

## Chapter 12 Subject Matters, Topics, and Curricula

### § 1. The Curricular Principle of the Natural Process of Learning

All human beings learn *from* particular concepts *to* general concepts in the synthesis of understanding. Only after a new general concept has been synthesized from particulars and placed in the manifold of concepts does it become possible, by means of an episylogism, to deduce additional particular ones from that general concept [Wells (2011)]. This is a theorem of mental physics from which the *natural* role and place of subject matters and topics in instructional education is understood. This nature is such that ***instruction by presentation of general concepts without prior particulars is ineffective***. To understand this ***curricular principle***, let us overview the process of synthesizing concepts and combining them in the manifold of concepts.

The process begins with the ***synthesis in sensibility*** of apprehension and apperception. Figure 1 illustrates this. Within sensibility the matter of representation (*materia ex qua* of sensibility) can come from two different sources. The first is by receptivity of *psyche* and provides two distinct types of *materia*: (i) the *materia ex qua* of the five classic external senses (sight, sound, touch, taste, smell); and (ii) somatic body-state data (balance, muscle stretch, nociception, pressure, heat, cold, etc.), which is called kinaesthetic feedback. The second source of *materia ex qua* in sensibility originates from the manifold of concepts and is reproduced in sensibility by the synthesis of reproductive imagination.

Sensory data represented in sensibility: (i) can remain unconscious, in which case the representation is said to be *obscure* representation; or, (ii) it can be subjectively perceived via the synthesis of apperception as affective perception; or, (iii) it can be objectively perceived via the synthesis of apperception and presented *in* an intuition as its matter. Kinaesthetic feedback data can likewise remain obscure or be presented as affective perception. However, it cannot be made matter in an intuition. Rather, this data is processed as *materia circa quam* for the representing of

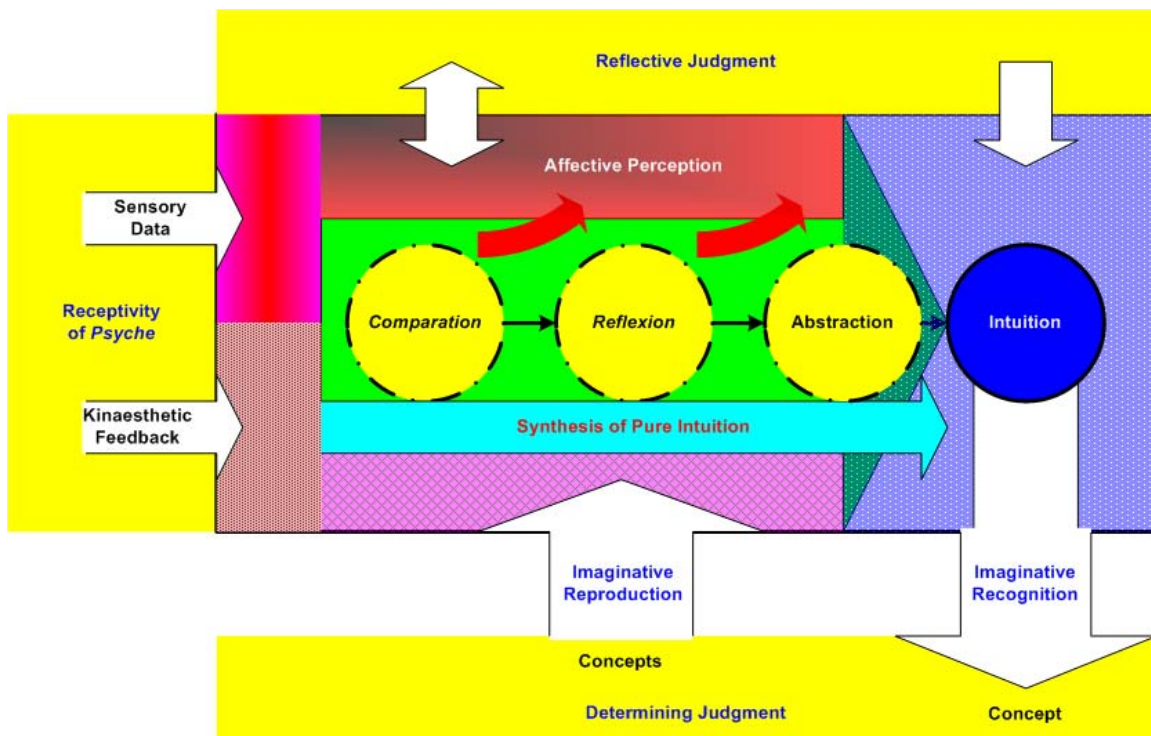


Figure 1: The synthesis in sensibility.

topological structures; topological structures constitute the *outer form* of an intuition. This process of topological structuring is called *the synthesis of the pure intuition of space* [Wells (2009), chap. 3]. Kant also called it the pure intuition of outer sense.<sup>1</sup> It is worthwhile to note that Piaget & Inhelder (1948) discovered that an infant's earliest perceptions demonstrate a capacity for topological perception that is exhibited by newborns in the earliest stage of life:

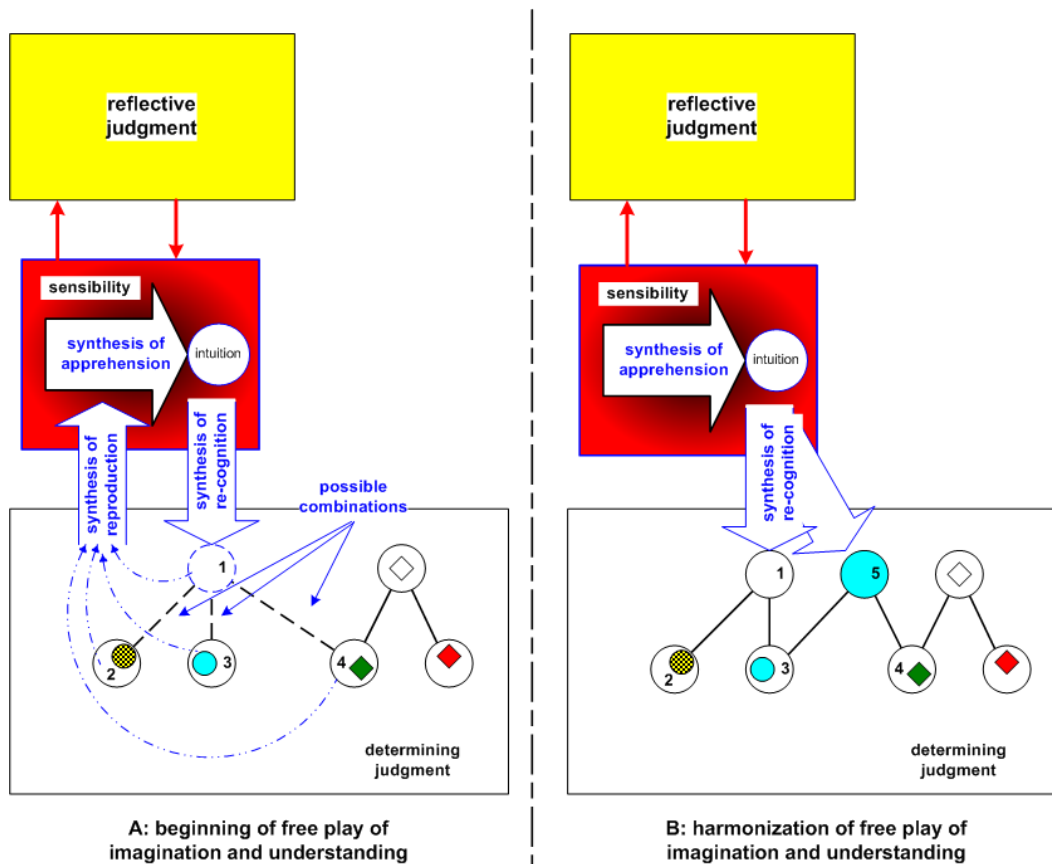
Geometry primers are almost unanimous in presenting the fundamental ideas of space as resting upon Euclidean concepts such as straight lines, angles, squares, circles, measurements, and the like. . . . On the other hand, abstract geometrical analysis tends to show that fundamental spatial concepts are not Euclidean at all, but 'topological'. That is to say, [they] are based entirely on qualitative or 'bi-continuous' correspondences involving concepts like proximity and separation, order and enclosure. And, indeed, we shall find that the child's space, which is essentially of an active and operational character, invariably begins with this simple topological type of relationship long before it becomes projective or Euclidean. [Piaget & Inhelder (1948), pg. vii]

There is no capacity for judgment in the processes of sensibility. As Kant put it, sensibility can not err because sensibility does not judge. Affective perceptions and intuitions are marked as such by the process of reflective judgment. In this deep sense it can be said that everything we learn we learn via *subjective* judgments (judgments of perception). The synthesis of an intuition, in regard to the matter it contains (its *materia in qua*), is carried out in a three step process: (1) the process of *Comparison* (which is a process of logical comparison; mathematically, it is the construction of equivalence relations); (2) the process of *Reflexion* (which is a process of determining how compare representations can be apprehended in *one* act of apperception; mathematically, it is the construction of congruence relations); and (3) the process of *Abstraction* (segregating everything from a representation by which the compare representations providing the *materia ex qua* of that representation differ with regard to the reflective judgment of practical expedience in *making* that representation). The logical sequence of these *acts of understanding* (*Verstandes-Actus*) are shown in figure 1 [Wells (2009), chap. 3]. Objective perception is represented by intuitions that are marked by acts of the process of reflective judgment. Affective perceptions, in contrast are non-objective perceptions. The *materia in qua* of an intuition is called *sensation*; that of an affective perception is called *feeling*.

An intuition marked by reflective judgment is *transformed* into a concept by the synthesis of re-cognition in imagination. A concept is nothing else than the representation of *a rule for the reproduction of an intuition* and a concept always has for its direct object that intuition. As a mental phenomenon, *understanding is combination of concepts in the manifold of concepts*. This combining is adjudicated by the process of determining judgment but always involves a synthesis in which sensibility, imagination, and determining judgment interact with one another. Kant called this interaction *the free play of imagination and understanding*. Arguably that might not be the clearest description of the process, but it will do. This free play is a localized process bringing

---

<sup>1</sup> There is a second synthesis-of-form process at work in the synthesis of apprehension. This process is an order structuring process and is called the synthesis of the pure intuition of time [Wells (2009), chap. 3]. While the synthesis of the pure intuition of space is applied to the form of an intuition, the synthesis of the pure intuition of time is applied to both intuitions and affective perceptions. Kant called this the synthesis of *inner* sense. It is worthwhile to note that the work of the Bourbaki mathematicians in the 1950s proved that all of mathematics can be constructed from three fundamental 'mother structures': topological structure, order structure, and algebraic structure. We find in the synthesis of pure intuition in sensibility two of the three structuring capacities necessary for mathematics as we know it to be possible. Algebraic structure is made possible by the synthesis of understanding, and thus we find in the process of sensibility and its interplay with determining judgment (via imagination) everything necessary to make mathematics possible. I.e., we find here the causative explanation of mathematics itself.



**Figure 2:** Illustration of the synthesis of understanding. A: conditions at the beginning of free play of imagination and understanding. B: final conditions when harmony of imagination and understanding is achieved. The circles depicted in the determining judgment block denote concepts and the solid lines depict combinations of concepts forming part of the manifold of concepts.

representation in sensibility and representation in the manifold of concepts to an equilibrium state of agreement with each other. Kant referred to this equilibrium state as a *harmony* in free play of imagination and understanding, which merely means that representations in both sensibility and the manifold of concepts are co-expedient according to acts of reflective judgment. I call this overall process of synthesis *the synthesis of understanding*.

Figure 2 provides an illustration of the synthesis of understanding. A more detailed discussion of this synthesis is provided in Wells (2009), chaps. 5-6, but here a briefer discussion will suffice. The cycle of free play of imagination and understanding begins when an intuition in sensibility is marked by reflective judgment and transformed into concept 1 in the manifold of concepts. The act of reflective judgment called an *inference of judgment* and brings the operation of determining judgment under the rule of the acroam of formal expedience in Critical metaphysics [Wells (2009), chap. 6; Kant (1800), pp. 131-133].

