophies. Both were reacting against the Cartesian tradition of thought and, privileging history over science, both emphasized the differences between peoples. Like Vico, Herder attempted to explain the emergence of language and then the development of humanity through history (Herder 2002). Both argued for the primordial role of metaphors in language and thought. When it came to history, both focused on the life of communities rather than the exploits of individuals. In opposition to the atomic individualism of Britain and France, Herder argued for the supreme value of belonging to a group defined by its culture. It is only through membership of groups, most importantly, a "nation," that people develop their individuality. A "nation" as Herder understood it, is an ethnic community and can include indigenous people. The development by individuals of their individuality is part of the development of the individuality of their nation.

Herder is generally known as an originator of the notions of historicism, nationalism and the *Volkgeist* [spirit of the people], and for his call for respect for all cultures by acknowledging the incommensurability among the values of different cultures and by appreciating these differences. However, he also argued that there is a general tendency through history to greater "humanity," that is, the realization of human potential for reason and justice. Progress was seen as the joint product creative legislators, poets, artists, philosophers, inventors and educators through the ages, leading to more benevolent government (Herder 1968, Chap. II; Sikka 2011). Growing respect for these differences should be recognized as part of the development of humanity.

While Vico focused on institutions and their development, Herder developed the notion of culture, using this word in the plural for the first time to acknowledge that different nations had different cultures. For the most part, this difference was terminological, since "culture" for Herder included the whole way of life of a people and so also included their language, their institutions, their traditions, and collective memories. Both Vico and Herder regarded language as the core of human communities.

However, Herder gave an even greater place to the differences between peoples, which included contemporaries as well as peoples of past eras. While Herder's notion of culture was a major contribution to history and to the humanities, Herder understood people in their geographical contexts as part of nature. These differences were seen by him to be related to "climate," including geographical and physical environments as well as biological needs in the formation of nations.

While being one of the original philosophers of nationalism, as Isaiah Berlin (1976, p.153) argued, Herder's nationalism was cultural rather than political. While ancient philosophers such as Plato, Aristotle, and Cicero had argued that people should be striving to realize their potential as human beings to become fully human, Herder argued that each nation and each individual has its own center of gravity and its own unique potential to be realized. The challenge for nations through individuals is to discover this center of gravity as part of the process of their self-realization. In this process of self-realization people express themselves in what they produce. Self-expression is the essence of being a human being, and in the quest for self-realization the challenge is to express oneself fully in one's work, being committed to it rather than divided and uncommitted. It is in this way that each nation, through the quest for self-realization by its individual members, makes its own contribution to humanity.

Consequently, Herder argued against imperialism, not only of the present but also of the past. He was unsympathetic to Roman imperialism. He wrote of Rome:

The walls that separated nation from nation were broken down, the first step taken to destroy the national character of them all, to throw everyone into one mold called "the Roman people." ... Foreign peoples were judged according to customs with which they were unfamiliar, presented with vices and punishments that they had never even heard of. And was not the ultimate ... outcome of this entire legislation, which was really only appropriate to the constitution of Rome, such a diminishment and debasement of the conquered peoples' characters, after a thousand oppressions, that instead of their original features, nothing remained in the end but the Roman eagle who, after pecking out their eyes and devouring their entrails, covered the sad corpses of the provinces with its feeble wings? (Herder 2004, p.22).

The advance of European civilization parallels what happened in Rome. Herder asks,

Can you name a land where Europeans have entered without defiling themselves forever before defenceless, trusting mankind, by the unjust word, greedy deceit, crushing oppression, diseases, fatal gifts they have brought? Our part of the earth should be called not the wisest, but the most arrogant, aggressive, money-minded: what it has given these peoples is not civilization but the destruction of the rudiments of their own cultures wherever they could achieve this. (Berlin 1976, p.160f.)

All this had implications for education. Herder was a superintendent of schools and strove to reform school education (Müller-Michaels 2010). He was an originator of the notion of education as *Bildung* – formation of character as a process of self-creation. Teachers should not be seen as imparting knowledge, but engaging with their students, stimulating their curiosity, and encouraging them to strive to realize their potential, achieving self-knowledge by understanding their unique place in history and in nature. While this should involve a quest for comprehensive knowledge that includes science as well as history, this should not obliterate the experience of each individual, which should be recognized as the starting point for this quest.

