Constructivist Pedagogy and Symbolism: Vico, Cassirer, Piaget, Bateson

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Abstract

Constructivism is at the heart of a pedagogical philosophy going back to Vico, whose view of the interrelationship of the arts and sciences sought to reconstitute the classical paideia. The Vichian idea that human beings can only know the truth of what they themselves have made has theoretical and practical consequences for Vico’s pedagogy and view of the university. Vico’s ideas on education are extended in the modern period by such thinkers as Cassirer, Piaget and Bateson. At the basis of Cassirer’s pedagogical philosophy is his theory of the symbol, the symbol being a universal and transcendent modality in culture. The result of this unifying theory is that symbolism, which is pervasive across the disciplines, provides a moral and ethical means for integrating communication about teaching. Cassirer’s thought is compatible with Piaget’s, which emphasizes the pluralism of experience and the role of dynamic learning in the construction of meaningful order. Piaget’s constructivism assumes that an operational bridge exists to link together the hard sciences, the human sciences, and the historical disciplines. This systems view of epistemological matters is similar in many respects to the one advanced by Gregory Bateson, which is explored in the paper’s final section.

Keywords: Constructivism, Vico, Piaget, Cassirer, Bateson

The true is precisely what is made’ (Verum esse ipsum factum) … . To know (scire) is to put together the elements of things. Hence, discursive thought (cogitatio) is what is proper to the human mind, whereas intelligence (intelligentia) is proper to God’s mind. (Vico, 1988, p. 46)

Vico

As Professor of Elocution and Jurisprudence at the University of Naples, Vico delivered seven inaugural orations to the faculty in the years 1699–1707. These addresses had the function of convoking the new academic year and allowed Vico a forum in which to define his pedagogy. The greatest of these, De nostri temporis studiorum ratione (On the Study Methods of Our Time), is a humanistic manifesto in defense of the interlocking system of the arts and sciences; the oration articulates the need for a positive—practical and theoretical—relationship between the academic disciplines. The ideas of the De nostri are continued in De antiquissima Italorum sapientia (On the Most Ancient Wisdom of the
Italians), an inspired work that includes the famous formula cited above, according to which human beings can only know the truth of what they themselves have made. We cite Vico’s assertion in the opening of this essay as an indication of our intent to tie this Enlightenment figure to the tradition of process thought and epistemological constructivism of the modern educators Ernst Cassirer, John Dewey, Jean Piaget, and Gregory Bateson.

Trained as a philologist, Vico’s concern was to connect the materiality of texts to a theory of knowledge that included creativity as a dynamic force in historical change. The linkage between thinking and doing, verum and factum, meant that linguistic signs were not static entities so much as dynamic participants in the ongoing pursuit of knowledge. As linguistic signs achieved endurance over time, they formed a symbolic lexicon that could be read as an historical map of the relationships between knowers and the institutions of knowledge, such as the academy or university.

In one of the most celebrated axioms of his *Scienza nuova* (New Science), Vico states: ‘The order of ideas must follow the order of institutions’ (1968, p. 78). Not only are human institutions the products of the cultures that form them; they are products of the collective consciousness, as are languages and other symbolic systems. Institutions possess their own internal coherence and virtues; they exercise a critical role in the lives and ideas of those who work within them. If this potential is not supported by the ongoing activity of those served by the institution, it loses its reason for being and brings down the ‘order of the ideas’. While Vico was committed to the university’s success, he had misgivings about its capacity for change. Innovation and erudition could work together only if one rejected arbitrary authority and recognized the equivalency of social organization and self-organization. Changes in the individual and changes in the academy could and should be interdependent and reciprocal.

For Vico, the university occupied a high place in society and was the guarantor of positive and mutually illuminating relationships between science, ethics, and the arts. Since the just institution and the just scholar require one another, it was an error to distinguish, in the pedagogical sphere, ‘the useful’ from ‘the honorable’ (Vico, 1993, p. 99). It was inconceivable that a university driven by political or materialistic motivations could attain its desired goals within the diverse disciplines of study. For the sake of a just education the professor needed to view knowledge from the standpoint of the learner and not as a static and authoritative corpus. Only in this way could the classical *paideia* be returned to its coherence and unity. The curriculum was not to be governed by Cartesian logic or ‘clarity’, but by prudence, knowledge, and eloquence, all of which depend on the intense cultivation of language. Thus Vico ‘opposes the encroachments of the mathematical method on nonscientific fields, and underscores the damage resulting from those invasions’ (Gianturco, in Vico, 1990, p. xxxi).

