

Roots of Modern Disciplines

By Maury Seldin*

Philosophical Foundations

“That all our knowledge begins with experience there can be no doubt... But although all our knowledge begins with experience, it does not follow that it arises from experience.” [Kant, *Critique of Pure Reason*]

The combination of the opening sentences of the first two paragraphs of Kant’s, *Critique of Pure Reason* is a pivotal point in the development of contemporary disciplines. It is retrospective in indicating the emergence the modern approach to research in that our Western heritage of philosophical roots is built upon the *a priori* reasoning of the ancient Greek philosophers, especially Plato and Aristotle.

The part that did not arise from experience was, in the words of Steven Jay Kline [*Conceptual Foundations for Multidisciplinary Thinking*, p.195] summarized as follows:

“These Greek ideas exalted rational thought, logic, and the life of the mind. For the most part, however, the ancient Greek thinkers did not use empirical evidence; they relied on thought and discussion, not only as the sources for knowledge, but also as the means of verification.”

In the beginning of the Enlightenment era there was a unity of all knowledge outside the theological knowledge that provided the “sacred canopy” [see Peter Berger’s 1969 book referred to on page 194]. Kline identifies this unity of knowledge as a single body in the ensuing paragraph.

“Ancient Greek thought about the physical world had been summarized by Aristotle, and his writing was taken as an authoritative source regarding natural phenomena by many European scholars in the period during and following the Renaissance. The use of Aristotle as a source of “the truth” about the physical world was similar to the way the Scriptures had served during the Middle Ages. This view led to what was called “natural philosophy,” which was taken to include all the scholarly knowledge that lay outside the theological knowledge. For several centuries, natural philosophy was seen as largely a single body of knowledge.

Kant blended the *a priori* with the empirical that turned out to be the foundation for the highest quality of knowledge, empirically verifiable results. The methodology, which is of great rigor, turns out to be the altar at which modern day academics worship.

The social scientists picked it up from the physical scientists, although the laboratory settings were not comparable. But, the methodology was critical to the development of modern day disciplines.

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Emergence of a Discipline

Kline identifies eight steps in the development of a discipline, not necessarily taken in a particular order. [pages 199-200] The first four are as follows: “Selection of a class of systems with an associated set of problems... Observations of the behavior within the class of systems... Organization of the observations into taxonomy... Formation of ‘rules’ that describe the phenomena within the taxonomy either as a whole or for particular subdomains.” The “rules” concept refers to a very broad array of relationships defined with various degrees of rigor. The other four steps refer to the process of refining the rules in order to better represent the system. Depending on the complexity of the system, one may develop a “grand theory” or settle for descriptions of relationships that represent behavior associated with a set of problems.

Generally, there is an empirical grounding “...which most clearly distinguishes modern from ancient study of truth assertions methodologically...” It was in the area of physics that Galileo and Newton provided “... the first instance of successful formulations of rules following the steps all the way from 1 through 4.”

Prevailing Topic Selection

Academia has been enthralled with the rigor. Thus, much of science, including social science, has focused on rigorously “mopping up” details of the discipline. Thomas S. Kuhn, in his seminal work, *Structure of Scientific Revolutions*, writes, “Normal research which is cumulative owes its success to the ability of scientists regularly to select problems that can be solved with conceptual and instrumental techniques close to those already in existence. (That is why an excessive concern with problems, regardless of their relation to existing knowledge and technique, can so easily inhibit scientific development.)” [p.96, Second Edition] The parentheses are his, and the key word is “excessive.”

Earlier in the same book he writes as follows:

"Few people who are not actually practitioners of a mature science realize how much mop-up work of this sort a paradigm leaves to be done or quite how fascinating such work can prove in the execution. And these points need to be understood. Mopping-up operations are what engage most scientists throughout their careers. They constitute what I am here calling normal science. Closely examined, whether historically or in the contemporary laboratory, that enterprise seems an attempt to force nature into the preformed and relatively inflexible box that the paradigm supplies. No part of the aim of normal science is to call forth new sorts of phenomena; **indeed those that will not fit the box are often not seen at all** [emphasis added]. Nor do scientists normally aim to invent new theories, and **they are often intolerant of those invented by others** [emphasis added]. Instead, normal-scientific research is directed to the articulation of those **phenomena and theories that the paradigm already supplies.**" [Kuhn, Thomas S. *The Structure of Scientific Revolutions*, 2nd edition, Chicago, The University of Chicago Press, 1970, p. 24.]

