

Chapter 1 The Context of Public Education

§ 1. Liberty and Public Education

No other single Idea was more central to the founding of the United States of America than the Idea of **civil liberty**. This Idea formed American values of local self-governance, free enterprise, equality under law, and anathematic disregard for the European caste division between a titled nobility and a subservient caste of commoners. From the early days of colonization Americans recognized the distinction between *civil* liberty and *natural* liberty – a distinction given popular expression in 1690 by the English philosopher John Locke:

The *natural* liberty of man is to be free from any superior power on earth, and not to be under the will or legislative authority of man, but to have only the law of nature for his rule. The *liberty of man*, in society, is to be under no other legislative power but that established, by consent, in the commonwealth; nor under the dominion of any will, or restraint of any law, but what that legislative shall enact according to the trust put in it. Freedom then is not what Sir Robert Filmer tells us, *Observations, A. 55. a liberty for every one to do what he lists, to live as he pleases, and not to be tied by any laws*: but *freedom of men under government* is to have a standing rule to live by, common to every one of that society, and made by the legislative power erected in it; a liberty to follow my own will in all things where the rule prescribes not; and not to be subject to the inconstant, uncertain, unknown, arbitrary will of another man [Locke (1690), §22, pg. 17]

Liberty in general is freedom of action *plus* the ability to *accomplish* the action undertaken. I am free to attempt anything I choose to attempt but I am not always *at liberty* to accomplish what I attempt. If I desire to fly like a bird, I am free to jump off a cliff but I am not at liberty to avoid falling to the ground. Natural liberty is liberty such that the ability to realize the undertaking of an action is constrained only by physical laws of nature. Civil liberty is liberty bound by my freely-made deontological Obligation to participate as a *citizen* in my civil Community. This is the basic agreement consented to by all people who choose to form an association with one another in a *civil* Community. Each individual *freely* agrees to alienate some of his *natural* liberties in return for *civil* liberties to be guaranteed and protected by the Community as a whole. This is **the key condition** for every social compact agreed to by members of a civil Society. Rousseau put it thus:

(As) the force and liberty of each man are the chief instruments of his self-preservation, how can he pledge them without harming his own interests and neglecting the care he owes to himself? This difficulty . . . may be stated in the following terms: "The problem is to find a form of association which will defend and protect with the whole common force the person and goods of each associate, and in which each, while uniting himself with all, may still obey himself alone and remain as free as before." This is the fundamental problem of which the *Social Contract* provides the solution. . . . If then we discard from the social compact what is not of its essence, we shall find that it reduces itself to the following terms: "Each of us puts his person and all his power in common under the supreme direction of the general will, and, in our corporate capacity, we receive each member as an indivisible part of the whole." At once, in place of the individual personality of each contracting party, this act of association creates a moral and collective body . . . The public person so formed by the union of all other persons formerly took the name of *city*, and now takes that of *Republic* or *body politic*. [Rousseau (1762), pp. 13-14]

It is for the purpose of safeguarding and improving his own personal welfare that an individual joins forces with others in a social contract, forging out of their individual welfares a general commonwealth protected by the citizens of the association from predation by those who stand outside the association and who do not bind themselves to the terms and conditions of its social

contract. Thus it is that welfare is made a key expectation under the idea of a civil Community.