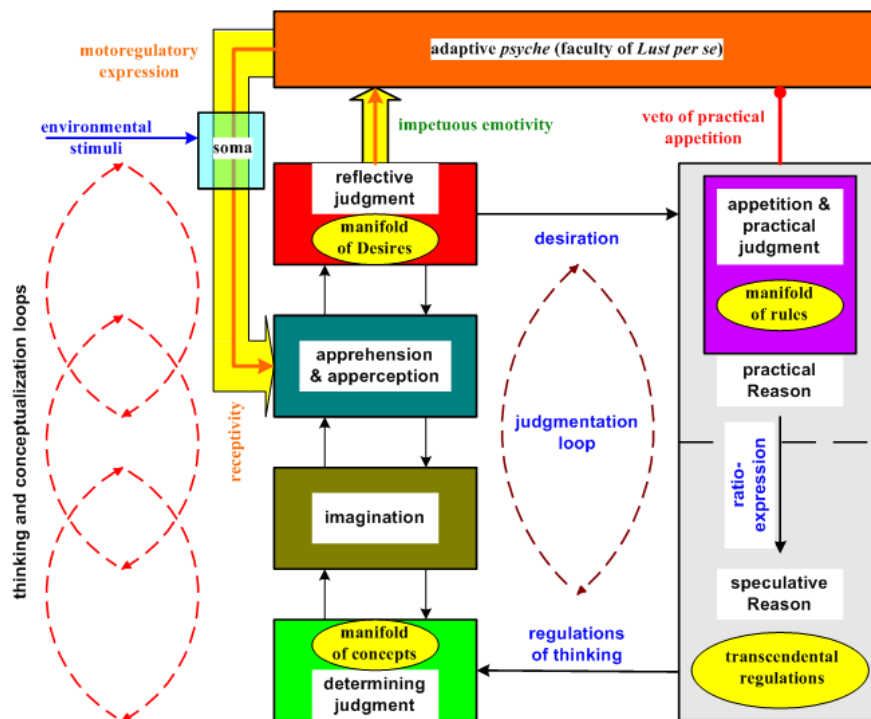
Concept 1 in figure 2A initially has no context in the manifold of concepts because it is a new concept uncombined with the other concepts. The act of re-cognition in imagination, however, provides this concept with transcendental schemata of time determination by which it can be logically associated with other concepts 2-4 in figure 2. These are "swept up," in a manner of speaking, by the process of reproductive imagination and, along with concept 1, are re-introduced back into the synthesis of apprehension and jointly undergo the processes of *Comparison*, *Reflexion* and *Abstraction* again. Imaginative re-synthesis of apprehension is called a *synthesis of*

*comprehension*. This re-synthesis in sensibility and the synthesis of the problematic inferences of understanding by acts of determining judgment [Wells (2009), chap. 6; Kant (1800), pp. 116-119] are in free play in this dynamic but the dynamic itself is *regulated* by the process of Reason and thus the co-determined syntheses constitute what is called an *inference of reason* [Wells (2009), chap. 6; Kant (1800), pp. 120-131]. Figure 3, reproduced here for convenience of visualization, details the mathematical schematic of the overall process. The two jointly regulated syntheses in sensibility and determining judgment are part of the overall cycle of judgmentation (figure 4).

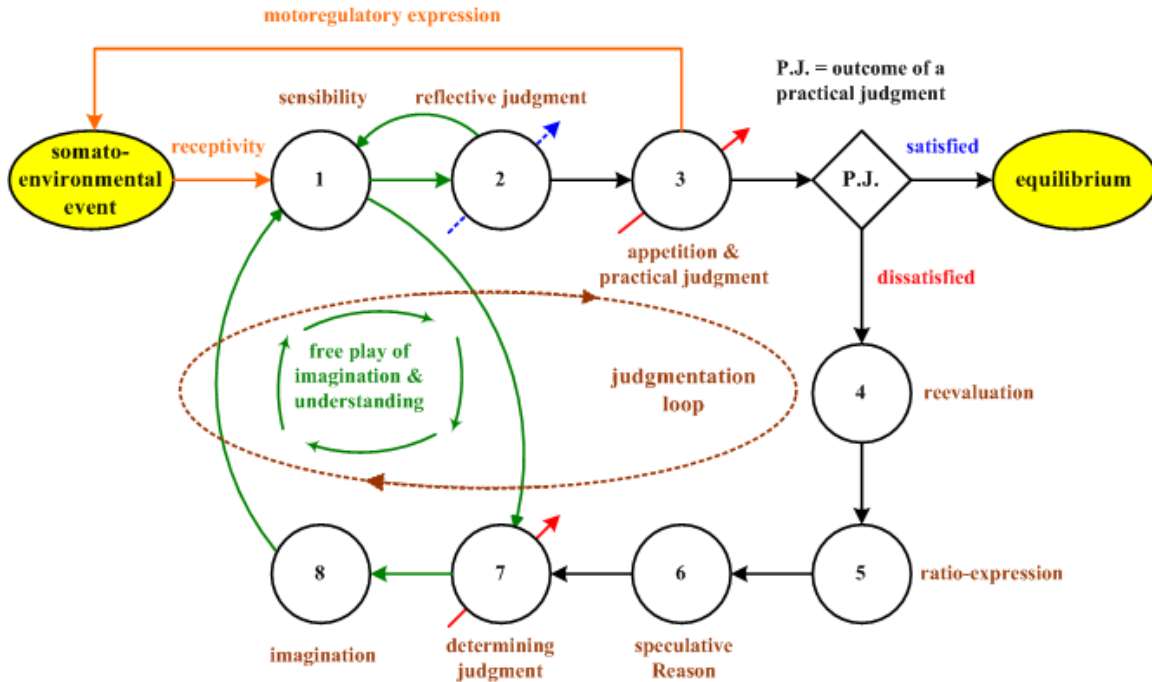
The imaginative cycle of apprehension → re-cognition → concept reproduction → apprehension &etc. continues until the synthesis in sensibility and the synthesis in determining judgment reach a state of joint equilibrium. This condition is called a *harmony* in the free play of imagination and understanding (figure 2B). For the illustrative example illustrated in figure 2, this harmonization culminates in concepts 2 and 3 being combined under concept 1. They are said to be "contained *under*" concept 1, and concept 1 is said to be "contained *in*" concepts 2 and 3.

In this example, concept 4 ends up being excluded from combination with concept 1 by the process of Abstraction in the synthesis in sensibility. However, it is important to understand that the synthesis in sensibility produces as many representations of intuitions as are found formally expedient by reflective judgment. In the language of signal processing theory, the synthesis process carries out "parallel processing." This can (and often will) produce other additions to the manifold of concepts (e.g. concept 5 in figure 2), and each must be combined with other concepts to produce the *context* of concepts necessary for the possibility of *real* meanings in conceptualization. In the illustrative example, concept 4 ends up standing under concept 5 (as does concept 3) and concept 5 understands both concepts 3 and 4. Concept 1 understands concepts 2 and 3.

I think it is worth mentioning that the mathematical structure depicted in figure 2 and within figure 3 is a structure very familiar to embedding field theorists. The structure constitutes what is



**Figure 3:** Mathematical structure of the phenomenon of mind depicting the regulation of perception and understanding by the process of Reason via transcendental regulations of thinking.



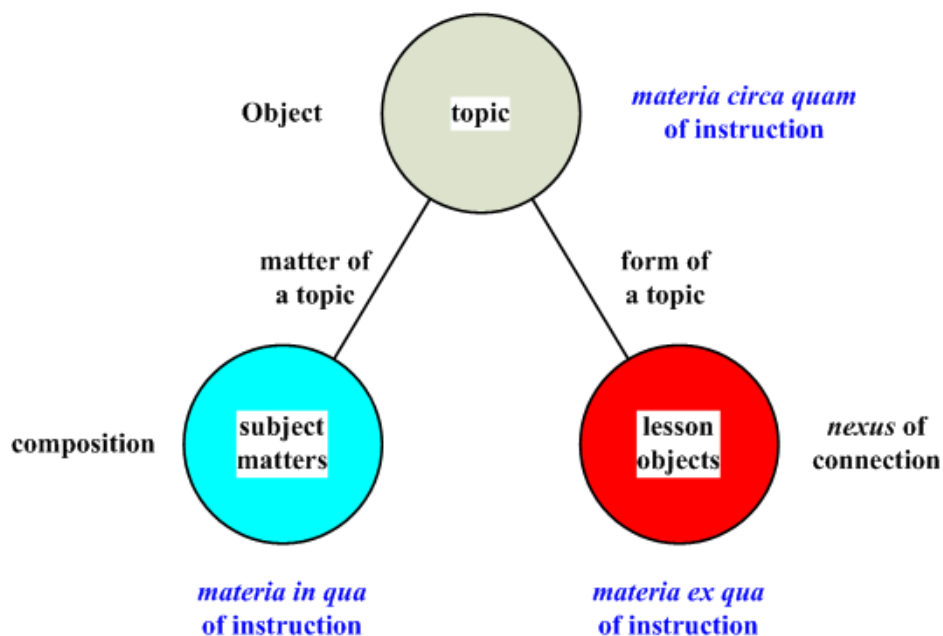
**Figure 4:** Logical flow of syntheses in judgmentation and the synthesis of understanding. This diagram operationally defines the motivational dynamic in judgmentation. The red adjustment arrows at nodes 3 and 7 denote accommodations made in the manifold of rules and the manifold of concepts, respectively. The dashed blue adjustment arrow at node 2 denotes short-term changes in the manifold of Desires.

known as an "adaptive resonance network" [Grossberg (1976)]. What Critical theory calls a "harmony" in the free play of imagination and understanding is called a "resonance" in adaptive resonance network theory, and because the manifold of concepts undergoes long term accommodation during the synthesis of understanding this resonance is called an "adaptive resonance." The discovery of adaptive resonance networks and adaptive resonance theory is one of the epochal achievements of embedding field theory mathematics. Among other things, this theory provides a putative mathematical description for the phenomenon of memory [Grossberg (1978)]. Mental physics provides the causative explanation needed to link speculative mathematics with the phenomenon of mind.

Subject matters are particulars from which instructional topics are built. The synthesis that has just been discussed tells us that for the learner to understand a topic of instruction he must *first* be presented with several examples (for which he already has contexts in experience) before he can comprehend the topic. But what is the precise distinction between a topic and a subject matter?

## § 2. Topics, Subject Matters, and Curricula

Something I want to make clear is that by 'subject matter' I am **not** talking about 'courses.' A *course* is a particular organized block of activity and time for instructing learners in regard to particular lesson objects. As previously discussed, lesson objects are synthesized for the purpose of uniting learner purposive objects and Society's instructional objects. Courses and curricula organize the scheduling and presentation of lesson objects. A second thing I want to make clear is that although I discuss *topics* of instruction (e.g., mathematics, science, literature, etc.) in this chapter and those that follow, I am **not** proposing a universal curriculum or even so much as a set of universal courses. I am discussing *subject matters* of public education. This is not the same thing as topics, courses or curricula although it is obviously related somehow to all of these.



**Figure 5:** Critical real explanation of a topic as an Object and its relationship to subject matters and lesson objects in instruction. A curriculum organizes and serializes topics according to the curricular principle.

Figure 5 illustrates the real relationship between a topic, subject matters that go into the actual composition of that topic, and the lesson objects that provide the *nexus* of connections among the topic's subject matters. In relationship to instruction activities, a topic is the *materia circa quam* (matter around which) of instruction; subject matters comprise the *materia in qua* of instruction; and the lesson objects are the *materia ex qua* of instruction. The *form* of instruction activity subsists in the communication transactions between teacher and learner.

In the context of instructional education, the Critical real explanation of a **topic** is *the general Object of discourse to which instruction pertains*. It is also called a 'topical object' when the topic is being regarded as a thing. A **subject matter** is *a particular idea, concept or fact pertaining to a topic about which a learner is to be instructed*. Lesson objects were discussed in the previous chapter and will be further discussed in the next section. A **curriculum** is *a planned program of study used as a methodology for helping a learner move from a limited ability to Self-develop only by acting as a pupil to a general ability to Self-develop by acting as a student*. A curriculum is comprised of an organized totality of courses organized according to the curricular principle and taught to learners by teachers. These explanations lay out the Critical distinctions needed to comprehend instruction compatible with natural learning. It may seem to some people that these are hairsplitting distinctions but my reply is that homonymous use is often made of these terms in present day discourses on education. As Aristotle implied in *Categories*, the use of homonyms in science leads to confusion and error, and therefore scientists should avoid using them.

The reason I am not going to discuss courses or propose a common curriculum stems from the social contract and the phenomenon of distributed special interests found in every large Society. This was a fundamental consideration in the previous chapters of this volume and it continues to be a fundamental consideration for topic selection, course design, and curriculum organization. These have to be designed taking into account the layered interests of individual learners, local Communities and mini-Societies, and national common interests. None of these interests can be subordinated to the others and all must be adequately addressed at each level of the inverted pyramid structure discussed in the earlier chapters of this volume. Servicing these interests across the social spectrum of a great nation does require coordination and cooperation; it does not and



*cannot* require a one-size-fits-all institution of public instructional education.