The thrust of modern research being in the box, and the difficulty of going beyond the established paradigm, is indicated in the following quote, again from Kuhn. [p.76]

“Philosophers of science have repeatedly demonstrated that more than one theoretical construction can always be placed upon a given collection of data. History of science

indicates that, particularly in the early development stages of a new paradigm, it is not even very difficult to invent such alternates. But that invention of alternates is just what scientists seldom undertake except in the pre-paradigm stage of their sciences development and at very special occasions during its subsequent evolution. So long as the tools of a paradigm supplies continues to prove capable of **solving the problems it defines** [emphasis added], science moves fastest and penetrates most deeply through confident employment of these tools. The reason is clear. As in manufacture so in science – retooling is an extravagance to be reserved for the occasion that demands it. The significance of crises is the indication they provide that an occasion for retooling has arrived.”

Enhancing the System

The key is in the selection of problems to be defined. Momentum is a great force in research, as in other areas. The tendency is to define problems in the context of existing research, solvable with existing methodology. New disciplines may emerge when there is, in the words of Kline, relevant to identifying the first step in the development of a discipline, a “Selection of a class of systems with an associated set of problems.” It is the selection of problems that needs the attention in order to improve predictive ability relevant to improving quality of life.

The alternative view that the goal of social science should be increasing intelligibility rather than predictive ability is an epistemological issue addressed by Alexander Rosenberg in his *Philosophy of Social Science*. He writes, “If increasing the understanding of human actions improves our predictive powers, then of course there is no conflict.” [p.213.] The philosophy of social science underlying this essay is that what we know and how we know it is important for the purposes of improving the quality of life. The basic research is to develop knowledge where the applicability is not yet evident, but where there is faith that in time it will make a difference.

Making a difference is what it is all about. And the birth of a new discipline is a way to sharpen the focus in studying a set of problems in order to get a better understanding of relationships useful in predicting outcomes. Auguste Comte, a philosopher in the Age of Enlightenment, was a pioneer in launching new disciplines in the social sciences. He believed that “...the future of humanity lay in science and that scientific methods could equally be applied to social studies.” [A *World of Ideas*, by Chris Rohmann, p.72.] Comte wrote about sociology, referring to it in the sense of a broad range of human sciences, as a discipline that should “descend from the other disciplines in a series of hierarchical steps...” [Kline page 208.] In Kline’s words, “The hierarchy that Comte suggested went in descending order: math, astronomy, physics chemistry, biology (including physiology), sociology.” The sociology was conceived as a “master discipline.” It included anthropology and psychology as well as sociology, all of which were borne in the late nineteenth century.

Edward O. Wilson’s hierarchy goes from physics, chemistry, and biology to sociobiology which is the link to the social sciences that he develops in his concept of consilience. Within the social sciences, political sciences goes back to ancient times, but is combined with economics in the discipline of political-economy. Economics develops on its own starting in the eighteenth century.

Economics later develops into sub-specialties such as labor economics and land economics. When land economics later develops as a discipline, the concern with its administration emerges into a discipline. For a long time, business administration was thought of as applied economics. But, it is obviously more. We don't call it applied behavioral sciences or applied mathematics. We integrate those disciplines and come up with a new category called business administration or management. Thus, real estate administration has taken a variety of disciplines and emerged to deal with its set of issues which may include the natural sciences in dealing with the environment, and other social sciences in dealing with the politics and sociological issues. It is interdisciplinary, not simply multi-disciplinary. We will get better predictive ability for the decisions relating to societal issues affecting our quality of life by drawing on the relevant disciplines and attacking the salient problems rather than tackling the problems that simply increase intelligibility. It reminds me of a joke I heard about sixty years ago: The moron when asked why he was looking by the lamppost for his lost dime when he dropped it far from the lamppost replied, "The light is better here."

This essay, "Roots of Modern Disciplines," is taken from a manuscript in progress intended to lead to a monograph or book. The working title of the book is, *Toward a New Age of Enlightenment: An Effort to Improve the Quality of Decisions*. The section that may become a monograph is titled, "The Challenge to Our Thought Leaders." The outline for the three chapters that make up Part I or the monograph is as follows:

Chapter 1: Making Progress

- Understanding Progress
 - Two Concepts of Progress
 - Land Use as an Example
 - Making Progress with Relevance as Well as Rigor
- Academic Environment
 - Arts and Sciences in the Post World War II Era
 - Business Administration in the Same Era
- Evolutionary Progress in Disciplines
 - Roots of Modern Disciplines**
 - Real Estate
 - Further Institutional Change
 - The Real Thing: Rules, Tools and Fools

Chapter 2: Enhancing the Quality of Life

- Stages of Understanding
- Epistemology
- The Enlightenment: A Philosophical Shift
- Social Science
- Our Role in Quality of Life

Chapter 3: Evolution to the Age in Which We Live

- Paradigm Shifts
- Scientific Revolution
- The Way Our Culture Works
- Illustration of Some Concepts
- Rules to by which to Live

As some readers may note, a number of the previous essays have been adapted to become part of this larger work. These essays are on the Hoyt website. Readers interested in seeing the several chapters for review and comment should send their request to mseldin@hoyt.org.