Since the 1980s the United States has seen its national welfare seriously decline. The decline is visible in its economy, politics, technology, atrophy of value-added manufacturing, and in the flattening of the real personal incomes of its citizens. The U.S. economic arrest is documented in volume II of *The Idea of Public Education* [Wells (2013a)]. It is further exhibited by widespread incompetence in the leadership of U.S. organizations (demonstrated by frequent mass layoffs, so-called "outsourcing" tactics, monopolization of markets by corporate mergers effecting predatory trusts and combinations, and demonstrated lack of ability of U.S. firms to compete with foreign firms). Political breakdown is plainly visible in today's news headlines. It is regularly exhibited by antisocial actions of political parties grown incapable of governing and by the emergence of antisocial factions advocating secession from the U.S. political Union. Our technological arrest is less visible to the general public but it is a process attested to by emigration of the world's centers of science to Europe and newly arising centers in the Far East. The appearance of popular new gadgets on store shelves masks the facts that for two decades now their technologies have been invented in countries other than the United States and that U.S. companies are merely importing, repackaging, and reselling foreign inventions. The great science and technology boom fathered by the United States in the 1950s and '60s ended a third of a century ago in the United States. The U.S. is now a debtor nation and in its rising poverty it cannot afford to maintain its expensive hubris of so-called 'superpower' pretense. Decline in American innovation poses a threat to the United States' military capability of protecting our interests and citizens from foreign threats. Americans are bombarded daily from all quarters by deceitful propaganda (both political and commercial) and there is a widespread distrust of nearly all our institutions to an extent that was unthinkable in 1960. Our national welfare is much worse off today than a half century ago.

These are all alarming symptoms of an old historical process documented nearly seventy years ago by Toynbee: the process of a civilization undergoing decline and fall from within [Toynbee (1946a, b)]. We are paying the price of a century of disastrous blunders in the institution of public education in America. Education alone cannot stop the process of breakdown and disintegration, but the process cannot be stopped without it. However, *real* improvement in education is unlikely to be achieved unless education reform is derived from the work of an objectively valid social-natural *science* of education. Such a science is the topic of *The Institution of Public Education*.

When a new form of governing the United States of America went into effect in March of 1789 it was founded upon a revolutionary Idea I have elsewhere called the American Republic [Wells (2010a)]. General notions of Societies called republics were not unfamiliar to the Framers of the U.S. Constitution. The oldest Western example was that of the Roman Republic. Others, such as the government of Holland in 1780, had also emerged. Montesquieu had published his essay in 1748, in which he had introduced the idea of what he had called a confederated republic [Montesquieu (1748)]. Montesquieu's idea greatly influenced the Framers. Rousseau had likewise presented his idea of a republic in 1762 [Rousseau (1762)], although Rousseau's essay was not widely known in 1787 America. Thomas Paine had rallied Americans to republicanism in 1776.

The American Idea of Republic was radical. The Framers took and used ideas that had been put forward in the past but they adapted and blended those ideas to fit the unique culture that had grown into an American civilization. The American Republic contained in its governing structure some democratic mechanisms but it was not a democracy. The character of its new general government had some aspects and mechanisms of federalism but it was not a federal government. It had some aspects and mechanisms of nationalism but it was not a national government [Hamilton, *et al.* (1787-8), No. 39]. The Idea of the American Republic was unique in Western history. There was no government like it prior to 1789, there has been no government like it since 1828. Present day government in the United States at all levels has devolved into the form of a democratic-republic with most of the disempowerments of the people inherent in the antisocial

tendencies of every democracy and all the inherent instabilities governance-by-*rulership* always produces [Mill (1861), chap.7, pp. 75-79; Toynbee (1946a), pp. 244-246]. As Mill wrote in 1859,

The struggle between Liberty and Authority is the most conspicuous feature in the portions of history with which we are earliest familiar, particularly in that of Greece, Rome, and England. But in old times this contest was between subjects . . . and the government. By Liberty was meant protection against the tyranny of the political rulers. The rulers were conceived . . . as in a necessarily antagonistic position to the people whom they ruled. They consisted of a governing One, or a governing tribe, or caste . . . The aim, therefore, of patriots was to set limits to the power which the ruler should be suffered to exercise over the community, and this limitation was what they meant by liberty. . . . A time, however, came in the progress of human affairs when men ceased to think it is a necessity of nature that their governors should be an independent power opposed in interest to themselves. It appeared to them much better that the various magistrates of the State should be their tenants or delegates, revocable at their pleasure. In that way alone, it seemed, could they have complete security that the powers of government would never be abused to their disadvantage. . . . As the struggle proceeded for making the ruling power emanate from the periodical choice of the ruled, some persons began to think that too much had been attached to the limitation of the power itself. . . . What was now wanted was, that the rulers should be identified with the people; that their interest and will should be the interest and will of the nation. . . . But, in political and philosophical theories, as well as in persons, success discloses faults and infirmities which failure might have concealed from observation. . . . The "people" who exercise the power are not always the same people as those over whom it is exercised, and the "self-government" spoken of is not the government of each by himself but of each by all the rest. . . . The limitation, therefore, of the power of government over individuals loses none of its importance when the holders of power are regularly accountable to the community, that is, to the strongest party therein. This view of things . . . has had no difficulty in establishing itself; and in political speculations "the tyranny of the majority" is now generally included among the evils against which society requires to be on its guard. [Mill (1859), pp. 1-4]

