*As an essay to share with the participants of the “Teaching the Methods of Geoscience” I have chosen “The Child as History.” The essay is based upon lectures from a course I taught to prospective science teachers for several years, “Curriculum & Inquiry,” a course anchored in the philosophy of John Dewey and the writings of Joseph Schwab (perhaps “the father” of modern inquiry-style science teaching). The geoscience community may find the influence of evolutionary and paleontological thinking on educational theorizing to be both interesting and surprising. “Cultural Epochs” in effect are analogs to geologic time periods punctuated by progress in the fossil record. This theoretical construct of pedagogy leads directly to Dewey and Piaget, whose influences remain consequential. These 3 pages are an excerpt from a longer essay which I would be more than happy to share upon request.*

**The Child as History: Recapitulation Goes to School**

Ernst von Haeckel’s recapitulationist metaphor—that idea that stages in the development of an individual mirror its evolutionary past—has anchored theories across many fields. Education is no exception. At the end of the nineteenth century and during the dawn of the twentieth, the influential American educator G. Stanley Hall’s approach to child development assumed recapitulation. For example, he interpreted childhood fears as descended from “the problems of ancestral adults, not the environments of modern children.” (Gould, 1977, p. 140) Whether learning to walk, experiencing fear, progressing in play, or becoming socially adept, children progressed through stages that mirrored the history not only of their biological species (from motions evocative of swimming fish, through crawling cat-like, to upright posture) but also of their race, from savage to civilized, and nation, from classical to modern.

For Hall, schooling needed to match the child’s recapitulation journey and refrain from suppressing expressions essential to completing proper development at each stage. Hence, even savagery ought to be accommodated through opportunities afforded by the natural world—hunting, for example. If not, arrested development would presumably cause problems later in adulthood.

By trusting the instincts of the young child at play in the natural world as a form of early education, Hall mirrored Jean-Jacques Rousseau’s principles. In effect, Hall and his followers provided the eighteenth century Enlightenment philosophy of Rousseau with a nineteenth century scientific foundation. The root metaphor making this elaboration appear both sensible and compelling was “nature.” Rousseau’s writings extolled the natural and vilified corrupting influences imposed upon young minds. He advised in reference to the early education of Emile, “Leave nature to act for a long time before you get involved with acting in its place, lest you impede its operations” (Rousseau [1762] 1979, 107). Hall found in biology a rationale for the idealistic trust in nature articulated by Rousseau. There was, it seemed, a basis in scientific truth for Rousseau’s rhetoric. Hall fashioned himself as “The Darwin of the mind” (Hall, 1923, 360; cited in Kliebard 1986, 35).

 Though unable to fully organize schooling in a fashion that might delight Huck Finn (including a stage of freedom intended to promote the development of the noble savage), near the end of the nineteenth century leading educators did try to organize curriculum for children as a progression through the epochs of past cultures. They reasoned, “If all the world is in upward flux along a single path of development, then instruction must follow nature as a child mounts through the stages of lower creatures and primitive civilizations towards a higher humanity” (Gould 1977, 148).

 As described by Gould, leading American educators made pilgrimages to German universities during the 1870s and 1880s to learn the theory of culture-epochs, Kulturhistorischenstufen. Upon their return, they disseminated these views as anchors to an emerging progressive philosophy in American schools. Soon afterward there emerged the Child Study movement, which faulted schools for excessive drill, rote learning, and curriculum poorly matched to the developing needs of children.

The child-centered, Herbartian prelude and postlude to culture-epochs theory

American educators also learned in Germany the educational philosophy of Johann Friedrich Herbart (b. 1776; d. 1841) and in 1892 formed, in opposition to the traditional curriculum of classical humanism, the National Herbart Society. Its members thought of themselves “as scientific in outlook” (Kliebard 1986, 18). Well into the twentieth century Herbart received credit for his “pedagogics . . . still the source of much of our best educational theory and practice” (De Garmo 1953, 115). The National Herbart Society lived for not much more than a decade, but it galvanized reformers such as Hall and brought John Dewey into the educational fold. The National Herbart Society was Dewey’s cradle.

 Herbart criticized Hegel’s approach to resolving contradiction through synthesis. For Hegel, synthesis meant establishment of a level of thought superordinate to the contradictory notions (thesis and antithesis). De Garmo cited the prime example of Hegel’s method: there can be “being” and “non-being,” its opposite. The higher level synthesis brings these two opposites together. In this case, the synthesis is “becoming” which implies movement from non-being to being.