The U.S. education establishment is presently evolving education reforms promoting the idea of a 'common core' curriculum and, along with it, a set of universal 'standards' for evaluating the performance of the institution of public instructional education. One example of a vision of and argument for these is provided by Cohen (2010-11). The arguments are cogent and they are persuasive *if* one accepts the presuppositions and premises upon which they are based. However, I reply that these presuppositions and premises *contradict human social nature* and for that reason it is not possible for reforms of this type to succeed. No unnatural undertaking can succeed in producing desired results.

I repeat the thorough-going theme of *The Idea of Public Education*, namely, *the institution of public instructional education must be grounded in the human nature of the 'social atoms' and nothing that gainsays this nature can be justified under a social contract or can succeed in fulfilling a Society's purposes in its institution of public instructional education.* If the common core curriculum/standards reform movement has its way, it will repeat the missteps and disasters that resulted from the 20th century PEM reforms. The root causes will be the same: Taylorism, rulership, tyranny of a dominant minority, and institutionalized bigotry-by-stereotyping.

This error is not unique to either the 20th century or the present day. Common core proposals of one form or another were part of education proposals set out by some of the Founding Fathers in the nascent days of the Republic. Examples include Knox (1797; 1798), Smith (1797), and Rush (1798). The history of American education is a vivid testament to Santayana's famous *dictum*, "Those who cannot remember the past are condemned to repeat it."

Standardization is one of the arguments that is used to buttress the case for a 'common core curriculum' and is touted as a benefit possible only if there is a common core curriculum for it to be applied to. This fails to question whether standardization itself is a benefit. I answer that it is not because the very essence of the idea of a 'standard' removes by abstraction all considerations of *local* interests. This practically guarantees that at least some of these interests will be hindered or contradicted by the institution, and that inevitably leads to violation of the social contract. It is for that reason it must be concluded that standardization is *unjust*. Furthermore, standardization is a reliable historical mark of the breakdown and onset of disintegration of a Society [Toynbee (1946), pp. 555-566]. Toynbee focused on only three aspects of this, but standardization through a common core curriculum as a special case fits generically under the dominant minority aspect he outlines and, to a degree, to something he called a "higher religions" aspect. Toynbee found,

We have now arrived at the close of our inquiry into the process of the disintegrations of civilizations, but before we leave the subject there is one more question to be considered. We must ask whether, as we look back over the ground we have traversed, we can discern any master-tendency at work, and we do in fact unmistakably descry a tendency towards standardization and uniformity: a tendency which is the correlative and opposite of the tendency towards differentiation and diversity which we have found to be the mark of the growth stage of civilizations. [Toynbee (1946), pg. 555]

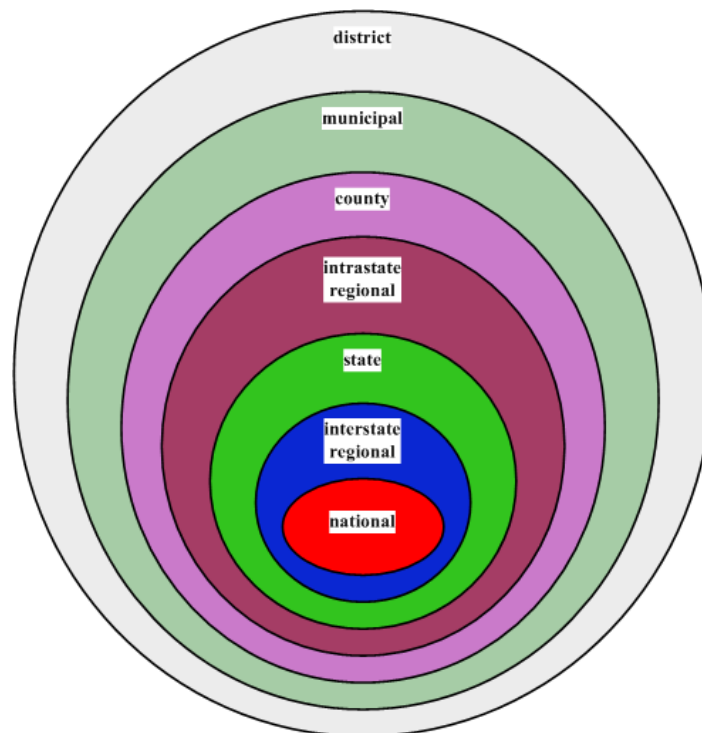
A common core curriculum is by its nature a curriculum imposed by authority figures organized as a centralized body, and this is nothing else than the cancerous incompetency of Taylorism at work. It is an immediate manifestation of the actual *Existenz* of a Toynbee dominant minority.

There are people who scoff at considerations like this and dismiss them as alarmist. It is in fact true that we who live today have not witnessed any 'great civilization' collapse and disintegrate on a scale comparable to, say, the disintegration of Hellenic civilization. But what was the collapse of the Soviet Union? It was a smaller-scale version of a Toynbee disintegration. What was the collapse of Lebanon signaled by the Lebanese Civil War of 1975-1990? What was the collapse of

Somalia? What is the ongoing upheaval known as "Arab Spring"? What is the Ukrainian civil war? These are all smaller scale examples of the general phenomenon of breakdown and disintegration of Societies. It is a fractal phenomenon repeated across the spectrum of human social organization. In the commercial sphere it is signaled by the death of once-successful commercial enterprises, of which fairly recent examples in the United States include Amoco, Bethlehem Steel, Circuit City, Compaq, Data General, Digital Equipment Corporation, F.W. Woolworth, Lehman Brothers, Levitz Furniture, MCI-WorldCom, Pan American Airlines, Tower Records, and Washington Mutual. The breakdown and disintegration of Societies is not something to be scoffed at or ignored. It is a fact of life and, moreover, a *preventable occurrence*. But it is not preventable by Taylorism. Taylorism *is* the hallmark symptom of breakdown and disintegration.

For public education the antidote to the poison of Taylorism is quite clear. Empirical Societies self-organize in layered scale structures across a span of increasing populations and geographical distribution. As the population and geographic span of organization becomes larger the common interests shared by all the Society's members become fewer and social contract constraints must necessarily become fewer and more specific if the Society is to have any practical hope of being and remaining a united Community. However, at every scale level there is a set of common albeit increasingly remote interests that are shared by all members of the Society. If this were not so the population would have no incentive or reason to unite itself in the body politic of one Union. The motto *E Pluribus Unum* imprinted on U.S. currency is intended to remind us of this. Thus, what is a common interest at the national level is an interest not foreign to the district level in the inverted pyramid structure of Republican institution of public education. Figure 6 illustrates this facet of U.S. socio-political structure.

It follows as a consequence that social contracting is likewise a scaled phenomenon because all social contracting is based on shared interests of the contracting people. Public education gets its sole justification from the local social contracts extending down to the district level of public education institution, and the institution itself exists to safeguard civil liberty and justice for all.



**Figure 6:** The overlap of interests from the district to the national level of Society organization.



It follows as a corollary to this that choices of topic, curriculum specification/design, and the authority to govern these selections and design processes are likewise characterized according to the social scale level of the education Institutes serving public interests at each scale. This means there cannot be just one common core curriculum but, rather, its antithesis is necessary: curricula designed to correspond to its mini-Society's population/geographic social scale level. It also follows as a corollary that topic selection and curriculum specification/design is a task that can only be assigned to the agency of the teachers associated with that scale level. Furthermore, these designs can be put into operation *only* after receiving the *advice and consent* of the legislative committee entrusted with governing public education at that scale level.

Among the social institutions affected by the scale phenomenon is the institution of public education itself. Public education *is* one of the social contract interests present in divers degrees at every scale level because civil liberty and justice under the social contract pertains to each specific level as a generic common interest. Some topics are propaedeutic to successful institution of public education. Cultivating the ability to read or the ability to do basic arithmetic are two of the more prominent examples of propaedeutic topics of instruction. It is not incorrect to say that a social interest in having the whole citizenry be literate and be competent in mathematics *are* aspects of the common interests of civil liberty and justice because each pertains to a person's ability to communicate and discuss issues pertinent to civil liberty and justice for all citizens. Those topical interests which are propaedeutic to education institution might be called 'common core' interests but this does not mean they are best served by a common core curriculum. Local socio-economic conditions and circumstances can and do affect how propaedeutic topics like reading are best treated by local education institution. Literacy is a common national interest; *how* this literacy is achieved is not a common national interest.

### § 3. Object Goals and Topical Teacher Preparation

The axiom that curriculum design and topic selection are tasks that must be part of what is vested in the expectation of authority for teachers at each level in the inverted pyramid has direct consequences for the training of teachers. One of these consequences can be stated in question form: What subject matter training is necessary for the possibility of teacher *Personfähigkeit* in regard to skills required for their task of making scientific institutions of curricula? This question goes straight to the core of the issue of teachers' Duties as public servants in whose offices is vested the expectation of authority in curriculum design and topic selection.

I hope it is trivially obvious to you that a teacher who cannot read cannot teach reading. I hope it is likewise trivially obvious that a teacher who does not understand mathematics cannot teach mathematics. The corollary should be likewise obvious enough: a teacher who cannot read cannot competently exercise the authority to determine where and how reading best enters a curriculum. The same comment holds for every conceivable topic that might vie for a place in a curriculum.

Teachers' colleges are not preparing teachers with the professional *Personfähigkeit* needed to exercise the authority the axiom calls on them to have. Mirel correctly points out,

Two other developments pertaining to the rise of schools and colleges of education made matters worse. First, between 1920 and 1950, state governments increasingly made schools and colleges of education the main institutions legally permitted to train prospective teachers for certification. With this development, the center of gravity in teacher training moved almost completely to education faculty members whose areas of expertise were in such fields as educational administration, elementary and secondary school teaching methods, educational measurement (i.e., testing), and educational psychology. While prospective high school teachers still had to take liberal arts courses in such areas as English, history, mathematics, and the sciences to meet state certification standards, the

certification bar often was quite low. In addition, increasing numbers of prospective elementary school teachers took many if not most of their courses in schools and colleges of education, leaving them with modest exposure to traditional liberal arts courses.

This trend relates directly to the second development that undermined the quality of teacher education – the diminished weight given to liberal arts knowledge in teacher training curricula. Beginning in the 1920s and continuing to the present day, many faculty members in schools and colleges of education adopted ideas rooted in progressive education that paid considerably less attention to curricula based in the liberal arts. [Mirel (2011), pp. 7-8]

I will add that *if* there is a weakness in Mirel's essay it is that most of what he correctly criticizes teacher training for in regard to 'the liberal arts' should also be said of the technical arts (science, mathematics, rudimentary engineering skills), economics and business, history, and psychology – fields of knowledge his essay does not reach. A teacher cannot adequately teach a topic about which he knows nothing substantive or, what is worse, that he substantively misunderstands.

Consider the 'expertise' that does characterize most faculty members in teachers' colleges: educational administration (Taylorism); teaching methods (pedagogy); educational measurements (testing); and educational psychology. I probably do not need to say again that Taylorism is a cancerous incompetency antithetical to the Idea of the American Republic, antisocial in its essence, Un-Republican in its methods, and destructive in its effects. As for pedagogy and learner psychology, these cannot be separated in any scientific and practically effective way in light of the previous remarks made in this treatise and of what mental physics finds to be true of human nature. In any case, although pedagogy and psychology are inseparable in effective practice, the psychology component must itself be sufficiently sound that pedagogy based on it is based on an accurately predictive and causative doctrine. This cannot be said to characterize the state of American psychology. Science writer Morton Hunt said of the state of present day psychology:

What is true of psychologists and their activities is equally true of their field of interest: though called a science, it is too heterogeneous to be defined or described in any but the most general terms. . . . In the course of half a dozen years the [*Annual Review of Psychology*] covers roughly a hundred different fields, each with its own subtopics, any of which could consume a researcher's full time and effort.

Can any discipline so untidy, multifarious, and disorganized be called a science? Are we justified in believing that its statements about human nature and the human mind are scientific truths? . . .

In the natural sciences, knowledge is cumulative and moves toward a deeper understanding of nature. . . . Psychology, in contrast, has spawned many special theories that either later were disproved or that turned out to apply to so limited a range of phenomena as to provide no basis for a larger and more inclusive theory. Behaviorism is the prime example.