The Framers attempted to design the American Republic they envisioned to include safeguards against the violations of civil liberty and breach of social contract inherent in any Society that suffers itself to be *ruled* by *any* subset of its members. Madison wrote,

The first question that offers itself is, whether the general form and aspect of the government be strictly republican? It is evident that no other form would be reconcilable with the genius of the people of America; with the fundamental principles of the revolution; or with that honorable determination to rest all our political experiments on the capacity of mankind for self-government. [Hamilton, *et al.* (1787-8), no. 39, pg. 209]

By "republican" Madison meant the Idea of the American Republic, and this Idea did not embrace the democratic-republic introduced by the rise of national political parties in the United States in the 1820s. In the nearly two centuries that have elapsed since parties seized the government, political parties proved themselves to be anti-Republican cancers in the body politic of America.

A Critique of the history of government in the United States soon reveals that there were several mistakes made by the Framers that left vulnerabilities in the system they devised [Wells (2010a)]. It also shows that they were aware the plan they laid down was not perfect and therefore they attempted to provide safeguards in the form of the power to peacefully amend government and its institutions. For the wielding of this power, public education was recognized by many of them to be essential for the preservation of civil liberty and maintenance of the political Union of the United States. Mistakes that led to the failure of the American institution of public education to fulfill this-its-most-vital role were Critiqued in volume II of this work [Wells (2013a)].

One of the Framers' most important mistakes – the mistake that, more than any other, enabled many serious subsequent mistakes – was the failure to recognize that public education is a necessary function of Republican governance [Wells (2010a), chap. 10; Wells (2012), chap. 1]. Specifically, within the three branches of American government (legislative, executive, and judicial), public education, by the nature of its primary objective, is a *necessary* part of the *judicial* branch. Even so, a social-natural science of public education does not fall exclusively within the Idea of a social-natural political science because of its more or less obvious factors of psychology, social-natural sociology, and social-natural economics. Education science lies inside a peculiar overlap of all these sciences and *ipso facto* its theory and practice belong to a social-natural science distinctive in its own right and acting as an adhesive bond for the others.

§ 2. Social-Natural Science and Education

Have you ever paused to wonder about the naming convention that calls physics, chemistry, and biology "natural sciences" but calls political science, economics, sociology, and history "social sciences" as if there might be something *unnatural* about social phenomena? In point of fact, the latter sciences have struggled since their inventions in the early 19th century (in the case of sociology) or re-inventions in the later 19th and early 20th centuries (in the cases of political science and economics, both of which *were* social-natural sciences in 1787)¹. The influence of 19th century positivism has been especially harmful to the social sciences. Positivism contributed directly to vain attempts by practitioners of the new social sciences to mimic the methods and the thinking of the physical-natural sciences, overlooking the fact that, whereas the physical-natural sciences study only dead-matter objects, in social phenomena *people* are the *agents* of all events.

