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Interdisciplinarity: History, Theory, and Practice. Julie Thompson Klein.
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U.S. Higher Education is generally recognized as the best in the post-contemporary world, thanks to increased democratization of access, inter-institutional competition, and "consumer choice." Paradoxically, planned institutional change, effectively implemented in general education and in research at the most fundamental levels is of critical importance because of epochal change occurring right now, due primarily to technology, the continuous information explosion, and ethnic emergencies.

General Education. John Searle convincingly argues that today a reasonably well-educated person knows his or her own intellectual, cultural and spiritual traditions and how they came to be shaped as they are. This demands not only political and social history, but also some familiarity with the literature and philosophies within one's own traditions. But one cannot understand one's own traditions without seeing them in relationship to other traditions, which is why other traditions and cultures have to be studied as well as one's own. As with traditions and cultures, so with language. You cannot really understand your own language until you have mastered another so that you can read and speak that second language with some ease and fluency.

You also have to be able to express your thoughts and viewpoints with cogency and clarity in writing and speaking. You cannot write and speak clearly unless you can think clearly. You can't think clearly if you cannot express your thoughts clearly in your own written and spoken words. Moreover, cogency of thought and argument presupposes at least minimal mastery of the skills and methods of logical analysis. These skills are not common today, even among academics.

The well-educated person today also knows at least something about how the national and global economy works with regard to trade cycles and the impact of changing interest rates on the value of one's own money, as well as on the currency of other peoples. You cannot be ignorant of these things and really understand the society and world in which you live. Furthermore, this well-educated person must know about the great advances in the natural sciences in general, but most particularly in physics and chemistry, and what those sciences are telling us by way of quantum mechanics, and the general and special theories of relativity, about the very construction of all material reality. Also, (s)he knows not only about how

Darwin transformed biology, but also something about the discoveries in microbiology and genetics on the one hand, and computer-based research on artificial intelligence on the other. Finally, one must also know how to learn continuously as an adult.

A major obstacle to the formation or development of this well-educated, post-contemporary person is the present organizational arrangement of the academy itself. This bureaucratic arrangement, although a human construct, is usually perceived and treated as a given, even, or especially within the academy itself. Not only have the academic disciplines become bureaucratized, but the very price the academic pays for becoming an academic is the price of professionalization—a *déformation professionnelle*, as the French call it. The academic is trained to see reality from within the viewpoint of his or her specialty, with a decided blindspot to what falls outside that specialty. A consequence of this specialization is that the more totally one identifies with one's specialty, the harder it is to realize that not only the academy, but society itself is a construct, not a given. Yet, at the core of this well-educated, post-contemporary person's view of reality is an acute awareness of the fragile precarity, the givenness, not only of the academic world, but of society itself. This sense of the precarity of social existence usually springs from an experience or series of experiences that expose society as something radically different from the social fictions that are taken for granted. The academic world shields itself from rather than exposing its own to the deeper meaning of such experiences, such as the German universities did under the Third Reich.

Even the generalists and the humanities scholars are not immune from this professional deformity, as this old quotation testifies:

Here I stand, my name is Jowett.
There is no knowledge, but I know it.
I am the Master of this College.
And what I don't know isn't knowledge.

(attributed to Benjamin Jowett, former Master of Balliol)

If a major aim or purpose of the academy is development of the well-educated, post-contemporary person who will not be overwhelmed by rapid change, then the radically inappropriate bureaucratic organization of the academy and the corresponding fragmentation of knowledge becomes glaringly obvious to all who realize that the very nature of post-contemporary thought and knowledge demands boundary crossings between disciplines and departments as they are now constituted. The need for such crossings becomes increasingly acute. Until the publication of Julie Thompson Klein's *Interdisciplinarity: History, Theory, and Practice*, the major work on this theme came from the Paris-based Organization for Economic Cooperation and Development's international seminar on the problems of interdisciplinarity in teaching and research in universities, in 1970. The results of this seminar were published as a book in 1972, and ever since, it has been the major resource on the subject. But because of the scope and completeness of her study, Klein's book will almost certainly replace the OECD book as the major resource for well into the twenty first century.

For anyone seriously interested in post-contemporary restructuring of knowledge, Klein's ninety-four page bibliography alone is worth more than the price of the book. Klein has set up her bibliography to serve as a foundation for reading and as a representative sample of a continuous outpouring of an already vast subject. Klein has coordinated her representative selections with the ERIC system. The bibliography is organized into seven sections:

- (1) Essential References:
containing bibliographies, books, special issues, and additional essential references.
- (2) Problem-focused Research:
including references on Interdisciplinary Research, computers, engineering, general systems, the environment, and agriculture.
- (3) Interdisciplinary Care and Services.
- (4) Education.
- (5) The Humanities:
including references on American studies, language and literature, linguistics, philosophy, and religion, with a separate section on history.
- (6) The Social Sciences:
including references on economics, geography, law, political science, and general systems with a separate section on anthropology, archeology, and ethnography, as well as one on psychology, sociology, and social psychology.
- (7) The Sciences:
including references on the sciences and technology with a separate section on biology, chemistry, and physics, and another on mathematics.