While Vico accepts the idea of the unity of the sciences, his understanding of that unity is different from Descartes’, as he is not concerned with the quantifiable sciences alone but with the theory of knowledge, or what we now call epistemology:

Arts and sciences, all of which in the past were embraced by philosophy and animated by it with a unitary spirit, are, in our day, unnaturally separated and disjointed. In antiquity, philosophers were remarkable for their coherence;
their conduct was in full accord not only with the theories they professed but with their method of expounding them as well. (Vico, 1990, p. 76)

Such a nascent epistemology of process foresaw the endogenous, self-derived nature of educational methods. One could not justify the extrapolation of a method from one discipline to another but needed to excavate within the discipline in question. Such internal probing within the operations and functions of a discipline was dynamic in character and required the learner to appropriate for herself the specific truths to be explored.

The mind-body split that arises in Descartes tends to exclude those aspects of phenomenal experience that are uncertain, ambiguous or otherwise resistant to scientific proof. Cartesian logic acknowledges only deductive proof, denying theories of causation that depend on probabilistic hypotheses: quantity is deemed as knowable, quality is not. Thus Descartes dismissed much of the experience of the arts, religion, and folklore as inconsequential—to knowledge. Among the many disciplines relegated to secondary status by Cartesian rationalism was rhetoric, a liberal art reclaimed by Vico together with the ‘topics,’ poetry, and history, as the basis of moral science.

Vico’s discussion of the patterns and stages of humanistic learning is an early demonstration of a dynamically integrated view of the humanities. ‘The greatest drawback of our educational methods—he writes—is that we pay an excessive amount of attention to the natural sciences and not enough to ethics’ (Vico, 1990, p. 33). Scientific language too was a form of symbolic thinking that grew out of the historical relationships between meanings. As Ernst Cassirer has remarked:

Giambattista Vico posed the problem of language within the sphere of a general metaphysic of the spirit. Beginning with the ‘poetic metaphysic’ which was intended to disclose the origin of poetry and of mythical thinking, he passed through the intermediary link of ‘poetic logic’, in which he strove to explain the genesis of poetic tropes and metaphors, to the question of the origin of language, which for him was synonymous with the question of the origin of ‘literature’ and of the sciences in general. He too rejected the theory that the original words of language were attributable solely to convention; he too insisted on a ‘natural’ relation between them and their meanings. (Cassirer, 1953, pp. 148–9)

Vico’s critique of contemporary scientism as a sterile form of logic that excluded the temporal theories of causation led him to formulate his new science, in which narrative and poetic logic were concrete means by which knowledge emerged out of the unconscious and was registered in language. This knowledge, or certum, emerges out of situations that involve the individual in crisis, discernment, and choice. Whether humanistic or scientific, it engenders a symbolic language intrinsic to its involvement in the social and historical reality. Because of the situatedness of the separate knowledges each with its particular terminology and semantic field, it is critical that educators be able to integrate their knowledge with the concept of the whole. Regrettably, writes Vico, the university faculty was comprised of divergent specialists unable to communicate with another, a fact that leads him to advocate for institutional reform: ‘Students’ education
is so warped and perverted as a consequence, that, although they may become extremely learned in some respects, their culture on the whole (and the whole is really the flower of wisdom) is incoherent’ (Vico, 1990, p. 77).

One of the primary fields in which Vico uncovered human symbolic behavior was myth. Myths could not offer moral guidance but could show one how society and the individual have interrelated over time. The study of myth and folklore requires that one adopt a theory of dialogue by which the teller and the told, the subject and object, are reciprocally disposed within a human context. For this purpose Vico studied the materiality of texts and surveyed the extant records of ‘characters’, a term he used broadly to signify mythic personages, the qualities they embodied and the graphic signs of written alphabets. His synoptic tables of ancient cultures in *The New Science* assessed these characters anthropologically, assuming the fundamental interconnectedness of diverse languages, ritualistic practices and religious belief-systems. A certain diffidence is called for when approaching Vico’s linguistic theories, since he was often inexact or allusive to the point where terms lost their precise meanings. We make no effort, therefore, to explore the specifics of Vico’s philosophy of language, preferring to not get involved in questions of the origins of language, cultural variations, theories of etymology or of the existence of a universal mental ‘speech’ shared by all humanity. Rather we focus on the general values of analogical thinking and hypothesis formation, and the idea of the *verum ipsum factum*—which Elio Gianturco has summed up by saying ‘knowledge is tantamount to operation’ (in Vico, 1990, p. xlii)—by which the Neapolitan philosopher anticipates the tenets of process studies and constructivism. Vico asked the following: Does the realm of the imagination and poetry, of history and rhetoric, enjoy the place it is due? Is truth appreciated as something experiential which depends on the perceptions of the knower and observer for its definitive form? Or do educators hark back to hidebound notions of objective clarity? Vico would argue that the exclusive reliance on deductive logic (characteristic of Cartesian rationalism and Baconian empiricism alike) alienated the learner from the cognitive adventure of the cultural group, the common narrative of human history and the *sensus communis*.