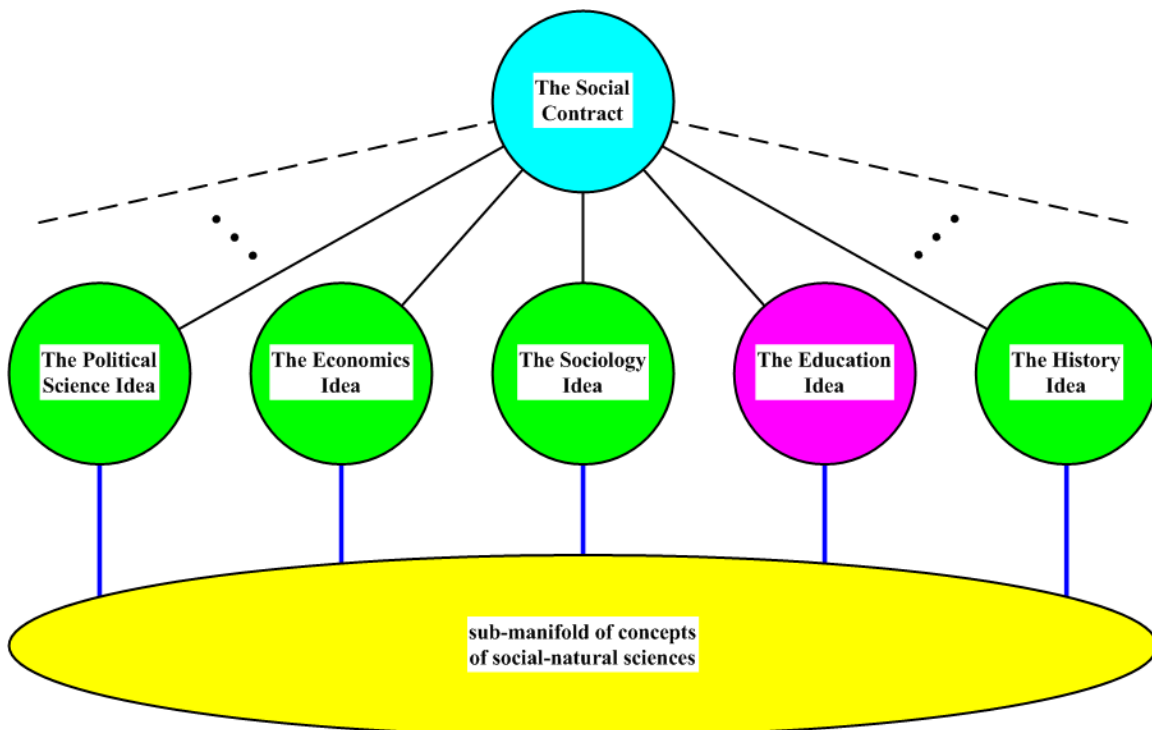


Figure 1: The manifold organization of social-natural sciences.

¹ In the West we credit the invention of history as a craft to Herodotus in *c.* 445 BC. The ancient Greek title of his book, *Istoriai*, meant "research, learning by inquiry." History has struggled ever since its invention to make itself into a social-natural science. As with the others, the agency of people has been its big challenge.