As with Vico, the development of language was accorded major significance in education. However, for Herder, each language is different, and this difference is extremely important. It is the prime repository of the wisdom of cultures, embodying the images, metaphors, and values of a people. "Has a nation anything more precious than the language of its fathers?" he wrote. "In it dwells its entire world of tradition, history, religion, principles of existence; its whole heart and soul" (Berlin 1980, p.165). While the quest for *Bildung* involves a quest to advance the whole of humanity, this quest originates in the specific culture and specific circumstances of each individual, with their own unique conditions and potentialities. This does not imply complete relativism. Herder argued that the quest for wisdom, including the development of science, can never be completed. Moreover, this quest can only advance through diverse perspectives being developed and by challenging each other while learning from each other. Herder was defending what, since the end of the twentieth century, has been defended by Mikhail Epstein (1995, p.299ff.) as "transculturalism" rather than "multiculturalism."

Von Humboldt, Schelling, and the Philosophy of Nature

Both directly, and indirectly, through German theologian Friedrich Schleiermacher (1768-1834) and philosopher Friedrich Schelling (1775-1854), Herder was a major influence on Wilhelm von Humboldt's views on education when he established the University of Berlin in 1810, privileging the humanities while supporting and aligning it with developments in the sciences. Von Humboldt's ideas on education made explicit and further developed Herder's notion of *Bildung*. To this end, von Humboldt argued that university education must combine teaching and research, with students participating in research, working with their lecturers rather than simply learning from them. The starting point for all enquiry, von Humboldt argued, is the quest for self-understanding, which ultimately leads to the quest to understand the cosmos. Education had to be an active, dialectical, process; it should involve and respect the perspectives of students. As von Humboldt argued:

... the inward organization of these institutions must produce and maintain an uninterrupted cooperative spirit, one which again and again inspires its members, but inspires without forcing them and without specific intent to inspire. ... It is a further characteristic of higher institutions of learning that they treat all knowledge as a not yet wholly solved problem and are therefore never done with investigation and research. This ... totally changes the relationship between teacher and student from **what is was** when the student still attended school. In the higher institutions, the teacher no longer exists for the sake of the student; both exist for the sake of learning. (Humboldt 1963, p.132f.)

While von Humboldt was more directly influenced by Schleiermacher, Schelling did have some influence through his work *On University Studies* (1966) published in 1803. However, Schelling's significance for advancing the humanist ideal of education derives from the success of his quest to produce a philosophy which could reconcile science with history and art. Building on Kant and Fichte, Schelling developed Herder's philosophy of nature and ideas on culture far more rigorously than had Herder, and in doing so, inspired developments in science that challenged and eventually replaced Cartesian dualism and Newtonian cosmology.

Kant had accepted Vico's argument that mathematics is a human construction, arguing that it requires productive imagination. Imagination was then given a central place in all cognition, including the development of science. Kant developed the notion of concepts to characterize the forms of intuition and categories of understanding. He claimed that he could show through transcendental deductions which concepts must be accepted to make our experience of the world intelligible.

Imagination, however, is also required to organize the sensory manifold, synthesizing appearances into a unity as the condition for subsuming these appearances under concepts and relating them to the unity of the "I". This empirical imagination is the condition for the productive imagination through which we can reflect on these appearances and the concepts through which they are organized. As a student of Kant, Fichte rejected Kant's strictures on what can be known, and claimed that as the productive imagination enables us to comprehend mathematics, we can also comprehend the cognitive development of children. Concepts first form through active engagement of the child against resistance, Fichte argued. He also argued that cognition has a social dimension because the 'I' that accompanies all our perceptions and thoughts develops through mutual recognition. The child comes to experience itself from the perspective of the other as a subject among other subjects. Instead of transcendental deductions, Fichte argued that these developments are creative, involving new syntheses made possible through imagination. Cognition is dialectical.

Schelling began as a disciple of Fichte, but took his arguments further, synthesizing them with Herder's philosophy. He argued that through the productive imagination we can reconstruct not only the cognitive development of humans, which always takes place within a particular culture, but the evolution of nature. Advancing Herder's philosophy of nature, he called for a transformation of science and new forms of mathematics. In opposition to Kant, who identified science with mathematical theories, Schelling defended natural history, recognizing the primacy of narratives over abstract models in comprehending the world.