**Cassirer**

In the later 18th century, as scientists are able to collect superior data to that of their predecessors, the sciences acquire their own discrete symbolic languages. In mathematics one surpasses the Pythagorean theory for which the cosmos was ordered in perfect numerical relations; new formulations in chemistry and biology break with past schemes. In this changed climate, epistemology emerges as the study of the relations between the fields of knowledge, no longer under the yoke of philosophy.

While Vico’s thought was influential in the 19th century and was a precursor to the historicism that dominated the Romantic period, once that movement had exhausted itself in the modern period, Vico fell into relative obscurity. As Ernst Cassirer writes, while the philosophy of history was revolutionary in its linking of the facts of existence to the facts of the self, of the ‘thing-configurations’ and ‘I-configurations’ to which our ‘perceptual grasp […] of the world’ is bound, human beings continue to strive beyond
those facts and toward an ‘intelligible cosmos’ (Cassirer, 1996, p. 111). This cosmos cannot be described in images: ‘It can be conceived only in symbols, the symbols of language, art, religion and theoretical cognition’ (Cassirer, 1996, p. 111). Cassirer has identified symbol as the unifying feature in human endeavor and has summarized the protean forms in which it appears. As a universal and transcendent modality in culture, symbolic thinking exists in tension with the entropy and chaos of the world. Insofar as the languages of science depend on symbolic reference, Cassirer recommends that we expand the concept of objectivity to include what is known and represented in symbolic form. Though a follower of Kant, Cassirer’s concept of symbol goes beyond the representational; while retaining the concept of subjectivity, he opposes any form of subjectivism. In his chapter ‘Nature-Concepts and Culture-Concepts,’ Cassirer carries this discussion beyond the domain of pure logic and theoretical sciences to get to the structure of perception. He discusses the limits of objectivism and subjectivism as well as the narrowness of behaviorism, which lacks a theory of meaning. Behaviorism—also known as ‘learning theory’—lacks focus on interpretation and is too ‘associationist’ (Cassirer, 1961, pp. 150–51). As these limitations apply generally to learning, so they apply to moral learning.

Cassirer’s theory of the symbol is threefold, comprising sign, meaning and use. The defining moment in his formulation comes in the analysis of language. By returning to the actual material production of symbols, historically and cross-culturally, Cassirer aims at distinguishing what is properly human (and, in so doing, advances the work of Vico). If Kant had conceived of a gap between the mentality underlying symbolic production and the symbolic production itself, Cassirer sees these as existing on the same plane. In order to better grasp Cassirer’s terminology and his concept of the human, let us consider the example he cites of Helen Keller. In the deaf, dumb and blind woman’s learning process one sees the Cassirean distinction between the ‘sign’ and the ‘symbol’. While animals perceive and communicate with signs, only humans have the capacity to form symbols: ‘In short, we may say that the animal possesses a practical imagination and intelligence whereas man alone has developed a new form: a symbolic imagination and intelligence’ (Cassirer, 1970, p. 33). Cassirer singles out the case of Keller because her awakening into language, and the discovery ‘that everything has a name’, confirms the three different qualities of symbols: their universality, their variability, and their support of relational thought (1970, pp. 36–8).