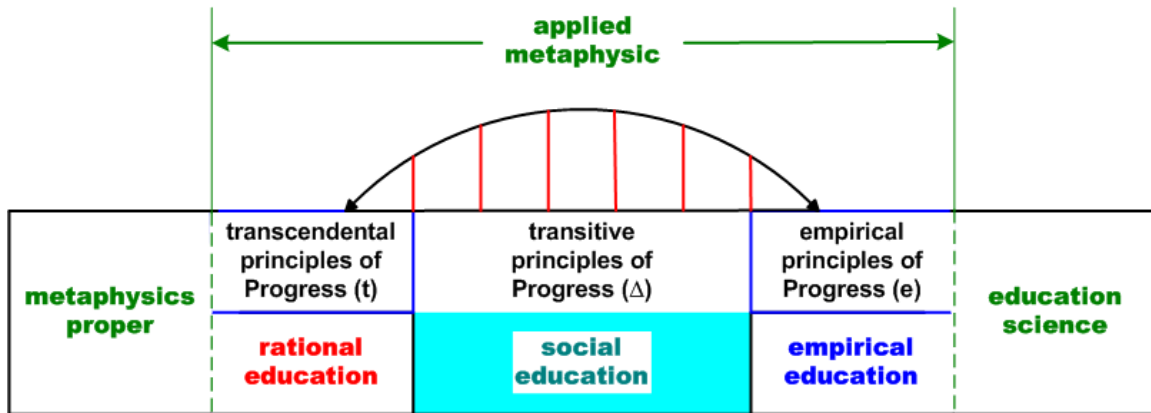


Figure 2: Bridge structure of the transition from metaphysics to empirical science for the case of education.

There are many who dismiss any claim that the social sciences are sciences at all or that it is possible for them to become true sciences. In every university in America the social sciences are segregated from the officially recognized natural sciences. Skepticism over the possibility that social sciences can ever be true sciences reminds me of an answer allegedly given by New York Mets manager Casey Stengel to a reporter who asked him why his catcher had called for so many curve balls during a baseball game the Mets had just lost. Casey is said to have answered, "He can't hit one, so he doesn't think anyone else can either." It seems to me the skeptics are like Casey's catcher. But the issue does raise the question, "What is a natural science?"

It is a little-known fact that our modern distinction between 'natural philosophy' and 'natural science' was first drawn by Kant. Isaac Newton, regarded as the father of physics, called his work "natural philosophy," as did all other notable scientists of his day. Kant lectured extensively year after year about the real distinction between natural philosophy and natural science². In Critical terminology *science is a doctrine constituting a system in accordance with a principle of a disciplined whole of knowledge*. If this knowledge is knowledge of the sensible world – that is, if the objects of a disciplined systematic doctrine are objects of possible sensuous experience – then the doctrine is a doctrine of a *natural science*. Otherwise it is a *mathematical science*.

There is no fundamental hindrance prohibiting any of the social sciences from being made into natural sciences. However, social-natural sciences take for their Objects *social* phenomena, and in this they are *different in kind* from the physical-natural sciences of physics, chemistry, biology, and their offspring. This difference is due to the Objects that constitute the "social atoms" for all social-natural sciences, and these are none other than individual human beings. The existing social sciences have all tried to avoid the obvious manifold difficulties of treating with individual human-beings-as-human-beings, and this has been their stumbling block. The new science of mental physics [Wells (2009)] makes it possible for the first time to do so in a systematically disciplined way. It is as Protagoras said: "Man is the measure of all things." When we Critically examine the nature of social phenomena, we discover that the Idea grounding our principle of the disciplined whole of knowledge for social-natural phenomena is the Idea of the Social Contract [Wells (2012b)]. The different specialized topics of social-natural science are coordinated *under* this Idea, as illustrated in figure 1.

Although infirmities of old age prevented him from completing it *systematically*, near the end of his life Kant also discovered a doctrine for securing objective validity in empirical sciences

² Kant's lectures are contained in *Kant's gesammelte Schriften*, volumes 28.1 (Berlin: Walter de Gruyter & Co., 1968), 28.2.1 (Berlin: Walter de Gruyter & Co., 1970) and 29.1.2 (Berlin: Walter de Gruyter & Co., 1983).

[Kant (1804)]. Systematic development of Kant's doctrine is recent, coming some two centuries after Kant's death via discovery of the Critical science of mental physics [Wells (2011)]. The doctrine erects a hierarchical structure joining metaphysical knowledge and empirical principles leading without crack or breach from Critical metaphysics to empirical science and *vice versa*. Figure 2 is a metaphorical representation of this as a "bridge" between foundational metaphysics and empirical science. The figure illustrates the case for an empirical social-natural science of education. The previous two volumes of *The Idea of Public Education* have been building up to completing this spanning structure for education science here in this volume.

