

TOWARD INTERDISCIPLINARITY:  
APPROACHES TO THE DISCIPLINES FROM THE 1890s

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With the increasing interest in interdisciplinary and integrated curriculum, techniques for assisting teachers and curriculum directors in approaching what is generally regarded as a new innovation have begun to proliferate. On the whole, these approaches appear to be largely techniques, but neither this aspect nor the notion of interdisciplinary teaching is new. The purpose of this paper is to explore some of the theoretical work in interdisciplinary curriculum which was done a century ago and to stimulate thinking about interdisciplinary curriculum which moves beyond the purely technical.

Until the second half of the 19th century, the dominant view of the academic subjects had been as a means toward disciplining the various faculties of the mind. Curriculum content was to be based upon a combination of disciplines which would ensure the harmonious development of the total mind, but the subjects were to be taught separately in order to best train each of the separate faculties. In the last decades of the century, several new approaches to curriculum appeared, in part to deal with the proliferation of new subjects of study, in part as an antidote to heavily criticized rote teaching through which many students seemed incapable of substantive learning.

The first systematic attempt to relate those parts into a coherent whole appears to have been that of William Torrey Harris, developed during his tenure in the St. Louis Public Schools in the 1860s and 1870s. The basics of elementary education he considered to be reading and writing, arithmetic, geography, history, and grammar. Reading was the key study, through which one "issues forth from the circumscribed life of the senses," and which "emancipates the pupil from the thralldom of dependence on the spoken word," offering him "all that has been observed and comprehended in the world, and...all the wisdom that has been derived from human error and suffering." In an 1869 article, he placed reading and literature at the center, from which the other branches were to branch out, but by 1888 Harris had formulated the "five windows of the soul" metaphor for which he would become known. The unity of the Hegelian world-view served as his context, history being the account of the institutions man creates as a manifestation of the "essential and eternal in the human will," and of "how men have attacked and defended their substantial will as embodied in those institutions." History was one of the five windows in the five-sided "dark tower of ignorance" of illiterate man, the others being arithmetic,

geography, grammar, and literature. Arithmetic opened the window of the soul toward the inorganic phase of nature, geography toward the organic phase and its relations, "first to the inorganic nature which it presupposes, and secondly, to the triple world of man above it, for whom it offers its service." That triple world consisted of human will, intellect, and sensibility, viewed through history, grammar, and literature respectively. The purpose of education was to "fit individuals for...interchange of all with all," that each might be "brought on the way toward comprehending the experience of his fellow-men, and...rendered capable of lifting himself into a helpful relationship toward all."

The key to the intellect for Harris was grammar, which revealed "the logical constitution of the mind." It was the introduction to psychology and all philosophy, training the mind "to see its own processes, to make careful discriminations, to define logically, to lay out work and arrange for division of labor," and, above all, cultivating directive power in the soul." Grammar also led to philology and connected as well with that language study which consisted of the "acquisition of higher vocabularies," i.e. the special vocabularies used in literature and the other disciplines. In the focus on logic, grammar joined with history to create the social and political sciences in Harris' 1869 formulation, then out of their intersection with physical geography came the first principles of political economy. In 1888 he merely pointed to jurisprudence, sociology, politics, political economy, archaeology, and ethnology as emanating from history. Geography, which he had conceived in 1869 as providing the techniques for natural history through physical geography, was in 1888 more specifically the door to meteorology, astronomy, geology, botany, and zoology, the disciplinary descendants of natural history. Arithmetic developed into geometry and algebra, "natural philosophy," and chemistry. Natural philosophy appeared in both the 1869 and 1888 versions, but in 1869 Harris noted that it provided the techniques of the "quantitative or mathematical sciences of nature" whereas natural history, emanating from physical geography, provided the techniques for the "qualitative branches of Natural Science." Thus the natural sciences appear at the intersection of mathematics and geography, as the social and political sciences appear at the intersection of grammar and history. Out of the political and social sciences in combination with physical geography comes

political geography. Finally, literature represents the "unity of intellect and will," embodying "the transitions of the soul from mere life or unconscious habit to conscious thinking and willing," the "essential in human character," and leads eventually to the "oracles of religion." Harris' goal was to place the curriculum within a greater system, much as his German Hegelian counterpart, Rosenkranz, had done in his works on pedagogy and the philosophy of education."