Another thinker who studied the linguistic experience of Keller was Walker Percy, whose theories of the symbol are grounded in Peirce and his theory of triads. Percy defends symbolic practice from the reductive treatments that emerge from empirical behaviorism and abstract rationalism, both of which fail to acknowledge the symbol as a social communication and thus as the concrete sign of a relation. Percy (1984) remarks on the discovery by Helen Keller of the signifier ‘water’ as an act that could not be explained by behaviorists and required a theory of the symbol: by understanding that the letters ‘w-a-t-e-r’ palpated on one hand corresponded to the sensation coursing over the other, Keller tied the signifier to the signified and the referent. The discovery that this action was repeatable led to a heuristic pattern of learning involving the production of symbols. Keller’s accomplishment is remarkable because of her deafness and blindness, factors that discount traditional behaviorist rationales.
Cassirer’s approach to pedagogy seems especially valuable in addressing current debates, whether in the sciences, where empirical and sensationalist approaches seem to persist, or the humanities, where the problem of symbolic memory is often idealized instead of being related to ideas concerning humanity’s ‘symbolic future’ (1970, p. 55). It is important to affirm in this regard that a professional empiricism does not exclude the scientist from the moral realm. Scientists must be prepared to step beyond the data of science in order to accomplish an outward movement into society in which the ideas of science assert their morality:

The problem is to discover and develop a new viewpoint, to set up a new standard which cannot be reduced to that of empirical causality but which on the other hand is in no sense in conflict with it. Ethics demands that human actions are to be capable of and accessible to a double judgment; they are to be determined as events in time, but their content and meaning is not to be exhausted by this determinism. (Cassirer, 1957, p. 50)

The great relevance of Cassirer’s thinking is due to its presentation of symbolism as a cultural and epistemological rather than a metaphysical or ontological problem. As such, it is inevitable that symbolism and the notion of the actual (as opposed to the merely possible) will impact directly on questions of pedagogy. As Cassirer noted in discussing the uniquely human characteristic of ‘symbolic space’: ‘Not immediately, but by a very complex and difficult process of thought, [man] arrives at the idea of abstract space—and it is this idea which clears the way for man not only to a new field of knowledge but to an entirely new direction of his cultural life’ (1970, p. 43).

Piaget

One can cite a number of thinkers who, by exploring the boundaries between disciplines, exemplify Cassirer’s commitment to symbolism as a means to reinvigorate the academy. Emerging from their specializations, they possess the attitude of a double vocation and livelihood. An exemplary figure in this regard is Jean Piaget. Also inspired by Kant, Piaget introduced genetic epistemology as a constructivist theory of learning rooted in psychology and biology. In Piaget’s view, knowledge was not to be construed as preexisting in reality, but only came about by virtue of the individual’s formulations in response to specific observations and experiences. Herein lies the problem of symbolism, which runs like a common thread through Piaget’s studies of the stages of cognitive development of the individual, from the child’s earliest manipulation of signs to the mature adult’s formation of abstract symbolic reasoning. Piaget also explored the areas beyond his specializations, both in the humanities and the hard sciences.

Piaget, like Vico, considered the concepts of science an invention, a fabrication of man; on this basis he identified epistemological errors within psychology and biology even as he developed a learning theory that had broad applications within the larger academic community. Focusing on the qualitative nature of knowledge, Piaget rejects behaviorism and other quantitative sciences that fail to take into account the nature of evolution, both in terms of ontogenesis and phylogensis. His constructivism abandons the notion of the passive observer and encourages learners to pose and test new hypotheses in response to
new situations. He also questions the established modes of working in the teaching profession insofar as knowledge can not be seen as existing apart from the learner (as a copy or imitation of reality), but is arrived at anew in each situation; thus the principles of adaptation, accommodation and reflection replace the notion of given truths. As long as educators retained a Cartesian model of clarity based on the absolutes, complex thought would be excluded from the classroom. The expanded areas of psychological research are impacted by the changed understanding of consciousness as a stratified and highly varied matter, more nuanced in terms of learning than previously believed: ‘psychology attempts to explain why the development of intelligence ends, in its necessary form of equilibrium, in the setting up of composable and reversible systems of operations’ (Piaget, 1972, p. 81).

Genetic epistemology concerns the sociogenesis of knowledge, thus the development of knowledge over time, according to operative processes rooted in the common sense (here too is a link with Vico). The operations lie at the basis of Piaget’s pedagogy, which can be described as processual, actionist, integrative and constructivist.