Nature was portrayed as developing through the limiting of activity. Humans, as essential socio-cultural beings, could still be seen as having evolved within nature, bringing nature to consciousness. Embracing the notion of mutual recognition as the foundation of ethics, he characterized the history of humanity as the advancement of freedom based on the development of recognition. While acknowledging that we first develop concepts of nature in order to overcome resistance to our will, transforming it in the process, the development of mutual recognition and self-understanding as participants in nature grants a place to the quest for justice and wisdom as far more than instruments to control the world to satisfy appetites. The quest for justice and wisdom also justifies respect for the intrinsic value not only of other people but also of nature. While the mechanistic view of nature of Descartes and Newton served the development of technology, it was clearly deficient because it could not account for the emergence of sentient life and human consciousness. While Kant had given a place to concepts in cognition and defended a particular set of concepts, Schelling argued that it is possible to advance beyond received concepts and develop new, more adequate concepts to understand the world and ourselves. To this end, it is also necessary to study and recover the wisdom of past ages, and of diverse cultures throughout the world. There can be scientific revolutions. There is no end point to these dialectical processes. The quest for proper recognition and for knowledge can go on indefinitely providing people are willing to take up the challenge of developing new conceptual frameworks and new forms of life to overcome current contradictions.

In the past, Schelling's speculations on the philosophy of nature were regarded as of little significance. Work on the history of science has since revealed that almost all major advances in science since Schelling have been influenced by his philosophical reflections, including the first law of thermodynamics, the development of field theories in physics and the notion of valency in chemistry, major advances in mathematics along with developments in biology where Schelling is seen as a precursor to complex systems theory and biosemiotics (Heuser-Kessler 1986; Gare 2013). These in turn facilitated the emergence of new disciplines, including ecology, strongly influenced by Alexander von Humboldt's work in geography, and cultural anthropology based on Herder's notion that there are a diversity of cultures (MacIntosh 1985, 24; Tang 2008, 160ff.). In the Twentieth Century human ecology emerged through the synthesis of geography, ecology and cultural anthropology (Kormondy and Brown 1998).

The success of research traditions inspired by Schelling's philosophy of nature also vindicates Schelling's conception of science, which anticipated the arguments of the opponents of logical positivism, including Paul Feyerabend's argument that progress in science requires the proliferation of research programs and Alasdair MacIntyre's argument that narratives are required to defend major conceptual revolutions in science. That this achievement originated in Germany, refusing to accept the subordination of German culture to the intellectual centers of France and Britain, vindicated Herder's defense of national cultures and the need to resist the homogenization of national cultures driven by the dominant global culture. It revealed the value of diversity of cultures not only because the vitality of a nation derives from their specific cultures, but because it is the condition for the advancement of science itself. This vindicates von Humboldt's conclusion, influenced by Herder, Schleiermacher, and Schelling, that in the modern world it is possible to overcome the fragmentation of knowledge and to reconcile the sciences and the humanities. And it vindicates their notion of education as *Bildung*, the development of culture and character through participating in the quest to advance our understanding of the world, not as Cartesian minds standing outside the world, but as situated as participants within nature and based in a particular culture in a particular place at a particular time in history.

Conclusion

The quest for biocultural conservation is an extension of the values promoted by these disciplines of ecology, cultural anthropology and human ecology. Ecology challenged the view that nature is nothing but matter to be transformed to serve human purposes and rejected the claim that evolution occurs through the competitive struggle for survival. Evolution occurs through organisms and species interacting with each other so as to augment the environments of each, and to prosper, they must augment the health of ecosystems. This has generated ever more complex forms of symbiosis. Cultural anthropology countered the view of the social Darwinists that indigenous people are relics of the past, losers in the competitive struggle for survival, doomed to extinction (Bowler 1989, p.305). Human ecology integrated these perspectives, and it is this integration that justifies the call for biocultural conservation.

This has significant implications for education, because education is enculturation. Biocultural conservation implies that diverse cultures should be recognized, and this needs to be recognized in education practices. This is an extension of Herder's argument that those formed by their cultures should not abandon them, but appreciate their uniqueness and strive to realize their full potential. Education should begin with students studying the world around them and mastering local knowledge developed in their particular habitats. This does not mean insulating students from all other cultures, but building on their own culture while learning from other cultures. What is required is not multiculturalism, but transculturalism. This should be recognized to be the case even with science, where in the past advances in science were often due to new ways of thinking injected by scientists with different cultural backgrounds influenced by different practices and ways of living.