A similar attempt was made by William DeWitt Hyde, president of Bowdoin College, in 1892, as a way of demonstrating that the new "social ideal" of education, which had emerged and encompassed its predecessors, the ecclesiastical, and industrial ideals, was in fact embodied and expressed in the American educational system." His schema laid out seven concentric circles representing the seven stages of education from nursery through the university, then cut through them with eight radii, which divided the circles into the eight departments of language, literature, mathematics, science, physical culture, art, history, and philosophy. Each of these was traced from its manifestation at the primary level up through the various levels, then was divided into its practical profession and theoretical pursuit at the university level. Hyde's main purpose, which was a vindication of the threatened American college, does not concern us here, but his observation that the diagram demonstrates that knowledge does not proceed from the particular to the general but the reverse is of some interest. Drawing on William James, he points out that from the child's perspective, everything is "'one great, blooming, buzzing confusion,'" and that it is only with time and maturity that the large generalizations of self and world are particularized, those growing bodies of particulars eventually emerging as the different disciplines. In a child's earlier years, however, the names of the disciplines are unknown. As one rises through the educational levels, more time is taken to study less, which is to say that smaller and smaller subdivisions are studied in greater and greater detail.

This change to the child's perspective also characterized the work of Francis W. Parker, who had been speaking since the late 1870s about the need to give priority to the minds of children in establishing curriculum. Parker's ideas, which had drawn on early Herbartian work in Germany, laid the groundwork for acceptance of curricula of both the American Herbartians and John Dewey. Parker's *Notes of Talks on Teaching*, published in 1883, contained hints of his theory of concentration, which appeared as such in 1894, again as a series of talks delivered to teachers." Parker's departure point was that "the child's spontaneous study and persistent interest include all the central subjects of study," pursued unconsciously and instinctively, arising out of the "depths of being." This tendency

Parker took to reflect "the unity of human being in design," which was one of the three hypotheses he presented as a basis for the unification of subjects. The other two were "the unity of the Creator and His creations; and third, that the approximating unity of the human being to his Creator is the sublime destiny of man." Since "all true study is the study of the creator through the manifestation of His thought, in the universe and man," the central subjects were those which most directly studied creation or the natural world."

Parker began with geography, or knowledge of the earth's surface, as the most immediately obvious to a child and liable to generate a search for causes, which would lead to geology as the history of that surface and mineralogy in seeking to explore the nature of geological change. These three Parker felt were so intertwined that they "cannot be severed in thought, except by unscientific teaching," and they were best studied through the phenomena of the child's immediate surroundings rather than accounts of exotic phenomena like volcanoes. Meteorology, or the "science of heat" which explained how changes occurred, was the fourth central study; behind all four lay physics and chemistry as explanatory subjects dealing with the laws of motion and change. The intimate link of all these with botany Parker illustrated by asking, "How can one plant be observed without first learning its structural environment, its relations to climate, to air, to water, and to heat? Pull it up by its roots, and the questions of mineralogy meet the eye... That knowledge of a plant which does not include its physical basis, support, nourishment, and function, is of little use." That dependence was clear from the geological records revealed through paleontology. Animals and man, being dependent upon an even wider array of factors, must also be studied within the context of the central subjects. Zoology, or the zoological study of man pursued in anthropology, required understanding the history of human environments as well as the history of human relations pursued in ethnology and then, in its later written records, in what is called history proper. Here geographical understanding reemerges as an important means to turning historical facts into vividly imagined events in their particular geographical setting.

The studies are, as Parker says repeatedly, essentially one study because of the interdependence in function of the subjects to which they are devoted. To teach them in isolation was indeed "analysis gone to seed." They are also bound together epistemologically by the human mind's search for form and number." Because of this, geometry can be studied through the central subjects and the use of imagination." Number, which a child strives for as soon as he begins to try to measure distance to an object, can grow naturally out of the central studies and as the need

for measurement of distance, weight, energy, and time arises." Similarly, the various aspects of language learning will grow out of the child's search for understanding in pursuing the central subjects, just as her pre-school linguistic mastery did." The development of thought is the key. The central studies all move the child toward a study of "immutable, unchangeable law," in Parker's mind of God's laws, upon the search for which he considers "man's growth and development have utterly depended," from the beginning." Put in other terms, "education is the development of the attitude of the being toward truth."