[First,] an operation is an action that can be internalized; that is, it can be carried out in thought as well as executed materially. Second, it is a reversible action; that is, it can take place in one direction or in the opposite direction .... The third characteristic of an operation is that it always supposes some conservation, some invariant. It is of course a transformation, since it is an action, but it is a transformation that does not transform everything at once, or else there would be no possibility of reversibility .... The fourth characteristic is that no operation exists alone. Every operation is related to a system of operations, or to a total structure as we call it. (Piaget, 1970, pp. 21–22)

Piaget’s essays on pedagogy are few, but they tie in to his thinking on the subject of education in a way that is opportune for our presentation in the next section of the notion of heterarchy as an integrative practice in today’s university. By recommending a pedagogy that is actionist and integrative of the disciplines, Piaget expresses discontent over the intuitive method, which is ‘receptive’ and ‘static’, as well as the authority-based method, which does not broach the subjectivity of the individual learner. In contrast to these methods the active constructivist methods are difficult to employ:

The heartbreaking difficulty in pedagogy, as indeed in medicine and in many other branches of knowledge that partake at the same time of art and science, is in fact, that the best methods are also the most difficult ones: it would be impossible to employ a Socratic method without having first acquired some of Socrates’ qualities, the first of which would have to be a certain respect for intelligence in the process of development. (Piaget, 1977, p. 712)

The reason constructivist methods are difficult might be summed up by stating that they seek access to an ‘internal epistemology’ (Piaget, 1972, p. 95). This epistemology is always in process; it cannot simply be the study of the state of knowledge today, but must concern knowledge’s ongoing development and transformation: ‘scientific thought ... is a process of continual construction and reorganization’ (Piaget, 1970, p. 2).
Once the facts of knowledge are identified, one can perceive the parallelism between the formation of knowledge and its meaning: ‘The fundamental hypothesis of genetic epistemology is that there is a parallelism between the progress made in the logical and rational organization of knowledge and the corresponding formative psychological processes’ (Piaget, 1970, p. 13). Piaget (1977) disagrees with the idea that by learning a ‘dead language’ one can somehow acquire skills that will be useful to one and ‘be transferred to other activities’: ‘Supporters of this hypothesis ... will even go so far as to imply an absolute contrast between this subtle or analytic type of mind (esprit de finesse) and the geometrical type of mind (esprit de géométrie), as though the latter were exclusive to the sciences and the former to the literary disciplines, whereas both, of course, are found everywhere ...’ (p. 709).

Piaget studied the methodological and curricular changes underway in the lower schools and the universities, on either side of the Atlantic. He was dismayed over the large class sizes and the proliferation of unproven methods, in particular the mechanized (‘programmatic’) methods and the ‘current receptive methods’ which were ‘intuitive’ in character (1977, p. 712). The problem with these methods—aside from the fact that their effectiveness had not been demonstrated—was their failure to constitute a genuine pedagogical approach to operations. Piaget regrets the confusion in contemporary pedagogical debates that associates the static and ‘intuitive’ methods with the active methods he himself supports. It is a sign of Piaget’s dedication to process, his focus on actions and operations and his conviction that the body of knowledge in a field and the history of that knowledge’s development are ultimately inseparable, that he is not tied to any specific pedagogic doctrine.

Lamenting the divide between academic departments in the sciences and the humanities, Piaget (1977) writes: ‘It would be impossible to exaggerate the harm done by such compartmentalizations, the most evident result of which is the constitution of a sort of a social caste of philosophers, who are called upon to deal directly with the total sum of reality without any personal initiation into what is meant by controlled scientific research’ (p. 708). Piaget conceived of the system of the sciences as a cyclic order and not as a linear sequence. As he assesses the changes in this regard during the period 1935–1965, he notes that formerly the scientific community had adhered to a linear sequence but gradually came to adopt the cyclic and integrable relation charted here (Piaget, 1970, p. 83):

![Diagram](image)

About the symmetries and complementarities represented here, Piaget (1970) advises as follows: ‘The circle of the sciences ultimately demonstrates what the analysis of each
particular form of knowledge directly emphasizes, but in varying degrees, namely the close interdependence between subject and object’ (p. 84). He envisions a future day when the languages of the sister disciplines will be mutually understandable (and not simply those in this chart); but he is also cautious about unexamined assumptions that substantive relations will necessarily be forged across the sometimes great distances separating the human, social and hard sciences. Since he suggests that ‘the development and the epistemological aspect of all science are essential manifestations of man’s activity’ (Piaget, 1970, p. 103), it is in this area of researching the mechanisms and operations of knowledge (as notably by recent cybernetic research) that he envisions the most fruitful terrain for future development of interdisciplinary discourse.8

Proposing an Academic Heterarchy

For the constructivist one of the most valuable things a student can learn is the idea of possibility. Thus, for example, in the science classroom the educator would seek to convey von Humboldt’s idea of ‘science as something that has not yet been and never will be completely discovered’ (Habermas, 1989, p. 109).9 This is another area where Vico’s example remains important, as he vindicated the probabilistic reason and the importance of the sensus communis in binding together a cohesive community. Vico reminds us of the complex nature of objectivity as it is formed in the individual subject, a process that begins in childhood and progresses according to certain natural stages and across the broadly integrable fields of practical and theoretical knowledge. In addition, by advocating institutional reform based on the goal of a common intellectual language, Vico was outlining the roles of the university citizen, based on the classic form of liberalism he derived from Seneca, among others.