Today, however, the condition described by Ortega y Gasset, domination of intellectual life by overspecialized barbarians, the "mass-scientists" as opposed to broadly educated scientists, and the consequent corrosion of culture and diversity, is corrupting our education systems, research organizations and science itself as never before. With the transformation of educational institutions into business enterprises, the highest values have been devalued. The quest for wisdom is dismissed. Everything is defined in terms of economics, with the sole end being the growth of the economy. Knowledge is only valued insofar as it serves this growth. The new more efficient universities run by managers are producing more graduates than ever before, graduates who are not only uneducated in the traditional sense but, increasingly, are unemployable except precariously in jobs requiring little

education (Newfield 2008, p.4). If we look at science itself, there have never been more scientists or greater production of scientific papers, but in almost every field, including physics, the papers are frequently shoddy, and science has stagnated (Charlton 2012; Smolin 2006). Climate science, developed against strong opposition, is an exception. Efficiency has produced stagnation, not unlike the stagnation of the late Roman Empire.

The triumph and proliferation of these “neo-barbarians” has collided with the reality that humanity is on a trajectory to disaster through global ecological destruction, and as with other major problems, ineffective responses associated with tunnel vision are leaving us on the same trajectory. This has opened a space where we can question the claimed authority of these anointed hyper-specialists. These “mass-scientists” in Ortega y Gasset’s sense are nothing like the great scientists of the past. As Robert Root-Bernstein (2015, p.204) pointed out, great scientists typically are “endowed with an abundance of restless imagination, spend their energy in pursuit of literature, art, philosophy, and all the recreations of mind and body.” And as Joseph Ben-David observed, the sites of great intellectual achievements have been characterized by decentralization, facilitating the survival of a great diversity of schools of thought, as in Ancient Greece, Renaissance Italy, and Nineteenth Century Germany. Efforts to control such creativity has inevitably destroyed it. Epstein (1995, p.201) claimed that the greatest creativity occurs on the borders of cultures which challenge each other while retaining their integrity. The time is ripe for the recovery of genuine science.

In the spirit of Schelling, the theoretical ecologist Robert Ulanowicz (1997, p.6) now argues that developments in ecology could provide the forms of thinking needed to break through the logjams afflicting physics. This could advance all other disciplines, bridging the gap between science and the humanities and transform our understanding of our place in nature. It would also give a place to human ecology, and appreciation of the diversity of indigenous people with cultures adapted to their often unique ecosystems. Such arguments are part of the recent revival of natural philosophy (Gare 2018). In line with these developments, and to effectively confront the crises of civilization, most importantly, the ecological crisis, we need a radical redirection of education. This required direction has already been indicated by Vico, Herder, von Humboldt and Schelling, an education aimed at wisdom, fostering imagination and the quest for a comprehensive understanding of the world, ourselves and our place within it, cultivating humanity, and acknowledging and appreciating diversity and the significance of all life. Wisdom, including appreciation by people of their unique habitats and cultures, is now required more than ever to overcome the global ecological crisis.

Bibliography

Armitage, David et al. 2013. ‘The Teaching of the Arts and Humanities at Harvard College: Mapping the Future’, https://scholar.harvard.edu/files/jamessimpson/files/mapping_the_future.pdf (viewed 20th August, 2020)

Arnold, Günter, Kurt Kloocke and Ernest A. Menze. 2010. Herder’s Reception and Influence. In: A Companion to the Works of Johann Gottfried Herder. Ed. Hans Adler and Wulf Koepke, 391-420.

Beiser, Frederick. 1992. Enlightenment, Revolution, and Romanticism: The Genesis of Modern German Political Thought, 1790-1800. Cambridge, Harvard University Press.

Ben-David Joseph 1971 *The Scientist’s Role in Society: A Comparative Study*. Englewood Cliffs: Prentice Hall.

Bowler, Peter J. 1989. *Evolution: The History of an Idea*. Rev.ed. Berkeley: University of California Press.