§ 3. The Challenge of Mini-Community

It is one of the eyebrow-raising wonders in the history of political science that the *Dasein*³ of mini-Communities has long been noticed yet largely ignored by political science theory. I call this historical situation "eyebrow-raising" because the phenomenon of mini-Community leads to numerous challenges that constantly threaten to tear apart the parent Society in which the mini-Communities flourish. Mini-Community is the Achilles' heel of the one-man-one-vote principle of democracies and republics alike. It is a principal source of domestic unrest and violent civil disturbance. It is the original breeding ground of factions and the incubator of tyranny. And, at the same time, it is the natural product of the human inclination to form social alliances. It should therefore not be surprising that the challenge of mini-Community is one of the primary challenges that any institution of public education must meet and find a way to overcome or else succumb to failure. An institution of public education that fails to meet the challenge of mini-Community is an institution that turns on its Society to the mutual assured destruction of both.

John Dewey was aware of the *Dasein* of mini-Community and some of the appearances of its *Existenz*. He wrote,

Society is one word but many things. Men associate together in all kinds of ways and for all kinds of purposes. One man is concerned in a multitude of diverse groups, in which his associates may be quite different. It often seems as if they had nothing in common except that they are modes of associated life. Within every larger social organization there are numerous minor groups: not only political subdivisions but industrial, scientific, religious associations. There are political parties with differing aims, social sets, cliques, gangs, corporations, partnerships, groups bound closely together by ties of blood, and so [on] in endless variety. [Dewey (1916), pp. 89-90]

Dewey recognized that the mini-Community phenomenon gave importance to what he called "the full and free interplay [of mini-Communities] with other forms of association." Indeed, it would be the exhibition of such full-and-free-interplay among mini-Communities that was to be taken as a standard for recognizing what Dewey called "democracy." Herein, though, lies a fatal flaw in his theory of education. Dewey's theory looked for cooperation among mini-Communities as an *outcome* of progressive education but his theory contained nothing for *causing* this outcome or even biasing the tendencies of human nature toward producing it. While Dewey's observation is indeed correct and important, wishing for some particular outcome does not guarantee it happens.

³ Under Critical examination, the idea of "existence" is found to have two universal aspects. These can be termed the 'matter' and the 'form' of existence. The idea of the matter of existence is the idea of an object to which predications are referred. This object constitutes the logical subject of all predications concerning it. Existence in the context of *Dasein* pertains to the recognition that some object exists but goes no further than simply declaring that "there is" a transcendental object. Simply put, *Dasein* refers to "what exists" but makes no statement whatsoever concerning "how it exists." Existence in this latter aspect is called *Existenz*. The mental combination of a *Dasein*-concept of a transcendental object and the totality of all concepts of its form (concepts representing its forms of *Existenz*) is called an Object (a capitalized word in English).

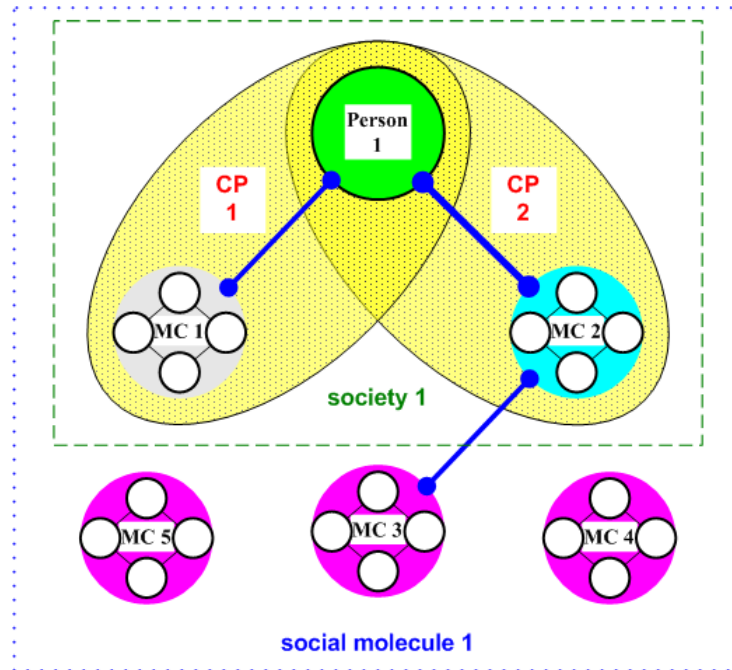


Figure 3: Illustrative model of a person's personal society and his social bonding in mini-Communities. MC = mini-Community. CP = corporate person. Every corporate person constitutes a mini-Society.