As Martha Nussbaum notes, it was Seneca who conceived of citizenship as being based on a freedom that does not derive from social class, but from intellectual autonomy and respect. The Senecan liberality depends on the awareness of one’s smallness in the larger scheme of things, of the immensity of one’s unknowing. As such it fosters humility and respect for the differences of others.10 Teachers who employ Socratic method in stating curricular goals and institutional exigencies encourage a class-blind cosmopolitanism, challenging students to represent their positions and their histories. Nussbaum, whose analysis is based on her experiences of teaching in a variety of institutions and disciplines, recalls the Stoics’ opposition to the classical Roman hierarchies that wished to preserve the academy for ‘gentlemanly’ (class-determined) education. Today’s stoics would oppose the idea of a fixed canon of prescribed texts or the quantification of what constitutes cultural literacy or the fashion of identity politics: ‘An especially damaging consequence of identity politics in the literary academy is the belief, which one encounters in both students and scholars, that only a member of a particular oppressed group can write well about that group’s experience’ (Nussbaum, 1997, p. 111).

The particular hierarchies endorsed by constructivist educators are heterarchies, or ‘systemic networks in which the dominant locuses of constraint and control immanent in the system may change place and function—and their relative logical typing—in the overall structure through time’ (Wilden, 1979, p. 25).11 Heterarchy, or ‘the rule of one’s neighbor’, is a social and symbolic system based on the recognition of the other; it
emphasizes the recursive and self-corrective nature of thought. When applied to teaching, heterarchies engage both qualitative and quantitative means of inference and reasoning; they seek out protocols that connect the internal values of one’s discipline to those of other disciplines. The constructivist educator is drawn naturally to such a model as it favors the ability to self-calibrate and discerns between levels of discourse and supports ‘a double knowledge, in which traditional knowledge and a recognition of the ecology of mind are mutually compared and integrated’ (Dal Lago, 1992, p. 163).

Constructivists situate aesthetics and ethics at the center of a dialogue whose purpose is to reframe knowledge and coordinate meanings derived from a plurality of contexts. In this way they adopt the self-reflectiveness of historical humanism: ‘The Humanist believes in the power of the human mind of investigating the human mind’ (Spitzer, 1967, p. 24). This tenet is equally important in the physical sciences, the life sciences, the social sciences, the arts and the humanities. If one is studying Newton, for example, one will learn of the importance of guesswork, hypothesis-making and observation in conducting of empirical research. One will learn how Newton was criticized for the new categories of learning he proposed. If one is studying Vico one might be reminded that he was led to organize his New Science into axioms (degnità) in imitation of the systematic use of axioms in Newton’s Principia Mathematica. In other words, the empirical and quantitative restraints of a specialization like mathematics need not limit the moral ideas of the specialist. When Cassirer wrote, ‘Mathematical laws are the means for knowing dead forms; the means for understanding living forms is analogy. Analogy unveils history’s language of forms’ (1996, p. 109), he was not suggesting that we deny the importance of mathematical laws. Rather he was urging that scientists engage in a ‘double judgment’ in order to preserve the integrity of their moral ideas.

Conclusion

As cognitive psychologist and philosopher of education Jerome Bruner has written, ‘The very essence of being human lies in the use of symbols (1966, p. 88). By assembling symbols into social systems and narratives, humans structure their world and ‘give expression to the group’s basic tenets on astronomy, theology, sociology, law, education, even aesthetics’ (Bruner, 1966, p. 89). The university, being the principal sanctioner of knowledge in the society, is the symbol-making body par excellence. Yet if one looks at the professional literature on the institution, little is stated about symbol. According to Kenneth Burke, symbolic discussions are averted within bureaucratic structures because such discussions follow their own internal motivational structures rather than those of a legalistic hierarchy: ‘A study of symbolism is annoying, we must admit, because it requires us continually to be “off the subject” ’ (Burke, 1984, p. 191). Certainly if one is interested in exploring the unstated assumptions of educators and the implicit relationships that underlie the official discourse of the institution, a study of symbolism is called for.