 Herbart, according to De Garmo, taught the acceptance of the contradiction of opposites and instead of resolving such tension through synthesis at a higher level advised his followers to “honestly endeavor to remove the contradictions inherent in our everyday thought of the world” (De Garmo 1953, 115). In order to remove contradictions, Herbart would accept “any presupposition, rational or irrational, which promises to resolve the difficulty, even though the principle of explanation should forever resist demonstration as to its reality” (De Garmo 1953 115).

 There is no clearer expression of this approach in the present than the “principle of charity” introduced to the science education literature by Klaassen and Lijnse (1996). Klaassen and Lijnse analyzed a classroom dialogue in which a student resisted the teacher’s explanation of force. The teacher used the term “force” consistent with Newtonian laws of motion. The student, however, rejected the statement that a table exerted a force on a resting object. The exasperated teacher was unable to convince the student that she held a misconception and to replace it with the Newtonian concept.

 Klaassen and Lijnse analyzed the teacher-student quarrel and concluded that the participants did not, in fact, differ in belief or opinion “about how things are in the world” (129). They quarreled because they were “not aware that they do not assign the same *meaning* to the expression ‘to exert of [sic] force’” (129). Klaassen and Lijnse endeavored to determine the student’s meaning of “force” from her use of the term. They summarized their method as follows:

Assign such meanings to a speaker’s expressions that she comes out as consistent and a believer of truths. (Klaassen and Lijnse 1996, 129)

 Klaassen and Lijnse attributed their principle of charity to the influence of Davidson’s philosophical work (1984). Its antecedents, however, are clearly in the Herbartian agenda to remove contradictions in everyday thought about the world by accepting a presupposition that removes the contradiction. What Klaassen and Lijnse, after Davidson, have done is to apply this principle to the problem of communication about the everyday world. In so doing, they have arrived at a conclusion that is very respectful of student intelligence. In addition, they have responded to Rousseau’s admonition not to ascribe adult meaning to children’s words:

They have another meaning than ours without being able to perceive it; so that, appearing to answer us quite exactly, they speak to us without understanding us and without our understanding them. It is ordinarily due to such equivocations that we are sometimes surprised by their remarks. (Rousseau, 1762/1979, p. 73)

 Modern educators would refer to children’s surprising equivocations as “misconceptions.” The principle of charity, however, makes a less summary judgment. Of salience is the attention to meaning from the perspective of the child and the attempt to align the curriculum in order to capitalize on natural interests. At the same time there is an implicit need to make curriculum respond to and encourage the natural development of the child.

 Child-centered, Herbartian reformers endorsed culture-epochs theory because “a curriculum organized in this way had a guaranteed appeal to children’s interests. Children, they felt, had a natural affinity for materials drawn from a historical epoch which corresponded to their stage of individual development” (Kliebard 1986, 46). The development of thought flourished best, believed the Herbartians, in the context of children pursuing their natural interests. Culture-epochs theory, in effect, attempted to rest the task of authoring school curricula on a firm, scientific foundation, one that would validate the romantic appeal of promoting children’s natural interests.

 The Herbartians also emphasized the principle of “apperception.” Apperception is “the mental assimilation that takes place when we use knowledge already acquired to interpret new knowledge” (De Garmo 1953, 116). This principle figures prominently in Ausubel’s psychology and theory of meaningful verbal learning. Ausubel is frequently quoted as saying, “The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly” (Ausubel 1968, vi; cited in Novak 1977, 24). Ausubelian learning theory led to the practice of “concept mapping” as a tool for representing the network of concepts comprising a student’s prior knowledge.

 Finally, and most importantly, Herbartians stressed “direct interest” and the derivation of interest from experience. Interest stemmed from empirical, causal, and aesthetic aspects of the subject and from sympathetic and social dimensions of interaction with others. For the Herbartians, interest had both subject and social components. At the pinnacle of Herbartian method stands “the well-ordered activity of the pupil in the solution of problems and tasks” (De Garmo 1953, 117). These are problems and tasks of direct interest to the pupil; culture-epochs theory suggested what they should be. However, Herbartian philosophy predated culture-epochs theory and as modified by John Dewey extended far beyond it. Herbartian philosophy has promoted social interaction, experiential learning, interest-centered curriculum, and subject integration.

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