It was clear to Parker that the current curriculum would not be aided by adding subjects to it but that it had to be completely refocused on "quality of mental action" rather than quantity, that is on "the supreme power of the mind to reason and to choose for itself." As he saw it, "the great advantage of the doctrine of concentration is that its application absolutely requires the art of teaching," which he defined as "the ability to guide self-effort in the direction of original inference." Further, "it demands persistent study of all subjects, and practice in all modes of expression on the part of the regular teacher." The argument that specialists can best teach their subject he rejected by stating that "a regular teacher who understands his pupils, and whose sole aim is quality of mental action, will use a subject which he imperfectly knows with far greater effect than a specialist though comparatively master of his subject." A further advantage of concentration as a curriculum principle was that it "demands continual revision of courses of study; revisions comprehending progressive movement in the art of teaching."

The Herbartian pedagogy upon which Parker had drawn for his theory of concentration was the basis for two further interdisciplinary curriculum theories, which reached the public at about the same time in publications by Charles McMurry and Charles DeGarmo. McMurry's *The Elements of General Method Based on the Principles of Herbart* appeared in 1892 and made the moral aim of education the pivot around which the curriculum must revolve. The traditional studies were grouped into three general classes: history, including the subject matter of biography, history, and literature; the natural sciences; and the formal studies of arithmetic, drawing, and language, the last involving reading, writing, spelling, and grammar. Like Parker, McMurry maintained that the formal studies could be more efficiently learned as the means to something in which the student had inherent interest and thus should not be taught as isolated skills." By far the most important study was history, being that from which moral notions were most readily drawn because of the sympathy into which children's feelings can be brought with

stories, literary works, and well-written histories and because of the examples they give of how moral judgments originate." The natural sciences were to be studied for the insight into nature which they give, "with a view to a better appreciation of her objects, forces, and laws, and of their bearing on human life and progress." Building upon the nature study developed at Parker's Cook County Normal School, McMurry emphasized the relationships of the natural sciences as exemplified in the "life history" of a given plant or animal, and he suggested as a mechanism for instruction the development of "type studies," in which those relationships would become evident and from which the student could then transfer his knowledge to other similar objects of study." Understanding was clearly not the only goal, however; "a knowledge of the ordinary means and appliances by which the purposes of life are realized" was also to be contributed by the natural sciences."

The theory of concentration as interpreted by McMurry was, like Parker's theory, centered on the child's mind itself and was justified by the unity of personality toward which every human being is urged by the simplicity of the soul and thus the mental processes themselves." McMurry supported rearrangement of the subject matter of school studies and of lessons so that "the number of close relations between them may be greatly increased" and stipulated that those studies should focus on nature and society, in order that knowledge might clearly refer back to practical life." Like Parker, he gave geography a unifying role, although he did not consider it preeminent."

The tool to actual planning of the curriculum McMurry drew from the culture-epochs theory developed by Herbart's German disciples, in which it was assumed that the child's development parallels the cultural development of the human species and that therefore school materials should progress from more primitive to the more complex. The culture epochs implied a union of history and natural science which was reflected in the child's increasingly sophisticated mental and bodily changes. The sources for this study were to be drawn from the best literature, "as handed down to us by the great literary artists." McMurry diverged from the Judaeo-Germanic sequence proposed by his German models to suggest a uniquely American sequence of four epochs: (1) pioneers, (2) settlements, (3) revolution, and (4) self-government and the strengthening of the federal idea." These he justified by their inherent interest for children and the correlation of lessons and studies which they allowed."