Gregory Bateson had the constructivist approach in mind when, as a Regent of the University of California, he advocated the practice of ‘paradigmatic conservativism’ in the University’s practices. Warning against the rapid assimilation by the academy of the ecocidal practices and epistemological errors of the outside world, Bateson criticized the
University’s quantitative focus: ‘This enormous emphasis upon the quantitative view and the minimal emphasis on the patterned view is, I believe, the easiest way of descent into hell’ (1981, p. 351). Against this direction Bateson advocated for the conservation of an integrated qualitative/quantitative, value-rich, ethical system: ‘The total system is a sort of ladder, interlocking settings which are calibrations, which are qualitative, discontinuous, fixed, structural sort of things. And events which are usually quantitative. The tendency of our thinking today, is to think almost entirely on the quantitative side of the picture, and to argue about quantities’ (1981, p. 353). Such a tendency is leading to unpredictable, perhaps disastrous and global pattern changes; to oppose it in the name of paradigmatic conservatism is to reconnect to an ecological, systems-oriented sensibility that respects eternal verities and the equilibrium of cultural and biological systems. By positing heterarchies, one can situate the individual within dialogical and metalogical structures. According to Bateson (1991), the great oversight of Western humanity lies in its ignorance and avoidance of natural history, and its tacit acceptance of a flawed epistemology originating in the mind/body split:

First, it is now clear that the medieval view of mind/body relations as a sort of demonic possession is obsolete. Second, although the realm of ideas, information, mind—call it what you will—is immanent in, and inseparable from, the realm of physical appearances, it must be approached with its own special preconceptions and premises ... . The new science will form around profoundly nonphysical ideas: the nature of the relation between name and that which is named, the nature of recursive systems, and the nature of difference. (p. 157)

The key concepts that anticipate the ‘new science’ Bateson speaks of, are the ‘ratio’ named by Gustav Theodor Fechner in the 19th century as the basis of the percept—or the difference that triggers perception—and the concept of ‘logical types’ formulated by Whitehead and Russell in Principia Mathematica (1927). This recognition of difference is critical in so far as it presupposes and practices a pedagogy based, as Vico would say, on what human beings themselves have made.

Bateson’s call for prudence is a recognition of a societal incapacity to coherently embrace the magnitude of natural and cultural forces in flux due to an addiction to physical metaphors of power and force. In contrast, paradigmatic conservatism entails symbolic thinking that envisions the future of natural organisms and living systems in terms of heterarchy and not under the control of a single entity. To imagine heterarchy is to pursue in concrete terms the true meaning of education: to educe, to draw out what is potentially there. When learning is construed as a process of accumulation instead of a drawing out, information is overvalued at the expense of knowledge, and knowledge is mistaken for wisdom. Such a manner of thinking presumes disinterestedness but does so by eschewing symbolism; a trivial certainty is preferred over the non-trivial unknown.

As Edgar Morin (2001) writes: ‘Because we were taught to separate, compartmentalize and isolate learning instead of making connections, the whole of our knowledge forms an unintelligible puzzle. Interactions, retroactions, contexts and complexities, lost in the no-man’s land between different disciplines, become invisible’ (pp. 34–5). If the academic institution is to reconnect to itself and to society, it will make these connections
visible, in the symbolic explanations of its role in the advance of knowledge in the society. As Morin (2001) writes, ‘To understand means to intellectually apprehend together, *comprehendere*, to grasp together (the text and its context, the parts and the whole, the multiple and the single). Intellectual comprehension operates through intelligibility and explanation’ (p. 78). Here one sees fulfilled the pedagogic mission of Vico and the moral investment of the sciences foreseen by Cassirer and the integration of objective and subjective knowledge by Piaget. While symbolic thinking is not always welcome within an institutional structure that prides itself on rationalism and logic, it remains an essential part of academic discourse.

**Notes**

1. Edward Said (2000, pp. 89–92) notes the contradictions involved in Vico’s forcing the details of language, such as etymology and derivation, back into the physical world, even as he was forcing them into the divine, providential sphere.

2. As Nicholas Rescher puts it (1996, p. 111), ‘The fundamentality of psychic process for the constitution of a self was put on the agenda of modern philosophy by Descartes, although unfortunately, he took too substance-oriented a view of a person—as his use of *res* (thing) indicates.’

3. See Herrick, 2005, p. 176: ‘In works such as *On the Study Methods of Our Time* (1708), Vico argued that the mathematical proofs of Descartes were just as reliant on symbols as were the orations of the rhetoricians.’