Psychology, furthermore, is rife with what Jerome Kagan calls "unstable ideas" – concepts and theoretical statements that do not refer to fixed and unchanging realities but are subjective and variable. . . . None of this means that psychology is not a science. But it is not a coherent science with a coherent and comprehensive theory; it is an intellectual and scientific jumble sale. [Hunt (1993), pp. 640-641]

Kant said this *does* mean psychology is not yet a science. Particular mini-theories under the umbrella term 'psychology' are, in many cases, sciences but 'psychology' as a whole is not. Hunt's assessment of the current state of psychology is more or less the same as that of Reber & Reber:

Psychology simply cannot be defined; indeed, it cannot even be easily characterized.

[Reber & Reber (2001)]

Obviously no blame can be attached to college of education educologists for the chaotic state of American psychology. It is not so clear that educologists' habits of embracing speculative psychology fads, and accommodating teacher training to fit them, is not an imputable fault. The psychologists I know and have worked with are much less sanguine about what their research does and does not tell us than are educologists and pop writers. The fact several famous men in early 20th century education psychology exhibited choleric arrogance in the claims they made has not been a legacy passed down to the present day community of psychologists. Educologists, in contrast, have an established track record of darting from one fad to another without the least effort to independently verify the unfounded claims made by those fad theories. At the same time, it must be remembered that educologists by and large received *no* training in a scientific practice of psychology when they were students and so have never really been in a position to be *able* to test the fads they have sanguinely embraced one after another. Like all human beings, they are satisficing problem solvers prone to type- $\alpha$  compensation behaviors.

As for testing, a test should be a scientific measurement having the goal of ascertaining the effectiveness of the *teaching* that has taken place. The reality in schools today is that most testing is: (1) regarded as a measure of the *learner's* performance and ability instead of as a measure of the effectiveness of instruction; and (2) provokes an emphasis on memorization rather than on a cultivation of the learner's understanding and skills. On the other hand, and for the same reason as above, teachers receive no adequate training on the design of tests nor on proper scientific goals of testing. It is therefore no wonder that most tests are misused and their results misanalyzed.

It would be misdirected to look for villains or villainous intentions in any of this. The root cause of poor institution of teacher education is the same as the root cause of poor institution of education in any other field you could name: *disciplinary overspecialization neglecting breadth of knowledge*. This is a direct lineal descendent of an ungrounded philosophical prejudice that goes all the way back to the Greeks of the Hellenic era. This speculative prejudice has been passed down from each generation to the next without any reality check, much less any scientific examination. The leading spokesman for this prejudice is, unsurprisingly, Plato:

We surely agreed, if you remember, that it is impossible for one man to do the work of many arts well. . . . Can we suppose, then, that while we were at pains to prevent the cobbler from attempting to be at the same time a farmer, or a weaver, or a builder instead of just a cobbler, to the end that we might have the cobbler's business well done, and similarly assigned to each and every man one occupation for which he was fit and naturally adapted, and at which he was to work all his days, at leisure from other pursuits and not letting slip the right moments for doing the work well, and that yet we are in doubt whether the right accomplishment of the business of war is not of supreme moment? [Plato (c. 4th century BC): II, 374A-D]

This prejudicial premise is at the root of the antlike communism of Plato's *Politeía* as well as its modern day descendent reflected in the old saw about "jack of all trades, master of none." But the premise is untrue. The Renaissance era demonstrated this, as does the fact that there have been many historical examples of polymaths: Benjamin Franklin, Leibniz, da Vinci, Archimedes, *et al.* Neither is this premise necessary for that productive economic phenomenon called 'the division of labor' [Smith (1776), pp. 4-19]. The only thing required to effect a division of labor is to divide the labor. Human beings are not so one dimensional as Plato's prescription would have them be. Any person is capable of acquiring practical depth in several fungible skills without any necessity to sacrifice adequate breadth in others. Indeed, without individuals who possess adequate breadth of understanding and skill it is not possible for people to act in aggregation to achieve a common goal with the unity and synergy essential for the success of their divers efforts. A great deal of

wisdom is contained in the old quip, "A specialist is a person who knows more and more about less and less until eventually he knows everything about nothing. A generalist is a person who knows less and less about more and more until eventually he knows nothing about everything."

American higher education – where teachers and others who study what are often pompously called "the professions" are trained – has been granulated into isolated silos of knowledge ever since the American higher education reforms of 1880-1910 [Vesey (1965), 57-179]. Some of the collegiate reforms of this period were unarguably beneficial. But the erection of isolated silos of knowledge was not and produced seriously damaging long term effects. Veysey remarked,

In two important ways . . . the growth of research produced basic changes in the nature of American higher education. Responsibility for the first change, a tendency toward ever increasing specialization of knowledge, it shared with the movement toward practicality. The second, the liberation of the intellect for its own sake, resulted more exclusively from the climate of abstract investigation, although intellect was eventually to owe a certain degree of its increasing acceptance to advocates of liberal culture.

The dominant characteristic of the new American universities was their ability to shelter specialized departments of knowledge. To the extent that these departments represented vocational aspirations, the desire for a practical version of higher learning had set the tendency toward specialization in motion. . . . That a scientific outlook would bring with it an inexorable drift toward specialization of effort should have seemed natural to any observer versed in Western traditions. . . . In consequence, the old-time professor who was jack-of-all-disciplines rapidly disappeared from all but the bypassed small colleges. . . . The most pronounced effect of the increasing emphasis on specialized research was a tendency among scientifically minded professors to ignore the undergraduate college and to place a low value on their function as teachers. [Veysey (1965), pp. 142-144]

Today's fatal shortcomings in teacher training are *systematic*, *institutionalized*, and *shared by the other disciplines*. The crippling effects of institutionalized overspecialization are perhaps most publicly visible in the case of teachers, but no less crippling for the divers disciplines of physical science, engineering, mathematics, business, economics, political science, law, medicine, history, and literature. Mirel lamented the gap separating educology professors and liberal arts professors; but everywhere in higher education seriously debilitating gaps are institutionalized. The worst part of the drift into overspecialization is that the fundamental ground of justification for *public* higher education has been abandoned in the process. A *private* college, of course, is at liberty to train students to be narrow specialists with singular fungible skills in currently popular disciplines while ignoring the fact this sets those students up for future personal financial disaster when those skills are no longer in demand and, because of inadequate education, they lack the ability to acquire different skills that come into demand. A *public* Institute of higher education has a public Duty mandated by the social contract. This Duty was stated by Benjamin Rush:

"Your government cannot be executed. It is too extensive for a republic. It is contrary to the habits of the people," say the enemies of the Constitution of the United States. However opposite to the opinions and wishes of a majority of the citizens of the United States these declarations and predictions may be, they will certainly come to pass unless the people are prepared for our new form of government by an education adapted to the new and peculiar situation of our country. [Rush (1788), pg. 101]

Rush's prediction has come to pass. The issue and question is: What sort of public education preserves the Republic? That is the issue addressed in volume I of this trilogy, *Education and Society* [Wells (2012)]. In Rush's essay his attention was on the idea of a federal university, but this Duty of public education runs up and down through every level of the inverted pyramid.

And this segues us back to the topic of this section: What topical preparation do teachers need

in order to fulfill this Duty and to be prepared to take up the authority that, as public servants, the public justly expects them to wield? It cannot be a deep and isolated specialist's preparation because that preparation leaves them unprepared to design, organize, and implement curricula suited to *all* the interests pertinent to the level of their school Institute. It cannot be so broad and general that it leaves them unable to teach *topics* in adequate detail because then the pupils or students are *institutionally* frustrated in the cultivation of each one's individual *Personfähigkeit*. The necessary preparation lies, therefore, somewhere in between these extremes.

It cannot be presumed that the topical preparation of teachers can be statically defined. Socio-economic circumstances change over time and public education must track these changes. There was a time when it was needful for teachers to know how to make quill pens; that particular skill is not part of the present day needs. For a few decades in the mid-twentieth century glassblowing was a skill taught to electrical engineers in their college curriculum so they could make vacuum tubes; glassblowing is no longer part of the skill set needed by an electrical engineer. At the same time, a variety of practical reasons find against introducing short-term "faddish" topics or topics of a too-specialized nature into curricula. Topic selection is to a significant degree an empirical art guided by an educational necessity to have **object oriented goals** to be met by topic selection.

Within the framework of an HP-MBO system of education management, object oriented goal setting is a *cooperative* effort between the legislating education committee (to ensure that stakeholders in public education have their interests represented) and teachers. The committee's role in this goes no farther than object identification and does not extend to course identification, lesson object design, or pedagogy. These latter require technical design considerations peculiar to the craft of teaching and for that reason have to be left in the hands of the teachers.

One notable historical example of object oriented goal setting for American public education was provided by the state of Virginia in the early 19th century. It is documented in Jefferson's "Report of the Commissioners for the University of Virginia" [Jefferson (1818)]. The report dealt with object oriented goals for both "primary schooling" (grades 1 through 8 or 9) and "higher" education (corresponding to today's high school, junior college, and four-year college). The report also touched upon propaedeutic topics to be addressed in the early years of "primary schooling." The propaedeutic object goals the report identified were as follows:

To instruct the mass of our citizens in these, their rights, interests, and duties as men and citizens, being then the objects of education in the primary schools . . . in them should be taught reading, writing and numerical arithmetic, the elements of mensuration (useful in so many callings,) and the outlines of geography and history. [Jefferson (1818), pg. 334]

These skill objects are still propaedeutic in all four headings of learner *Personfähigkeit* (corporal, intellect, tangible, and persuasion). The education object goals identified by the commissioners for primary education were:

To give to every citizen the information he needs for the transaction of his own business;  
To enable him to calculate for himself, and to express and preserve his ideas, his contracts and accounts in writing;  
To improve, by reading, his morals and faculties;  
To understand his duties to his neighbors and country, and to discharge with competence the functions confided to him by either;  
To know his rights, to exercise with order and justice those he retains; to choose with discretion the fiduciary of those he delegates; and to notice their conduct with diligence, with candor, and judgment;  
And, in general, to observe with intelligence and faithfulness all the social relations under which he shall be placed. [Jefferson (1818), pp. 333-334]

**Table 1**  
**Elementary School Curricula**  
1775 to 1900

1775	1825	1850	1875	1900
READING Spelling Writing <i>Catechism</i> BIBLE Arithmetic	READING * <i>Declamation</i> SPELLING * <i>Writing</i> <i>Good Behavior</i> <i>Manners &amp; Morals</i> ARITHMETIC *	READING DECLAMATION SPELLING WRITING Manners Conduct MENTAL ARITH. * CIPHERING	READING <i>Literary Selections</i> SPELLING PENMANSHIP * Conduct PRIMARY ARITH. ADVANCED ARITH.	READING * LITERATURE * <i>Spelling</i> <i>Writing</i> * Conduct ARITHMETIC *
	Bookkeeping GRAMMAR Geography	Bookkeeping Elem. Language GRAMMAR <i>Geography</i> History of the U.S.	Bookkeeping <i>Oral Language</i> * GRAMMAR <i>Home Geography</i> * TEXT GEOGRAPHY U.S. HISTORY <i>Constitution</i>	Bookkeeping ORAL LANGUAGE <i>Grammar</i> <i>Home Geography</i> TEXT GEOGRAPHY <i>History Stories</i> TEXT HISTORY
	Sewing & Knitting	Object Lessons Sewing & Knitting	Object Lessons * Elementary Science * Drawing * Music * Physical Exercises Sewing & Knitting	<i>Nature Study</i> * Elementary Science <i>Drawing</i> * <i>Music</i> * Play Physical Exercises Sewing Cooking Manual Training
CAPITALS = Most important subjects. <i>Italics</i> = Subjects of medium importance. Roman = Least important subjects. * = New teaching methods employed.				

Cubberley (1919), pg. 327; Wells (2013), chap. 9

To some extent these objects were reflected in primary school topics typically offered in most of the primary schools in the 19th century United States (Table 1). Not all of these objects were explicitly covered; the political science aspects were noticeably lacking, for example. After the Civil War of 1861-65, curricular topics began to reflect new pedagogy theories that had been developed in Europe in the early years of the 19th century (especially empirical Pestalozzian theory and so-called Herbartian theory, a brand of Hegelianism). Gradually over the course of the century the object oriented connections unique to the American Republic were divorced from curriculum and topic selection and design. This divorce dealt a severe blow to the American institution of public instructional education. However, it was the *disconnect* between the topics and the objects that was primarily responsible for this rather than the topics themselves.