After studying this bibliography, one can easily enough find fault, point out contradictions, etc. But the truth is that no matter how organized, because of the detailed and demanding nature of the task itself of developing such a wide-ranging yet selected bibliography, inconsistencies, questionable exclusions, and contradictions are inevitable. The fact is that Klein's selected bibliography is the most complete in the English language, if not in any language. The bibliographic categories that Klein developed are themselves a restructuring of knowledge and an impressive achievement in social and institutional epistemology.

Klein's discussion of interdisciplinarity is organized into three sections, introduced by a consideration of the problem of interdisciplinary discourse. In Part One (Definitions of Interdisciplinarity), Klein addresses the evolution of interdisciplinarity, followed by a guided trip through a maze of interdisciplinarity, which she calls the "interdisciplinary archipelago," followed by an excellent interdisciplinary lexicon of Klein's own devising.

In Part Two, the (dialectical?) relationship between disciplinarity and interdisciplinarity is addressed, as is the rhetoric of interdisciplinarity, and a very rich and compact consideration of the phenomenon of borrowing, and finally, an illuminating discussion of "disciplined interdisciplinarity."

Part Three presents "the state of the art," including very useful information on problem-focused interdisciplinary research (IDR). Klein discusses six kinds of interdisciplinary curricula worldwide (i.e., interdisciplinary universities, four-year undergraduate programs, core curricula and clustered courses, individual courses, independent studies, and graduate and professional studies). Absent, however, from this discussion is a concrete example of a genuinely integrated curriculum, which could be of great help to the reader. In fact, a detailed description of the very program in which Klein herself teaches would be a rich addition to this part of the discussion.

Klein concludes her discussion of interdisciplinarity with what she calls the "interdisciplinary core," wherein she describes the "interdisciplinary individual," as having high tolerance for ambiguity, considerable ego strength, initiative, assertiveness, an habituated divergent thinker, and so forth. Of course, all academics are supposed to personify all of these admirable qualities, just as nearly all academics would immediately give at least verbal assent to the importance of interdisciplinarity, as they would, for example, to motherhood. Klein's presentation of this interdisciplinary individual strikes me as a transparently self-serving defense of the rigidity

of the academy as it perpetuates its peculiar brand of careerism. I cannot imagine Isaac Asimov, Steven Jay Gould, or the late R. Buckminster Fuller being interested enough in interdisciplinarity to study this book, because none of them could have survived for one minute totally within one academic discipline, nor can anyone else but the educationally deformed. Neither do I believe that the best graduate students would be interested—probably because they have not as yet been sufficiently deformed by the academy in their stance toward reality.

I have used Klein's book as required reading and discussion in a number of graduate courses. The consistent criticism coming from the most articulate and sensitive discussants is that the presentation of interdisciplinarity is not situated in a broader context, so that Klein opens herself to being called what one student described as an "academic technician." Strong words. Yet this same student, a former naval officer who had written a number of technical instruction manuals for the U.S. Navy, used such sources as *Z Magazine*, *In These Times*, *Mother Jones*, *The Nation*, *Tikkun*, and *Rolling Stone* to bolster his argument. His criticism of the book and of the academic world in the U.S., though very pleasantly stated, was deeply stinging. He made two additional but crucial points, both focusing on the nature and management of academic research.

[1] The best researchers have their own interests and questions that they are pursuing. Their research plans and energies spring directly from these interests and questions that are at once personal and professional in the sense that Polanyi says that all knowledge is personal. Only the research hacks go where the grant money is when that is not where their own questions and interests lie.

[2] Citing M.I.T.'s Noam Chomsky and his well known struggle of conscience and continuously steadfast commitment to "expose lies and tell the truth," with regard to U.S. involvement in Viet Nam, when M.I.T. was receiving about 95% of its external funding from the Pentagon, this former naval officer made the point that until the academic world of research has the integrity to reject large scale external funding when the funding is for purposes that are not in line with well-defined and stated purposes of the university, it does not really know, nor perhaps even have its own clearly defined boundaries.

For the North American research university to be able to say no, and state clearly the reasons for its refusal to an external funding agency, even when that agency is a highly respected institution, means that the research university must first have a clearly-defined and stated set of purposes and aims to which it is committed. This is exactly the framework that is missing from Klein's discussion. But in fairness to Klein, the North American Academy itself has done little or nothing to provide such a framework of purpose and value. Perhaps it is not quite fair to expect that Klein could also have provided such a framework. As her study stands, it is required reading for any and all who understand the amoral academic labyrinth.