Like McMurry, Charles DeGarmo based the need for some correlation or coordination of studies on the Herbartian rationale that the harmonious unified development of the self required harmoniously coordinated knowledge, and that the interests of the child would be stimu-

lated by interesting relations between topics and studies." This unity of ideas would further build the foundation for new interests, desires, and motives, upon which development of the will depended. Thus the goal of moral character also supported a co-ordination of knowledge into unities rather than fragmented subject areas. With regard to sequence, DeGarmo also followed the theory of the culture epochs. He divided the studies into the humanistic studies of history and literature and the studies of nature which comprise the sciences and mathematics. The humanistic studies were guided by a historical principle, working from more primitive stages of human development toward the present, and they contained the central ethical content. Such a principle was unacceptable for the sciences, however, implying as it did that alchemy and astrology would have to be taught before chemistry and astronomy. The solution was to use geography in connection with history and then to move into the scientific studies through geography. Thus a study of the Alps in a historical context would move into a study of alpine flora and fauna. Geography as a basis for studying commerce would also serve to unite man and nature. The formal or instrumental studies of language and mathematics would be drawn into the humanistic and scientific studies respectively as needed.

Five months after the publication this plan, DeGarmo published a modification which responded to the work of the Committee of Ten." He contended that the individual conferences called for by the committee would clearly each return a report favoring their own subjects, the likelihood of which had justified establishing a study committee of the Department of Superintendence to address the question of correlation as a curriculum principle. Such considerations from the perspective of the logic of the subjects made it imperative, however, that progressive thinkers place greater emphasis upon the psychological order determined by the child's mind.

The pedagogical order of the various parts of a subject of study should be determined, primarily, in view of the pupil's apperceiving capacity, his knowledge, and natural interests, and only secondarily by the logical order of the developed science."

That granted, DeGarmo did not propound the Herbartian reasons for co-ordination as in his earlier article but merely said that the method and extent of correlation would depend upon its purposes, which might be merely preventing unnecessary duplication, seeking to stimulate the child's interests through "the added intellectual pleasure that comes from discovering the causal or curious relationships between phenomena apparently independent," maximizing apperception and thus the pupil's power of

apperception (if one adhered to the theory of apperception), or seeking "to direct and develop the whole moral disposition of the child." The plan which he presented for any of these divided the subjects into three cores, or centers, with geography binding them together. The humanistic core would consist of literature and history, following the plan of the culture epochs, with language study integrated into it. The scientific core would be based on nature study as developed at the elementary level at the Cook County Normal School, in which the obvious objects of the child's interest were used to develop scientific skills of observation and logical thought and to lead into the scientific disciplines at the upper levels. Mathematics would be integrated as the means of expressing quantitative relations. The third core of instruction DeGarmo called the economic core, dealing with the "doubled-sided relation...of nature to man and...of man to nature." It had two corresponding aspects, namely "direct physical training of the child for mastering and utilizing the forces of nature, and...the more contemplative study of the actual manifestations of nature...for the uses of man." The first consisted of manual or industrial training, the second came through literature, "re-enforced by the commercial, social, and political aspects of geography." Where language was the formal side of the humanistic or ethical core, and mathematics of the scientific, mechanical drawing was the formal side of the economic core. DeGarmo also noted that "nature has its literary side" and thus might be the basis for reading, while drawing related to both nature and to the historical and literary studies; music also could be drawn into literary studies through its language content. All three cores would be united by geography, studied not from a political perspective but as determining the conditions and natural forces that determined human history. Those conditions and natural forces included the extent of flora and fauna of a country which gave rise to the sciences, and set the conditions for the economic interaction of man and nature which could be explored through commercial geography. Thus geography was clearly the "universal study," which, "when liberally taught...forms the band that binds the ethical, the scientific, and the economic cores of instruction into a living whole."

We have then, between 1888 and 1895, the appearance of at least five attempts to articulate a relationship among the disciplines, traditional and emerging, which would allow for greater coherence and greater effectiveness in classrooms. The question which these attempts raise is on what basis interdisciplinary work should proceed. William Torrey Harris and the Herbartians clashed over Harris' refusal to consider correlation of disciplines a valid curricular approach even as he chaired a subcommittee of the Dept. of Superintendence to explore its potential as a curriculum

## ENDNOTES

principle. Parker was among his critics in that meeting, as were several of DeGarmo's Herbartian colleagues, and for a short period the culture epochs, concentration, and correlation received widespread public attention. The question remained, however, as to exactly what the underlying unifying principles were to be. Parodies of trivial correlated units were rife, such as the elementary school unit on apples in which every conceivable thing was done to, with, and about apples until one exasperated child drew a horse to eat up all the apples and have done with it.