In Jefferson's day the junior high school had not yet been invented and many of the topics now covered in high school were offered in colleges instead. High schools, as distinct from colleges, were a 19th century development. The Virginia commissioners provided a set of educational object goals for post-primary public education. Although topic-offerings distribution is different for the present day than it was in Jefferson's, the *object goals* of public education are not:

And this brings us to the point at which are to commence the higher branches of education, of which the legislature requires the development; those, for example, which are,

To form the statesmen, legislators and judges, on whom public prosperity and individual happiness are so much to depend;

To expound the principles and structure of government, the laws which regulate the intercourse of nations, those formed municipally for our own government, and a sound spirit of legislation which, banishing all arbitrary and unnecessary restraint on individual



action, shall leave us free to do whatever does not violate the equal rights of others;  
 To harmonize and promote the interests of agriculture, manufactures and commerce, and by well formed views of political economy to give a free scope to the public industry;  
 To develop the reasoning faculties of our youth, enlarge their minds, cultivate their morals, and instill into them the precepts of virtue and order;  
 To enlighten them with mathematical and physical sciences, which advance the arts and administer to the health, subsistence, and comforts of human life;  
 And, generally, to form them to habits of reflection and correct action, rendering them examples of virtue to others and of happiness within themselves. [*ibid.*, pp. 334-335]

Just ten years later our statesmen and legislators were displaced by political party politicians. These object goals of 1818 are still crucially important to our Republic. One should not be misled into thinking there is any significant distinction between high school and 'Higher Ed' (junior college, college, and graduate school) in regard to these object goals merely because the distinction between 'secondary' and 'higher' education was not a distinction made in Jefferson's day. The *Personfähigkeit* to be a private businessman, a public officer of government, or a citizen is not a power that must be made to require a college diploma, nor is it conferred by one.

With the coming of the later distinction between high school and college also came a divorce between the object goals and curricula and topics. Curricular subject matters typically covered in American 19th century high schools varied little after the Civil War from what was common practice in 1857 as exemplified by, e.g., high schools in Chicago (Table 2). As Table 2 illustrates, by then a beginning of curricular differentiation in high school had developed with separate departments being established for terminal students (the English Department), college-bound students (the Classical Department), and future teachers (the Normal Department).

One thing particularly important to note is: the object-goals-oriented curricula and topics are oriented toward the general learner, not for the professional specialist. Topics like "science," for instance, can be taught with either of two emphases. First, its general ideas, principles, and, most importantly, *what it does and does not do* can be taught to everyone. This is the topical education

**Table 2**  
19<sup>th</sup> Century High School Curricular Subject-Matters

<u>General Subject-Matters</u>			
1. reviews of preparatory studies	9. mensuration	17. natural philosophy	25. moral studies
2. physical geography	10. surveying	18. chemistry	26. etymology
3. history	11. navigation	19. geology and minerology	27. English literature
4. ancient geography	12. elementary bookkeeping	20. rhetoric	28. Hillard's First Class Reader
5. arithmetic	13. botany	21. logic	29. drawing
6. algebra	14. astronomy	22. political economy	30. vocal music
7. Davie's Legendre	15. higher astronomy	23. principles of government	31. German or French
8. plane and spherical trigonometry	16. physiology	24. mental philosophy	32. recitations and compositions
Classical Department	English Department	Normal Department	
from general subject-matter list: 1-7,14, 16-17, 26, 28, 30, 32 additional subject-matters: Latin grammars; first and second Latin lessons; Latin prose composition, Andrew's Caesar; Johnson's Cicero; Bowen's Virgil; Andrew's Latin Lexicon; Anthon's Classical Dictionary; Crosby's Greek Grammar; Crosby's Greek Lessons; Arnold's Greek Prose Composition; Felton's Greek Reader; Boise's Xenophon Anabasis; Owen's Homer's Iliad; Liddell and Scott's Greek Lexicon	all general subject-matter topics	from general subject-matter list: 1-7, 12-14, 16-20, 23-30, 32 additional subject-matters: theory and practice of teaching; German and French (both optional)	

source: Barnard (1857), pp. 535-536

citizens of a Republic need in order to be able to carry out their Sovereign Duties of self government because those Duties require citizens to evaluate and judge proposed laws and allocations of public wealth, regulations to be placed on commercial enterprises, and other matters pertinent to the general welfare of the public. Teacher education must prepare teachers to teach it.

This educational orientation also arms citizens against the possibility that some special interest group will try to exploit public ignorance in order to further their own private agenda by means of misleading propaganda. It is an unfortunate historical fact that such propaganda is frequent. The more complex technologies become and the more they affect everyday life, the more likely and frequent special interest propagandizing becomes. In all cases these attempts are deontological crimes and it is important for citizens to be able to discern them and require the government to deal with the perpetrators. The simple fact is that when political or company spokesmen try to "spin" some occurrence so that it appears in a light favorable to their interests, that is propaganda and in many cases it is misleading propaganda. To put it as a child might, such spokesmen are lying to you by omission of pertinent facts. It is why when court witnesses are sworn in the oath they take is to "tell the truth, *the whole truth*, and nothing but the truth."

Second, science (and, likewise, every other topic) can be taught with an orientation toward professional specialists. This orientation tilts strongly toward private rather than public interests. It also directly leads to legitimate debate on the question of whether or not specialist training should be a matter for strictly private education. Here there are three possibilities: (i) there is a sufficient *public* interest served by having a labor pool of specialists (e.g., chemists, engineers, lawyers, medical doctors, carpenters, barbers, *etc.*) to justify expenditure of public wealth assets to ensure that labor supply; (ii) the public interest is not sufficient to justify expenditure of public wealth assets to provide such training; and (iii) there is a public interest but only to such an extent that private funding with some amount of public subsidy is the most justifiable choice. This is a judgment and decision that must be made in every case of specialized training.

Upon such considerations hinge choices between public, private, or semi-public/semi-private institution. To make such a determination requires that the citizenry be sufficiently knowledgeable in the matter to make well-formed judgments weighing the pros and cons of proposals placed before public consideration and that of their representatives. That requires an adequate labor pool of skilled teachers who understand the Idea of the American Republic, and this requirement justifies an institution of public instructional teacher education. The Republic can get by without professional politicians; it cannot survive without well-trained public school teachers.

Teachers are charged with the Duty and expectation of transforming educational object goals into educational practice through design of and instruction in topical courses and curricula. To fulfill this Duty, the teachers must themselves be topically educated to a degree greater than is needed by non-teachers. As I said earlier, a teacher who cannot read cannot teach reading. A teacher who is ignorant of social-natural economics cannot teach a learner "the information he needs for the transaction of his own business." A teacher who is ignorant of statistics cannot teach a learner how to spot common deceits propagandists employ in lying with statistics. A teacher who is ignorant of social-natural political science cannot "form the statesmen, legislators and judges, on whom public prosperity and individual happiness are so much to depend." Need I say that all of these cultivations begin *when children begin attending school* because later practical maxims and concept structures are *always* built upon the foundations of a person's earlier ones?

Many of the most objectionable features of what PEM reformers came to call "child centered education" arise from the divorce of object goals and topical subject matters. Mirel remarked,

[John Dewey] argued that changing the nature of curricula was central to improving the quality of teaching and, by implication, teacher education. Dewey was emphatic that pupils *should* learn discipline-based content, but he urged educators to recognize that, for the most

part, such content was structured around questions and research that were meaningful to experts in various academic disciplines, not to children. As he explained, "Textbook and teachers vie with each other in presenting to the child subject-matter as it stands to the specialist. . . . The material is not translated into life-terms." By lamenting the lack of "life-terms," Dewey was arguing for discipline-based curricula to be reframed in ways that connect "with what the child has already seen and felt and loved." [Mirel (2011), pg. 8]

"Life terms" is arguably too vague. "Practical meanings" would have gotten Dewey's point across with far more accuracy and far less likelihood of misinterpretation. This is the sort of presentation of topics that is oriented in the first direction I spoke of above. Furthermore, "what the child has already seen and felt and loved" is not restricted to experiences a child has had at home. There are numerous experiences that can easily be first presented to a child with simple experiments that evoke a sense of wonder prior to presenting him with information one of Veysey's disciplinary researchers would see as "the important" abstractions of his discipline. Have you ever poured a large amount of table salt into a glass of beer? I think I can safely guarantee this is a simple demonstration that would humorously attract the curiosity and interest of a typical twelve-year-old to "the wonders of chemistry." But to even think of doing (or having a child do) an empirical demonstration like this, the teacher has to know something about the details of chemistry. Topics without subject matter are empty; subject matters without topics are meaningless.

#### § 4. Teaching Subject Matters by Topical Exposition

A topic is an Object in which a manifold of subject matters is made to be *unified*. It is a *defined* Object that serves as a mathematical schema for organizing its subject matters. Contained in the definition of any topic is a principle of a disciplined whole of the knowledge of its subject matters and this principle is what makes a topic systematic. Indeed, the idea of a *non-systematic* topic is in many ways self-contradictory. Subject matters in a course taught as a non-systematic collection of concepts often are not carried forward by a learner from that course to others. This is a primary weakness of 'survey courses.' What usually happens instead is a behavior I like to call the Etch A Sketch<sup>®</sup> effect: at the end of the term the learner metaphorically gives his head a good shake to erase what transpired in a course he has just finished. Ontology-centered presuppositions about what a topic is tend to lead to non-systematic treatment of subject matters, and such a treatment seems likely to lead to the Etch A Sketch<sup>®</sup> effect<sup>2</sup>. Topics, as schemata of knowledge, require epistemology-centered design considerations for teaching learners about them.

To a learner, subject matters appear as discrete objects without *a priori* connections of one to another. For him to *make* such a connection, the instruction provided to him must expose the *principle* of the topic's disciplined whole. Without such a *practical* exposition, the subject matters of history are just a parade of disjoint factoids, the subject matters of mathematics are just a

---

<sup>2</sup> The Etch A Sketch<sup>®</sup> effect is a very interesting phenomenon for which there has not yet been sufficient empirical characterization carried out to advance understanding beyond the stage of provisional hypotheses and speculations. The phenomenon seems to be linked to the more general phenomenon of forgetfulness as a special case. At the present state of characterization, it seems more likely than not that the underlying causative dynamics of its mental physics are linked to the nature of the practical meaning implications the learner gives his concepts. I speculate that these are such that they are connected only to practical maxims of prudence and the learner does not establish presentative schemes for tying the object concept in with other concepts-of-context sufficiently to give it *application* significance for the learner. I suspect he merely Self-presents the object as something with which its expedience is tied to feelings of *Unlust* and type- $\alpha$  compensations. For instance, the learner's interest might extend no further than simply "passing the course" and "shaking its dust from his feet" without regard for any possibility he might later discover interesting uses for the subject matter. Things I've heard students say are consistent with this postulate. But, as I said, the Etch A Sketch<sup>®</sup> effect is still in a speculative stage of investigation.

parade of tricks to be memorized and regurgitated, the subject matters of a science are semi-religiously viewed curiosities, and the themes and plots of creative literature and poetry are just so many anecdotal accidents of no particular importance to the learner.

American curricula at all levels of schooling have historically been course-centric, by which I mean curricula are defined by sequences of courses purportedly about specific topics. The courses typically consist of some parade of facts that specialists claim to be included in or to constitute a *de facto* definition of the topic. The silo granulation that typifies the occupational specializations of college professors is built into the structure of curricula as if primary and secondary schooling was some sort of recruiting venue where different types of academic niches compete to attract the future occupational interests of pupils. This attitude is so deeply engrained in habitual thinking that this approach to education is never even questioned. Dewey's criticism that "such content is structured around questions and research that are meaningful to experts in various academic disciplines but not to children" has never been addressed by *any* of the diverse education reforms over the past century, including those of the Progressive Education Movement and every so-called "reform" that has been tried in the past four decades.

I am inclined to think "experts" in various academic disciplines do not in fact understand what their own disciplines are all about if *the discipline* is something different from *the jobs* that "experts" occupy themselves with doing. In some cases job-labor and academic-discipline are very closely identified. Any of the diverse specialty branches of engineering, the practice of law or of medicine, and specialized scientific research occupations are fair examples of this. In other cases – "social studies" and "mathematics" for instance – there is little or no immediate job-to-discipline connection for people whose future occupations are other than "college professor."

Experts *in* their fields they are, but the people to whom educologists traditionally turn to get definitions of topics and courses cannot truthfully be called experts *of* their fields in the great majority of cases. The nature of being a specialist includes a natural tendency to develop habits of straitjacketed thinking that William James described as "the habits of the shop." James wrote,

Already at the age of twenty-five you see the professional mannerisms settling down on the young commercial traveler, on the young doctor, on the young minister, on the young counselor-at-law. You see the little lines of cleavage running through the character, the tricks of thought, the prejudices, the ways of the 'shop,' in a word, from which the man can by-and-by no more escape than his coat sleeve can suddenly fall into a new fold. [James (1890), vol. I, pg. 121]

One of the authors of *The Mathematical Experience* candidly wrote,

Up till about five years ago, I was a normal mathematician. I didn't do risky and unorthodox things, like writing a book such as this. I had my "field" – partial differential equations – and I stayed in it. My serious thinking, my real intellectual life, used categories and evaluative modes that I had absorbed years before, in my training as a graduate student. Because I did not stray far from these modes and categories, I was only dimly conscious of them. They were part of the way I saw the world, not part of the world I was looking at. . . .