4. See R. A. Hall (1941) for a review of Vico’s linguistic theories that exposes a variety of inaccuracies and internal contradictions within them.

5. Writing of Vico’s philosophy of history and its importance for the formation of the modern ‘philosophy of culture’ and ‘philosophy of spirit,’ Cassirer writes (1996, p. 104): ‘No matter how highly we may value the historical achievement of this basic organological view, this cannot distract us from its fundamental, systematic limit. This limit lies in the fact that it too attempts to solve problems concerning pure “meaning” by relegating them to the level of occurrences and so transforms them into problems concerning actual events.’

6. Entropy is understood by Bateson (1980, p. 250), as ‘the degree to which relations between the components of any aggregate are mixed up, unsorted, undifferentiated, unpredictable, and random. The opposite is negentropy, the degree of ordering or sorting or predictability in an aggregate.’

7. One could say that Keller’s ‘seeing blindness’ stands as a symbol for deutero-learning, the term coined by Bateson (1972) who defined it as the ‘progressive change in rate of proto-learning’ (p. 167).

8. See Piaget, 1972, p. 95: ‘[T]he most promising interdisciplinary developments are undoubt-edly those which can be grouped under the name of cybernetic studies. Cybernetics is itself already interdisciplinary in nature in that it attempts, among other things, to provide a theory and a practical realization of machines which are at the same time programmed and auto-regulating, as are living beings. In addition, it achieves this through using models relating to general algebra, logic, information theory, and game or decision theory. Cybernetics is therefore currently the most polyvalent meeting-point for the physico-mathematical, the biological and the human sciences.’


10. See Nussbaum, 1997, p. 295: ‘We do not fully respect the humanity of our fellow citizens—or cultivate our own—if we do not wish to learn about them, to understand their history, to appreciate the differences between their lives and ours. We must therefore construct a liberal education that is not only Socratic, emphasizing critical thought and respectful argument, but also pluralistic, imparting an understanding of the histories and contributions of groups with
whom we interact, both within our nation and in the increasingly international sphere of business and politics. If we cannot teach our students everything they will need to know to be good citizens, we may at least teach them what they do not know and how they may inquire. [...] Above all, we can teach them how to argue, rigorously and critically, so that they can call their minds their own.'

11. In tracing the precedents for such a perspective, Wilden refers back to Nicholas of Cusa and his concept of God as the ‘ultimate constraint,’ ‘the constraint we now call entropy’ (1979, p. 13).

12. See Segal, 1986, p. 135: ‘In a heterarchy you rule within a circle ... McCulloch used the term *heterarchy* to distinguish context-determined value choices from the more familiar notion of a *hierarchy*. Heterarchical values, expressed in behavior, are relative choices, dependent on time and context.’

13. Already in the 1960s, the influence of positivism on the humanities caused Leo Spitzer (1967) to warn against the reductionisms of ‘so-called humanists who persist in imitating an obsolete approach to the natural sciences, which have themselves evolved toward the humanities’ (p. 1).

14. In response to the accusations of Newton’s adversaries that he was merely weaving hypotheses, Whitehead sums it up nicely: ‘Newton *was* weaving hypotheses’ (1929b, p. 52). The novel use of symbols had a fundamental importance in the discoveries of Galileo and other revolutionary scientists. As Latour (1986) argues, scholars are prone to overlook the use of the imagination by mathematicians, a factor that is sometimes dismissed or not accorded its centrality to the scientific endeavor.

15. See Whitehead, 1968, p. 171: ‘the word “education” means literally, the process of leading out. Thus we are talking of the way in which all your faculties and capacities should be encouraged to expand and unfold themselves. Consider how nature generally sets to work to educate the living organisms which teem on this earth. You cannot begin to understand nature’s method unless you grasp the fact that the essential spring of all growth is within you ... . What is really essential in your development you must do for yourselves. The regular method of nature is a happy process of genial encouragement.’

16. See Whitehead, 1929a, p. 46: ‘Though knowledge is one chief aim of intellectual education, there is another ingredient, vaguer but greater, and more dominating in its importance. The ancients called it “wisdom”. You cannot be wise without some basis of knowledge; but you may easily acquire knowledge and remain bare of wisdom.’

17. Edgar Morin (2001) concludes this particular section by saying ‘Understanding, always intersubjective, demands an open heart, sympathy, generosity’ (p. 78).

References


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