Modern attempts at interdisciplinarity run similar risks. Thematic units are often formed on superficial topics, with little apparent concern for content or underlying disciplinary structure. On the other hand, some approaches work from the disciplines toward various kinds of relationships, some of which can also be quite superficial. What is perhaps of interest as a general note is that contemporary approaches concentrate largely on the techniques of relating the disciplines or of crossing disciplines lines rather than on the relationships among bodies of knowledge themselves. What the efforts of a century ago suggest is that disciplinary relationships might be explored in more profound ways, in the context of an attempt to understand human knowledge as a unity, which relates as well to the individual human search for unity, harmony and meaning. If nothing else, the added dimension of inquiry into curriculum knowledge would undoubtedly heighten our understanding of ourselves.

1. Among others, see Robin Fogarty, *The Mindful School: How to Integrate the Curricula*. Palatine, IL: Skylight Publishing, Inc., 1991; and Heidi Hayes Jacobs, *Interdisciplinary Curriculum: Design and Implementation*. Alexandria, VA: Association for Supervision and Curriculum Development, 1989.
2. William T. Harris, "Elementary School Education," *Journal of Speculative Philosophy* 3:2 (1869): 185.
3. William T. Harris, "What Shall the Public Schools Teach?", *Forum* 4 (Feb. 1888): 575.
4. Harris, "What Shall the Public Schools Teach?", 573-579.
5. *Ibid.*, 575-76.
6. *Ibid.*, 575.
7. *Ibid.*, 574.
8. *Ibid.*, 576.
9. *Ibid.*, 576.
10. Harris, "Elementary Education," 188.
11. *Ibid.*, 189.
12. Harris, "What Shall the Public Schools Teach?", 577.
13. *Ibid.*, 578.
14. Johann Karl Friedrich Rosenkranz, *Pedagogics as a System*. Tr. Anna C. Brackett. St. Louis: R. P. Studley Company, Printers, 1872.; *ibid.*, *The Philosophy of Education*. Tr. Anna C. Brackett. New York: D. Appleton and Company, 1886.
15. William DeWitt Hyde, "The Organization of American Education," *National Education Association Journal of Proceedings and Addresses*, 1892, 217-229.
16. *Ibid.*, 220.
17. Francis W. Parker, *Notes of Talks on Teaching, Given by Francis W. Parker, at the Martha's Vineyard Summer Institute, July 17 to August 19, 1882, Reported by Lelia E. Patridge*. New York: E. L. Kellogg & Co., 1883.
18. Francis W. Parker, *Talks on Pedagogics: An Outline of the Theory of Concentration*. New York and Chicago: E. L. Kellogg & Co., 1894. The talks were originally delivered to the Teachers' Retreat at Chautauqua in

- July 1891, then at the New York Teachers' Training College, the University of Minnesota, and the Cook County Normal Summer School, according to Parker's preface.
19. Ibid., 11, 18.
20. Ibid., 22.
21. Ibid.
22. Ibid., 27.
23. Ibid., 29.
24. Ibid., 29.
25. Ibid., 34-35.
26. Ibid., 48-49.
27. 57-60.
28. Ibid., 140.
29. Ibid., 37.
30. Ibid., 289.
31. Ibid., 294.
32. Ibid., 293.
33. Ibid., 294.
34. Ibid., 300.
35. Ibid., 299-300.
36. Ibid., 301.
37. Charles A. McMurry, *The Elements of General Method Based on the Principles of Herbart*. Bloomington, IL: Public-School Publishing Company, 1892.
38. Ibid., 19.
39. Ibid., 21, 26, 29.
40. Ibid., 41.
41. Ibid., 43.
42. Ibid., 53.
43. Ibid., 88-89.
44. Ibid., 92.
45. Ibid., 96.
46. Ibid., 107.
47. Ibid., 113.
48. Ibid., 118.
49. Ibid., 119-126.
50. Charles DeGarmo, "German Contributions to the Co-Ordination of Studies," *Educational Review* 4 (Dec. 1892): 422-437.
51. Charles DeGarmo, "A Working Basis for the Correlation of Studies," *Educational Review* 5 (May 1893): 451-466.
52. Ibid., 454.
53. Ibid., 455.
54. Ibid., 456.
55. Ibid., 463.
56. Ibid.
57. Ibid.
58. Ibid., 466.