The fact is, though, that I have come to a point where my wonderment and fascination with the meaning and purpose, if any, of this strange activity we call mathematics is equal to, and sometimes stronger than, my fascination with actually *doing* mathematics. . . . I trace its beginnings to the day when I came at last to teach a course called Foundations of Mathematics. . . . I hoped that by teaching the course I would have the opportunity to read and study about the foundations of mathematics, and ultimately to clarify my own views of those parts which were controversial. . . . Since my interest in the foundations was philosophical rather than technical, I tried to plan the course so that it could be attended by interested students with no special requirements or prerequisites; in particular, I hoped to

attract philosophy students and mathematics education students. . . .

In standing before a mixed class of mathematics, education, and philosophy students to lecture on the foundations of mathematics, I found myself in a new and strange situation. I had been teaching mathematics for some 15 years, at all levels and in many different topics, but in all my other courses the job was not to talk about mathematics, it was to *do* it. Here my purpose was not to do it but to talk about it. It was different and frightening. . . .

In opening my course on the foundations of mathematics, I formulated the questions which I believed were central, and which I hoped we could answer or at least clarify by the end of the semester. . . . As I formulated these questions, I realized that I did not know the answers. . . . But what bothered me was that I didn't know what my own opinion [about the answers to these questions] was. . . . I started to talk to other mathematicians about proof, knowledge, and reality in mathematics and I found that my situation was typical. [Davis & Hersh (1981), pp. 1-4]

I have rarely encountered such refreshing candor among professional specialists. I have many professional colleagues who work in the field of computer science; none of them have ever been able to tell me what computer science is. I have many professional colleagues who work in the field of electrical engineering; none of them have ever been able to tell me what electrical engineering is. I have many professional colleagues who work in the fields of computer design or information technology; none of them have ever been able to tell me what "computing" means in general. I find the story is the same in specialty discipline after specialty discipline. The guy who takes care of my lawn has a better handle on what "lawn care" is and the guy who services my car has a better handle on what "auto mechanics" is than my professional colleagues in the philosophy department have on what "philosophy" is. Former American League umpire Ron Luciano once said, "The world of athletics is heavily insulated from reality." So too, I think, are the divers worlds of the specialized academic disciplines.

Ask an academic specialist what his field is and you will usually get descriptions or expositions of what sorts of activities typify what the specialist and his professional colleagues do, but you will probably not get a definition. If you do get one, it will likely be one quoted from a specialty dictionary (e.g. the Penguin Dictionary of Biology); ask what that definition *means* and you will be back to descriptions or expositions that are "part of the way I saw the world, not part of the world I was looking at." *Where is the principle of the unity of the topic in this?*

You do not know what a topic is if you don't know its principle. So, are "the experts" really the right people to rely on for deciding how to make a curriculum, a topic, or a course for public instructional education? Are educators wise to submissively accept an "expert's" word on these matters as "the last word"? Are we wise when we ignore the lessons of Socrates? No, no, and no.

The purpose justifying institution of *public* instructional education is not to prepare pupils to be trained as professional mathematicians, professional historians, professional engineers, or even professional lawn care specialists. It is to cultivate and improve the corporate *Personfähigkeit* of a Republican Society by cultivating and expanding the *Personfähigkeit* of each learner so that each is adequately prepared to *be* a citizen capable of living up to the expectation of authority that goes with *being* a sovereign citizen. What makes up the knowledge and skills needed to accomplish this is what is to be set out in object oriented goals of instructional education.

Topics must be made to answer to stated object oriented goals of instructional education. But to what is subject matter instruction made answerable? Upon this answer the design of lesson objects hinges. Let us not try to leap to an abstract answer right away. It is better to proceed by means of a topic-by-topic search for their *principles*, trusting that a general answer, if there is one, is to be found by abstraction from particulars found by expositions of particular topics. This tactic is true to the *dictum* that all human beings learn from the particular to the general. What we

seek to find by means of this exposition tactic might be called *the practical essence of topical instruction*. To do this, though, we need some initial empirical ideas of what our topics might be.

## § 5. A Starting Point for Topical Exposition

Although I have just said some uncomplimentary things critical of current American curricula design, it also has to be acknowledged that the present institution did not come into being as a result of having the inmates run the asylum. The people whose good faith efforts led to the present institution are not stupid and they do genuinely have what they think is best for the learners and for the country in mind when they make the institution. Contained within the outcomes of their efforts are concepts and conclusions in which a significant degree of truth and practical fecundity should be expected to be found. It would be foolish and shortsighted to ignore their efforts or fail to make use of them to help identify important and justifiable topics and subject matters. Let us therefore try to obtain an adequate overview of and perspective on these outcomes to use as the jumping off point for the expositions that follow.

There is no such thing in the American institution of public education as "the" curriculum used at every school. All curricula differ in detail from one school to another and, as I said earlier, it is fit that it be so. Nonetheless, there are also a great many common factors shared by the divers curricula. This is not surprising. In the first place, all human beings are more alike to one another than they are different, and this natural commonality acts as a partial cause of commonality found in curricula. In the second place, all public schools are inspected and evaluated by accrediting agencies of one type or another and accreditation enforces a significant amount of standardization. Common factors imply it is not necessary to examine every curriculum at every school. Obtaining an overall perspective can be accomplished by looking at a few samples. The ones used here seem to me to make a good representative sample descriptive enough of the nation overall.

### § 5.1 The Common Core State Standards Initiative (CCSSI)

One contributing factor to why such a thing as "representative sample" can be found at all is due to the latest reform movement to gather momentum in the U.S. This is the Common Core State Standards Initiative ([www.corestandards.org](http://www.corestandards.org)). The initiative has, at the date of this writing, been adopted by 43 of the 50 states and vigorous effects have been and still are underway at state and district levels to "transform" local curricula to "align" with the standards. It is important to understand what this initiative is and is not. One thing it is *not* is a common core curriculum. This is despite the fact that politicians, propagandists, and members of the public often call it by this label. If it is not a common core curriculum, what is it and how is it related to curricula?

Generally speaking, state common core frameworks could properly be called "meta-curricula." State departments of education lay out general "areas" describing "content" that local schools are then required to provide in their curricula. It is usually the case that each "content area" (or "area of study" or some other locally peculiar label) is constituted by several specific local courses. The CCSSI reforms dictate, at the state level, various "rubrics and metrics" and/or other general descriptions for assessing outcomes in terms of abilities pupils and students are expected to be able to demonstrate. In many cases educational material (e.g. textbooks) are either dictated by the state or else local school districts are expected to publish the specific materials they use in their curricula. Statewide standardized tests, defined state by state, are also often made a part of the states' individual education reforms. There are some potential benefits to the reforms *if* they are implemented according to sound social-natural scientific principles, and there are some very serious flaws in the reforms as they are currently progressing.

The Common Core movement had its start in the first decade of this century. Cohen discussed a number of "difficulties" and "issues" involved in the divers on-going controversies over public



education. These included assessment of teaching, assessment of pupil and student learning, teacher education, and academic standards. Following this discussion he wrote,

The Common Core State Standards Initiative (see [www.corestandards.org](http://www.corestandards.org)) could help chart a way out of these difficulties. To date it has focused on academic standards and tests, but at least some of the founding ideas saw standards as a first step in a process of building several elements of educational infrastructure, including aligned assessments, tests, and perhaps curriculum or curriculum frameworks. . . . It remains to be seen whether the assessments will be well designed and how well they will be tied to the standards. "Alignment" has become a standard bit of education jargon since 1994, when both the Goals 2000: Educate America Act and the Improving America's Schools Act were signed into law, but it has been little explored. I have found, for instance, no criteria with which to judge the quality and extent of alignment between tests and standards. It also remains to be seen whether a curriculum or curriculum frameworks will be devised, and if devised, how well aligned they will be with assessments and standards. Even if all these things are accomplished, it remains to be seen whether publishers will produce quality materials that are tied closely to curriculum frameworks. And if all these steps were taken, there would remain the last and largest problem: how can we enable those who teach and intend to teach to learn to use these educational resources to good effect, and how can we build systems of teacher education to enable that learning? [Cohen (2010-11), pg. 54]

One thing you should notice here is that the focus of the movement is *not* the education of human beings. It is how to control and assess what schools are doing. *This is vintage Taylorism* and Taylorism is *the fatal flaw* in this reform, just as it was in the PEM reforms. It is being presumed that cultivation of learner *Personfähigkeit* will happen automatically if Taylorite controls are put into effect. Here we have an example of James' "shop thinking." The presupposition is simply not true and in this reform movement we are seeing 20th century history repeat itself.

Since Cohen wrote these words, "curriculum frameworks" have been added to the standards, tests, "rubrics and metrics," and other Taylorite trappings of the semblance of education reform. These have been put together state by state but, despite the nominal independence of their developments, I find a great deal more commonality than difference among diverse state documents. One possible reason for this could of course be that educologists have hit upon some key principle of social-natural education science and therefore the different states are designing to a common objectively valid basis. However, this isn't the case and a more likely explanation for the observable commonality is simple mimesis – which is another Taylorite characteristic of this sort of centralized administration and management. When a Taylorite doesn't know what to do he copies what someone else is doing, or what he reads in a magazine or a journal article, and calls it "best practices." The same thing usually happens in large private sector corporations as well. Robert Townsend, the CEO who led Avis Rent-A-Car to profitability for the first time, wrote,

The National Industrial Conference Board is a sophisticated center of research on yesterday. A nonprofit organization, it is paid by its member business organizations according to size or profit. Any conventional company can join. NICB publishes all sorts of data about corporate practices. I've found it a valuable source for ideas – on what not to do. When the vast majority of big companies are in agreement on some practice or policy, you can be fairly certain it's out of date. Ask yourself: "What's the opposite of this conventional wisdom?" And then work back to what makes sense. [Townsend (1970), pg. 20]

The preponderance of evidence is that standardized tests have no predictive value and do not measure people's abilities, potentials, or skills. Assessment standards, and the "rubrics and metrics" that operationally define them, are *not* scientifically deduced methods of measuring abilities or skills. First, they are designed to make it merely *seem* possible to quantify something that is unquantifiable. They are selected according to a consensus of some group of alleged

experts. This consensus should be seen for what it is: nothing else than agreement on a subjective judgment of taste, i.e., for what 'feels' like it ought to be relevant or pertinent in the opinion of the standards-makers. There is no objectively valid ground to be found for this judgment.

Second, they are designed to make it possible to require the standardized reports and forms by which Taylorism's centralization of power structure can *compel* obedience to a master plan. In the case of education, ownership of this master plan is centralized at and dictated from the state level. The assessment descriptions use soft, vague phrases of the sort everyone thinks he understands but which are in fact subjective, unpredictable, not grounded in any way with either educational Self-development or real goals of public instructional education, and which, upon closer examination, do not have common agreement over what they really mean. Enforcement of the standards is by compelling the compliance of the agents of the institution, and this is invariably based on implied threats of punitive measures to be taken against non-compliers.

Formalized standards and procedures are never adequate substitutes for human judgment and experience. Faith in them is the worst sort of Platonic idolatry. About the best thing that can be said for this Taylorite management approach is that it is usually easy for the agents to subvert it. Taylorites by and large don't pay attention to what is actually going on in their organizations. They pay attention to whether or not the reports and forms they require their underlings to turn in *are* filled out and turned in. Often there are so many of these forms and reports that they do not or cannot even *read* most of them. Often a Taylorite doesn't read *any* of them. The single redeeming feature of Taylorism is that its thorough-going incompetence can often be neutralized by agents who present a semblance of compliance (turn in the forms) and practice Dickens' advice to

Let sleeping dogs lie – who wants to rouse 'em? [Dickens (1850), chap. 39, pg. 473]

When I was the program director of one of the academic programs at my university, I had no trouble appeasing the Taylorism monster's maw with paperwork while the program's faculty got on with the job of providing effective instruction to our students – a task that had nothing whatever to do with the "rubrics and metrics" of the forms I had to file once a year. These were always derived from other "standard" Taylorite assessment toys, which meant the wording was, by standardization, soft, vague, and subjective enough that half our laboratories could have burned to the ground and I would have still been able to legitimately claim we were in compliance with the standards.