- Charlton, Bruce G. 2012. *Not Even Trying... The Corruption of Real Science*. Buckingham: The University of Buckingham Press.
- Epstein, Mikhail. 1995. *After the Future*. Translated by Anessa Miller-Pogacar. Amherst: Uni. of Massachusetts Press.
- Feyerabend, Paul. 1975. *Against Method*. London: Verso.
- Gare, Arran. 2013. Overcoming the Newtonian paradigm: The unfinished project of theoretical biology from a Schellingian perspective. *Progress in Biophysics and Molecular Biology*. 113: 5-24.
- Gare, Arran. 2018. Natural Philosophy and the Sciences: Challenging Science's Tunnel Vision. *Philosophies* 3(33): 1-29.
- Gassett, Ortega Y. 1961. *The Revolt of the Masses*. London: Unwin Books.
- Herder, Johann Gottfried von. 1968 *Reflections on the Philosophy of the History of Mankind*. Chicago: Uni. of Chicago Press.
- Herder, Johann Gottfried von. 2002. *Philosophical Writings*. Edited and Translated by Michael N. Forster. Cambridge: Cambridge University Press.
- Herder, Johann Gottfried. 2004. *Another Philosophy of History and Selected Political Writings*. Translated by Iannis D. Evrugenia and Daniel Pellerin. Indianapolis: Hackett.
- Heuser-Kessler, Marie-Luise, 1986. *Die Produktivität der Natur: Schellings Naturphilosophie und das neue Paradigma der Selbstorganisation in den Naturwissenschaften*. Berlin: Duncker & Humblot.
- Hobbes, Thomas. 1985. *Leviathan*. Harmondsworth: Penguin.
- Humboldt, Wilhelm von. 1963. *Humanist Without Portfolio*. Trans. Marianne Cowan. Detroit: Wayne State University Press.
- Johnson, Mark. 1987. *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*. Chicago: Uni. of Chicago Press.
- Kormondy, Edward J. & Brown, Daniel E. 1998. *Fundamentals of Human Ecology*. Upper Saddle River: Prentice Hall.
- Lakoff, George and Rafael E. Núñez, *Where Mathematics Comes From*. New York: Basic Books.
- McIntosh, Robert P. 1985. *The Background of Ecology: Concept and Theory*. Cambridge: Cambridge University Press.
- Mirowski, Philip. 1989. *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics*. Cambridge: Cambridge University Press.
- Müller-Michaels, Harro. 2010. Herder in Office: His Duties as Superintendent of Schools. In: *A Companion to the Works of Johann Gottfried Herder*. Ed. Hans Adler and Wulf Koepke. Rochester: Camden House, 373-390.
- Newfield, Christopher. 2008. *The Unmaking of the Public University: The Forty Year Assault on the Middle-Class*. Cambridge: Harvard University Press.
- Nisbet, H.B. 1970. *Herder and the Philosophy and History of Science*. Cambridge: The Modern Humanities Research Association.
- Readings, Bill. 1996. *The University in Ruins*. Cambridge, Mass.: Harvard University Press.
- Root-Bernstein, Robert. 2015. Arts and crafts as adjuncts to STEM education to foster creativity in gifted and talented students. *Asia Pacific Educ. Rev.* 16: 203-212.
- Schelling, F.W.J. *On University Studies*. Trans. E.S. Morgan. Athens, Ohio. Ohio University Press.
- Sikka, Sonia. 2011. *Herder on Humanity and Cultural Difference*. Cambridge: Cambridge University Press.
- Singer, Dorothea Waley. 1950. *Giordano Bruno: His Life and Thought*. N.Y.: Henry Schuman.
- Smolin, Lee. *The Trouble with Physics: The Rise of String Theory, the Fall of Science and What Comes Next*. Boston: Houghton Mifflin.
- Tang, Chenxi. 2008. *The Geographic Imagination of Modernity: Geography, Literature, and Philosophy in German Romanticism*. Stanford: Stanford University Press.

Toulmin, Stephen. 1992. *Cosmopolis: The Hidden Agenda of Modernity*. Chicago: University of Chicago Press.

Ulanowicz, Robert E. 1997. *Ecology: The Ascendent Perspective*. New York: Columbia University Press.

Vico, Giambattista. 1982. *Vico: Selected Writings*. Ed. and trans. Leon Pompa. Cambridge: Cambridge University Press.

Vico, Giambattista. 1984. *The New Science of Giambattista Vico*. Trans. Thomas Goddard Bergin and Max Harold Fisch.

Vico, Giambattista. 1990 *On the Study Methods of Our Times*. Translated with an Introduction and Notes by Elio Gianturco. Ithaca: Cornell University Press.

Vico, Giambattista. 1993. *On Humanistic Education*. Translated by Giorgio A. Pinton and Arthur W. Shippee. Ithaca: Cornell University Press.

Watson, Peter. 2010. *The German Renaissance*. London: Simon & Schuster.

Wiborg, Susanne. 2000. Political and Cultural Nationalism in Education: The ideas of Rousseau and Herder concerning national education. *Comparative Education*. 36(2): 235-243.