My point here is this: When requirements are imposed that people doing the productive work know to be useless or non-pertinent to the real task, and imposed with an implied threat of punitive sanctions to back them up, people *will* take whatever steps seem best to them *to neutralize the threat*. Yes, this *is* insubordination – but only if you're caught. If you're not, it is "standard operating procedure." The threat provokes acting from maxims of prudence grounded in basic Duties-to-Self. In psychology this sort of behavior falls under the category of "passive aggression" carried out by people subjugated by Taylorite rulers. A sufficient number of passive aggressors are always around to render Taylorite assessment controls useless, toothless, and meaningless. The controls exist to support Taylorism, not to accomplish the institution's purposes.

To those idealistic folks who are aghast at this blunt statement because it seems so antisocial, my reply is: a Taylorism social environment *is* antisocial *inherently* (monarchy/oligarchy governance); there is *no* Community under rulership; *no* social contract between rulers and ruled exists to be broken; and for that reason *no* deontologically valid Obligation or Duty is owed by the ruled to the rulers. The defensive actions are socially *amoral*, not *immoral*, because any Society under Taylorism has no *real* social-natural basis for common moral conventions. Taylorism rulership *disintegrates* a Society. It never preserves or grows or unites it.

The curriculum frameworks that have evolved and are evolving at present do have an analysis

value inasmuch as they name "content areas" that in one form or another have been part of American public education for three centuries. The first Puritan schools in New England were set up with instruction requirements [Cubberley (1919)]. The Knox Plan [Knox (1797; 1798)] and the Smith Plan [Smith (1797)] each contained lists of "courses" to be taught at Institutes of public instruction. The "content areas" set out in the Common Core State Standards include many of the same ones.

This doesn't mean these areas in their traditional formulations are synonymous with topic and subject matter. They aren't. But it is still prudent to pay attention to the conventional categories they abstractly delineate because it is unlikely these would have been persistently used for three centuries if they were entirely empty of useful ideas and contents. The categories are useful *as a starting point* for empirical social-natural topic development.

**§ 5.2 Representative Elementary School Curricular Frameworks**

After surveying website data from many districts across the United States, I have selected four school districts I see as typical representatives. They are taken from four states that are moving to implement Common Core reforms. Both large and small urban population areas are represented, as are different relative levels of district wealth (ranging from a very cash-strapped district to districts that seem to have relatively well financed schools). Data on content areas was obtained from their websites. These websites were complete enough to follow the frameworks from kindergarten through high school, providing a complete look at them as integrated systems of instruction. This data completeness was one of the factors in selecting these as representative districts. Table 3 summarizes curricular content areas for their elementary schools.

Local courses differ in all four locations, as does local labeling terminology for the tabulated content areas. The table also clearly shows that different districts have different ways of labeling at least some of these areas. Nonetheless, closer examination of each one of these districts reveals that the differences are not as much as Table 3 might seem to suggest. For instance, some districts distinguish "health" from "physical education"; others put both under the same content area label.

**Table 3**  
Examples of Elementary School Curricula

Sunnyvale School District Sunnyvale, CA 'Areas of Study'	Carroll County Public Schools Westminster, MD 'Subject Areas'	Kuna School District Kuna, ID 'Content Areas'	Princeton Public Schools Princeton, NJ 'Subject Areas'
English	Integrated Language Arts	Language Arts	Language Arts
Mathematics	Mathematics	Reading	World Languages
Social Sciences	Social Studies	Mathematics	Mathematics
Health	Health	Social Studies	Social Studies
Science	Science	Science	Health
Visual and Performing Arts	Fine Arts	Music	Science
	Physical Education	Physical Education	Art
	STEM		Physical Education
			Music

Website sources: [www.sesd.org](http://www.sesd.org); [www.carrollk12.org](http://www.carrollk12.org); [www.kunaschools.org](http://www.kunaschools.org); [curriculum.princetonk12.org](http://curriculum.princetonk12.org)

**Table 4**  
**Examples of Middle School Curricula**

Sunnyvale School District Sunnyvale, CA 'Areas of Study'	Carroll County Public Schools Westminster, MD 'Subject Areas'	Kuna Middle School Kuna, ID 'Content Areas'	Princeton Public Schools Princeton, NJ 'Subject Areas'
English Language Arts	Integrated Language Arts	Language Arts	Language Arts
English Language Development	Family & Consumer Science	Spanish (elective)	World Languages
Mathematics	Mathematics	Mathematics	Mathematics
Social Sciences	Social Studies	History	Social Studies
Wellness	Health	Health	Health
Science	Science	Science	Science
Arts	Fine Arts	Art (elective)	Art
	Physical Education	Physical Education	Physical Education
	STEM	Music (electives)	Music
	Technology Education	Industrial Arts (elective)	

Website sources: [www.sesd.org](http://www.sesd.org); [www.carrollk12.org](http://www.carrollk12.org); [www.kunaschools.org](http://www.kunaschools.org); [curriculum.princetonk12.org](http://curriculum.princetonk12.org)

At least to the level of abstraction presented by the framework categories, all but eight of the 44 states participating in the Common Core State Standards Initiative reform go beyond the limitation of the scope of the CCSSI (which is restricted to language arts and mathematics) and report framework categories nearly identical to those covered in table 3. There does appear to be broad agreement within the educology establishment of the U.S. on at least these categories. In the eight states that appear to be uncommon, I was unable to find sufficiently clear information on their websites to draw a defensible conclusion about what these states purport to be doing.

At the elementary school level the curricular focus is placed on foundational instruction and the "how-to mechanics" of, e.g., reading, writing, doing arithmetic, etc. This is appropriate for preoperational children (grades K-2) but at least somewhat questionable for children at the stage of concrete operations (grades 3-6). Those children are developmentally at a stage where their ability to conceptualize presentative schemes implies "when to" and "why to" concepts that augment concrete "how to" concepts should begin to enter into instruction as a preliminary to later instruction that teaches them, e.g., what mathematics is (rather than just how to do math) or what science is and how science does and does not pertain to everyday life. The difference in developmental stage for children ages 8 to approximately 11 makes it appropriate to treat grades 3-6 more like a kind of pre-middle schooling – i.e. that a logical division into primary, pre-middle school, middle school and high school is likely to be one that is better matched to the educational Self-development abilities of children and young adults.

### § 5.3 Representative Middle School Curricular Frameworks

At the elementary school level the representative districts do not exhibit evidence of having differentiated curricula or tracking. At the middle school level (table 4) evidence of this is visible in the content areas. When one examines the course offerings in these districts one finds that all of them have differentiated curricula in *at least* mathematics and science. All the districts' web sites seem to me to take care to *not highlight* this curriculum differentiation. So far as I have been

able to tell from the published information, any "tracking" of pupils that might be occurring seems to be at the volition of the learners and their parents (self-tracking) rather than from institutionalized tests or population group stereotyping. However, tracking might be present in the 'guidance counselor' functions of the districts or social pressures in the local communities. There is no way to tell from the websites if this is so or not. If it is so, it is a sign of social caste bigotry.

Courses dedicated to specific job skills do appear at the middle school level but there is no evidence in the presented information of integrated *capital skills* instruction. All the districts do appear to offer some "career instruction" coursework common to all pupils but in all cases these offerings appear to be very minimal, brief, and seem to be quickly followed by differentiated non-college (occupational) tracks vs. college prep course tracks. It appears that this undesirable PEM-reform legacy *is* being maintained at the school district level in the middle schools.

Middle school curricular information appearing on most web sites appears to be more sketchy and exhibit less evidence of any new thinking than seems to be given to elementary and high school level curricula. I am left with an impression that, on the whole, middle school instruction is getting less attention than the other two schooling divisions. Because the typical middle school years cover ages 12-14 (the formal operations stage of mental development) this must be regarded as an error of omission in the present reforms if my impression of curricular neglect is correct. This is precisely the age range where desirable concepts of citizenship and *mos maiorum*, as well as establishing habits of non-rote mathematical and scientific thinking, become possible. If the formation of root habits of thinking in these areas is neglected at this stage, then by the time the learner reaches the high school grade levels he will meet the topics presented there with habits of thinking that have developed by accidents of experience rather than purposive instruction.

**§ 5.4 Representative High School Curricular Frameworks**

The common general themes exhibited by the elementary and middle school frameworks are in evidence again in representative high school graduation requirements (table 5). The integrity of

**Table 5**  
Examples of High School Graduation Requirements

Fremont Union High School District Sunnyvale, CA "A-G Requirements"	Carroll County Public Schools Westminster, MD 'Graduation Requirements'	Kuna High School Kuna, ID 'Graduation Requirements'	Princeton High School Princeton, NJ 'Course Requirements'
English	English	Language Arts (including Speech)	Language Arts Literacy
World Languages (optional)	Mathematics	Mathematics	World Languages
Mathematics	Science	Natural Science	Mathematics
History	Social Studies	Social Science (Government, U.S. History, Economics)	World History & Culture
Science	Health	Humanities (Visual & Performing Arts, Foreign Language)	American History
Visual and Performing Arts	Fine Arts	Health	Science
Electives	Physical Education	Physical Education	Visual and Performing Arts
	World Languages or Sign Language or Technology	Senior Project	Physical Education, Health & Drivers Education
		Electives	Financial, Economic, Business & Entrepreneurial Literacy
			Practical Arts

Website sources: [www.fhs.fuhisd.org](http://www.fhs.fuhisd.org); [www.carrollk12.org](http://www.carrollk12.org); [www.kunaschools.org](http://www.kunaschools.org); [curriculum.princetonk12.org](http://curriculum.princetonk12.org)

framework themes across the entire span of K-12 schooling does demonstrate purposiveness in the organization and structure of U.S. institutions of K-12 public instructional education. What I mean by this is that there are definite integrated progressions from the first to the last grades of K-12 public schooling. At the abstract level of curricular frameworks, instruction at each grade level can be seen as intending to prepare the learners for the next level, culminating in the graduation requirements shown in table 5, in congruence with the curricular principle explained in §1.

The differentiated curriculum begun in middle school appears even more clearly at the high school level. Examination of the diverse high school course offerings, credit requirements, and assessment standards I have found on the district websites demonstrates differentiation is carried on and further specialized in high school. This differentiation seems to be most pronounced in mathematics, physical-natural sciences and the humanities. It appears to be least pronounced in the language arts, social science, and health/physical education course offerings. The separation of educational tracks begun in middle school widens during high school along lines of a job-caste focus that segregates learners preparing for continuing education at four-year baccalaureate Institutes from those who will either directly enter the workforce or to do so after additional two-year training at a trade school or a junior college. As happened before in the 1950s and '60s, educologists are perpetuating this PEM legacy of unequal opportunity and social caste bigotry [Wells (2013), chap. 15, pp. 547-548, 579-580]. It is a perpetuation of institutionalized injustice.

This appears to mean that much of the thinking about curriculum development is still rooted in the old orientation toward job skills rather than one which emphasizes the cultivation of *capital* skills that empower individuals to deal with shifting socio-economic conditions the future must always be expected to bring. Such an orientation in educology quite naturally brings with it precisely the sort of narrow, siloed education institution Hutchins quite correctly criticized:

We are all specialists now. Even early in high school we are told that we must begin to think how we are going to earn a living, and the prerequisites that prepare us for that activity become more and more the ingredients of our educational diet. . . . What is missing is education to be human beings, education for our responsibilities as members of a democratic society, education for freedom. . . . [This] is the education that prepares us to be free men. You have to have this education if you are going to be happy; for happiness consists in making the most of yourself. You have to have this education if you are going to be a member of the community; for membership in the community implies the ability to communicate with others. You have to have this education if you are going to be an effective citizen of a democracy; for citizenship requires that you understand the world in which you live and that you do not leave your duties to be performed by others, living vicariously and vacuously on their virtue and intelligence. To be free you have to be educated for freedom. . . . It means that you have to think, for example, about the aims of life and of organized society. [Hutchins (1959), pp. v-vi]

The *framework* themes evidenced in tables 3-5 are not contrary to the possibility of cultivating the sort of liberal education Hutchins favored *without* hindering the simultaneous cultivation of capital skills. Indeed, *public* instructional education *must* cultivate both or lose its justification in the social contract. The problem does not lie with the framework themes; it lies with the subject matters of instruction that are made to be associated with those themes.

## § 6. Synopsis of this Survey

The actual *Existenz* of integrated framework themes demonstrated in the last section provides strong empirical evidence of a general, albeit vague, agreement among members of the U.S. educology establishment and broader public opinion. The agreement is that these framework themes are the proper themes (in the abstract) that are of importance so far as topic and subject



matter definitions are concerned in public instructional education. There may be – and there are – disagreements at more detailed levels but at least the more or less common framework provides an empirically promising starting point for a scientific development of topics and subject matters.

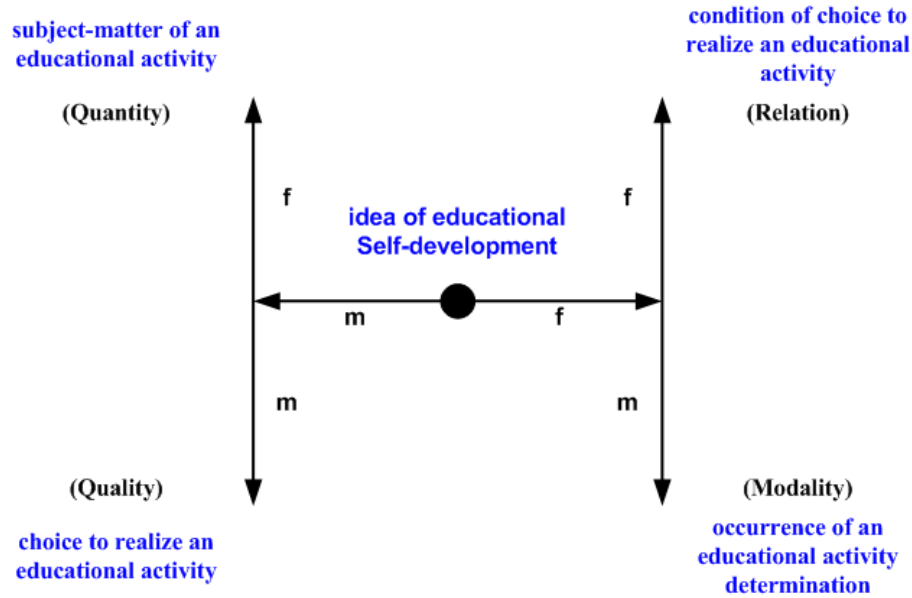
Comparing the framework themes across the representative school districts and up the ladder of school grade levels, the following logical framework divisions can be identified:

1. Language Arts
2. Mathematics
3. Physical-natural Science
4. Social Studies (social sciences and some of the humanities)
5. Aesthetical Arts (partly comprised of the rest of the humanities and partly comprised of commercial arts)
6. Health and Physical Education

Absent from this common list but present in some district plans is a seventh area I call *capital skills/wealth acumen*. This area is hinted at by the 'technology' elective placeholder in the Carroll County graduation requirements, the Princeton High School 'financial, economic, business, and entrepreneurial literacy' graduation requirement, the STEM (Science, Technology, Engineering, and Math), 'family & consumer science,' and 'technology education' subject areas of the Carroll County Middle School, and the 'industrial arts' elective in the Kuna Middle School.

Dividing public instructional education into these seven logical categories is a starting point. The remaining chapters of this treatise are concerned with arriving at an understanding of what these categories *mean* in the context of social contract justification of public education. As I said earlier, these categories are not radically new in and of themselves. Similar labels for similar areas appear in curricula going all the way back to the first Puritan public schools in colonial New England. Empirically, the fact that they are *not* new indicates that they contain something in their ideas that is fundamental to life in Western Societies. However, the fact they are not new also promotes a satisficing tendency to take them for granted. By this I mean they are used as labels but neither distinctly explained nor defined – not by any state standards and not by any educology theory taught in today's colleges of education. That vagueness cannot be allowed to stand. A good deal of the content in the remaining chapters is devoted to clarifying the social-natural meaning implications for these seven areas. These meaning implications carry fundamental significances for topic and subject matter design and selection as well as for developing educational materials.

The Common Core documents and the state standards that have been and are being developed do not address this issue of "what are these things?" Those documents provide nothing but guidelines and standards for Taylorite "assessment" of the activities and results of schooling activities. Conspicuously absent from all of these standards is any connection to the self-determination power of the learner as a human being or any connection to factors that motivate human beings to undertake educational Self-development. I will repeat something I said earlier: it is not possible for a teacher to "learn his pupil some math." *Teaching is cultivation of learner educational Self-development*. The only person who can determine if the phenomenon of learning will happen, and what will be learned if it does happen, *is the learner himself*. The standards do *nothing whatever* to ensure desirable educational Self-development will happen, to guide what will be learned if it does happen, or to guarantee that the outcomes of public instructional education will satisfy the general purposes that justify the institution of public instructional education under the social contract. The current reforms, like those of the past, **will not be effective** because they are not designed taking into account the *homo noumenal* nature of people as learners. They are merely toys of Taylorism designed under the premises of Taylorite theories – premises that have, since the 1930s, been conclusively demonstrated and known to be untrue and counterproductive.



**Figure 7:** 2LAR divisions of educational Self-development

The missing factor is the idea of educational Self-development (ESD). This idea was introduced in the first volume of *The Idea of Public Education* [Wells (2012), chap. 1] by means of a series of four questions addressing its Quantity, Quality, Relation, and Modality. This gives the idea of ESD the form of a 2LAR structure illustrated by figure 7. Its defining questions are:

1. If a person chooses to be a learner, what subject matter will he make the object of his educational activity? This is the division of Quantity in educational activity. It pertains ultimately to the interests served by these objects;
2. Will he choose to undertake an educational activity? This question goes to the *homo noumenal* character of a human being as a Self-determining being and it is ultimately grounded in his necessity for achieving a personal state of equilibrium for himself in the presence of disturbance factors. This is the division of Quality in educational Self-development and it pertains to the possibility of teaching;
3. Under what conditions does a learner make a specific choice to realize some specific educational activity? This division pertains to motivational dynamic in his cycle of judgmentation. It is the division of Relation in ESD;
4. What occurrence(s) stand as the *ground* for his choice to undertake or to not undertake a particular educational activity? This is the division of Modality in ESD and pertains to how educational activity serves to satisfy his practical categorical imperative to achieve a state of equilibrium in his personal condition.

An empirical science of *learner-centered* education – that is, a science having for its topic the phenomenon of guided learning by individuals – is a science that by its definition must understand and deal with these four questions. No person can *make* another person learn anything in the particular. You can make a person learn *something* by coercion but what he will learn from the experience is not up to you. That person might well learn that *you* are a person to be loathed and feared, and that what *you* wished him to learn *he* chooses to make an object of the Etch A Sketch<sup>®</sup> behavior I mentioned earlier.

All teaching, if it is to be effective in the connotation that what is taught is also learned and put to use by the learner in service of augmenting his individual *Personfähigkeit*, can be regarded

as a *seduction*. A teacher must *lead* a learner – not to knowledge but to a choice to *acquire* knowledge. There is much truth contained in the old academic joke that "you can lead a student to knowledge but you can't make him think." To teach is to lead and this means that all socially just teaching is a form of *deontological moral leadership*. Taylorism seeks to substitute coercion and rulership in the place of deontological moral leadership and that is one of the major reasons why Taylorism fails.

In the chapters that remain, attention is focused on matters that pertain to subject matters of instruction. The focusing is adjusted for the context of deontological moral leadership, which is the true context for learner-centered education. We do not wish public school pupils and students *merely* to learn; there are specific results our Society demands in exchange for its support of public instructional education. Therefore, subject matter, topic, and curriculum design cannot be about "nothing in particular," as Cohen put it and as the CCSSI reforms now underway still leave it. At most these current reform efforts will mask the fact that old PEM goals and methods are being perpetuated behind a façade of education reform. This cannot be allowed to happen again. The remaining task for this treatise is to understand what the objectively valid topic- and subject-matter particulars are, and to begin to examine what educational material is useful for them.

## § 7. References

- Barnard, Henry (1857), *American Journal of Education*, vol. 3, pp. 531-536, "Public high schools in Chicago," by W.H. Wells, published by F.C. Brownell, 1857; the original is at the New York Public Library and is available as a Google E-book at [book.google.com](http://book.google.com).
- Cohen, David K. (2010-11), "Learning to teach nothing in particular," *American Educator*, vol. 34, no. 4, Winter 2010-2011, pp. 44-54.
- Cubberley, Ellwood Patterson (1919), *Public Education in the United States: A Study and Interpretation of American Educational History*, Boston, MA: Houghton Mifflin Co.
- Davis, Philip J. and Reuben Hersh (1981), *The Mathematical Experience*, Boston, MA: Houghton Mifflin Company.
- Dickens, Charles (1850), *David Copperfield*, Mineola, NY: Dover Publications, 2004.
- Grossberg, Stephen (1976), "Adaptive pattern classification and universal recoding: Part II. Feedback, expectation, olfaction, illusions," *Biological Cybernetics*, 23, 187-202, 1976.
- Grossberg, Stephen (1978), "A theory of human memory: Self-organization and performance of sensory-motor codes, maps, and plans," in *Progress in Theoretical Biology*, vol. 5, Robert Rosen and Fred M. Snell (eds.), NY: Academic Press, pp. 233-374.
- Hunt, Morton (1993), *The Story of Psychology*, Anchor Books Edition, NY: Random House, 1994.
- Hutchins, Robert M. (1959), "Preface," *An Introduction to the Great Books and to a Liberal Education*, Mortimer J. Adler and Peter Wolff, Chicago, IL: Encyclopædia Britannica, Inc., pp. v-viii.
- James, William (1890), *The Principles of Psychology*, in 2 volumes, NY: Dover Publications, 1950.
- Jefferson, Thomas (1818), Report of the Commissioners for the University of Virginia, Aug. 4, 1818, in *The Portable Thomas Jefferson*, Merrill D. Peterson (ed.), pp. 332-346, NY: Penguin Books, 1977.
- Kant, Immanuel (1800), *Logik*, in *Kant's gesammelte Schriften, Band IX*, pp. 1-150, Berlin:

- Walter de Gruyter & Co., 1923.
- Knox, Samuel (1797), "Essay on Education," in *An essay on the best system of liberal education, adapted to the genius of the government of the United States*, pp. 49-173, Baltimore, MD: Warner and Hanna, 1799. Gale ECCO Print Edition.
- Knox, Samuel (1798), "Introductory to an uniform Plan of National Education," addressed to the Maryland Legislature, in *An essay on the best system of liberal education, adapted to the genius of the government of the United States*, pp. 4-44, 1799, Baltimore, MD: Warner and Hanna, 1799. Gale ECCO Print Edition.
- Mirel, Jeffrey (2011), "Bridging the widest street in the world," *American Educator*, vol. 35, no. 2, Summer 2011, pp. 6-12.
- Pestalozzi, Johann Heinrich (1820), *How Gertrude Teaches Her Children*, 5th ed., Lucy E. Holland and Francis C. Turner (translators), London: Allen & Unwin Ltd., 1915.
- Piaget, Jean and Bärbel Inhelder (1948), *The Child's Conception of Space*, NY: W.W. Norton & Company, 1967.
- Plato (c. 4th century BC), Πολιτεία (commonly mistranslated as *Republic*), in two volumes, Cambridge, MA: Harvard University Press, 1937.
- Reber, Arthur S. and Emily S. Reber (2001), *The Penguin Dictionary of Psychology*, 3rd ed., London: Penguin Books.
- Rush, Benjamin (1788), "Plan of a federal university," in *The Selected Writings of Benjamin Rush*, Dagobert D. Runes (ed.), NY: Philosophical Press, 2008, pp. 101-105.
- Rush, Benjamin (1798), "Of the Mode of Education proper in a Republic," Philadelphia: Thomas Dobson, in *The Selected Writings of Benjamin Rush*, Dagobert D. Runes (ed.), NY: Philosophical Press, 2008, pp. 87-96.
- Smith, Adam (1776), *An Inquiry into the Nature and Causes of the Wealth of Nations*, NY: Everyman's Library, 1991.
- Smith, Samuel Harrison (1797), *Remarks on Education: illustrating the close connection between virtue and wisdom. To which is annexed a system of liberal education*, Philadelphia, PA: Printed for John Ormrod. Gale ECCO Print Edition.
- Townsend, Robert (1970), *Up the Organization*, enlarged edition, Greenwich, CN: Fawcett Publications.
- Toynbee, Arnold (1946), *A Study of History*, abridgment of volumes I-VI by D.C. Somervell, NY: Oxford University Press, 1947.
- Veysey, Laurence R. (1965), *The Emergence of the American University*, Chicago, IL: The University of Chicago Press.
- Wells, Richard B. (2009), *The Principles of Mental Physics*, available free of charge from the author's web site.
- Wells, Richard B. (2011), "On the synthesis of polysyllogisms in Critical Logic," Apr. 21, available free of charge from the author's website.
- Wells, Richard B. (2012), *Education and Society*, vol. I of *The Idea of Public Education*, available free of charge from the author's web site.
- Wells, Richard B. (2013), *Critique of the American Institution of Education*, vol. II of *The Idea of Public Education*, available free of charge from the author's web site.