The phenomenon of mini-Community is grounded in one of the most important theorems in the Critical theory of the Social Contract: *Every person determines his own society*. Figure 3 illustrates the form of personal society. There is an important real difference between the concept of a society and that of a Society (capitalized). It is this. A society is a mathematical object of a mathematical concept formed *by an individual* that: (1) is suitable for one or more of his purposes; (2) makes its principal quantities represent appearances of individuals; (3) has no *ontological* significance whatsoever as an object; and (4) in logical essence is regarded as a concept of relationships and associations. A Society is the object that is understood by a *higher concept* of divers individual concepts of society, retaining what is contained in common among these divers concepts and represented by a mathematical field⁴. Like a society, a Society is a mathematical object – which means it is a *made* object rather than a physical object and its concept carries no ontological significance whatsoever. A Society is an Object of theoretical understanding, not of sensuous empirical nature. Its concept understands aspects of sensible human behavior in a community environment of interacting human beings.

In the sets of corporate persons in which a particular person is a member (figure 3), the mathematical union set of all the persons who are bound by a common social compact constitutes a mini-Community insofar as these people commonly and freely have consented to self-govern their own actions to comply with the terms and conditions of their common social compact. Mini-Community distinctions are distinctions of social compacts by which divers mini-Communities are distinguishable. Thus it follows that through localized social compacting different mini-Communities are formed. It also follows as a corollary that *every person is simultaneously a member of more than one mini-Community*.

In Critical metaphysics an **interest** is *an anticipation of a satisfaction or a dissatisfaction combined with a representation of the Existenz of some object of desire*. Every person has his

⁴ A mathematical **field** is a mathematical representation of objects in objective space and time describing the ways these objects interact and affect each others' accidents of appearance.

own self-determined interests, and these interests are not necessarily identical even for members of the same particular mini-Community. An interest of a person A and an interest of a person B are said to be *congruent interests* if satisfaction of interest by either of them does not necessarily prevent the other's satisfaction of his interest. A mini-Community's interests subsist in its sets of congruent personal interest combinations. Where a mini-Community's interest is not shared by other mini-Communities with which it interacts, that interest is called a *special interest*. When two mini-Communities hold *congruent* mini-Community interests, these interests are called *common interests*. Common interests are nucleating points for the association of two (or more) mini-Communities in a larger (more extensive) mini-Society. Mini-Societies, in their turns, can likewise share common mini-Society interests with other mini-Societies, and these common interests nucleate associations in still more extensive mini-Societies.

I think perhaps it is more or less obvious to you from the brief description just given that the mathematical modeling of a Society is not a trivial undertaking. Figure 4 is an illustration of the sort of social field implied by the definition of a Society. Interactions among persons in a Society are determined in part by the personal societies of each member and the overlap of these societies from person to person. One mathematical technique for describing a Society is to use the concept of a mathematical field in ways analogous to the treatment of the physics of metals. Such a model is a social-chemical metallic bonding model called a SAMO model [Wells (2013a), chap. 11]. Quantitative treatment of Societies and Communities is challenging in terms of the mathematics and analysis methods required for a field structure like figure 4, yet the task is far from impossible. Over the years, and particularly over the immediately past half-century, the sciences of system theory and mathematical physics have worked out, and continue to work out, viable methods of modeling and analyzing extremely complex systems. The previous volumes in *The Idea of Public Education* have named some examples of these methods used by engineering and the materials sciences. The point I wish to make is that once a valid model structure is identified, analysis of this structure has already-known methods that can be employed.

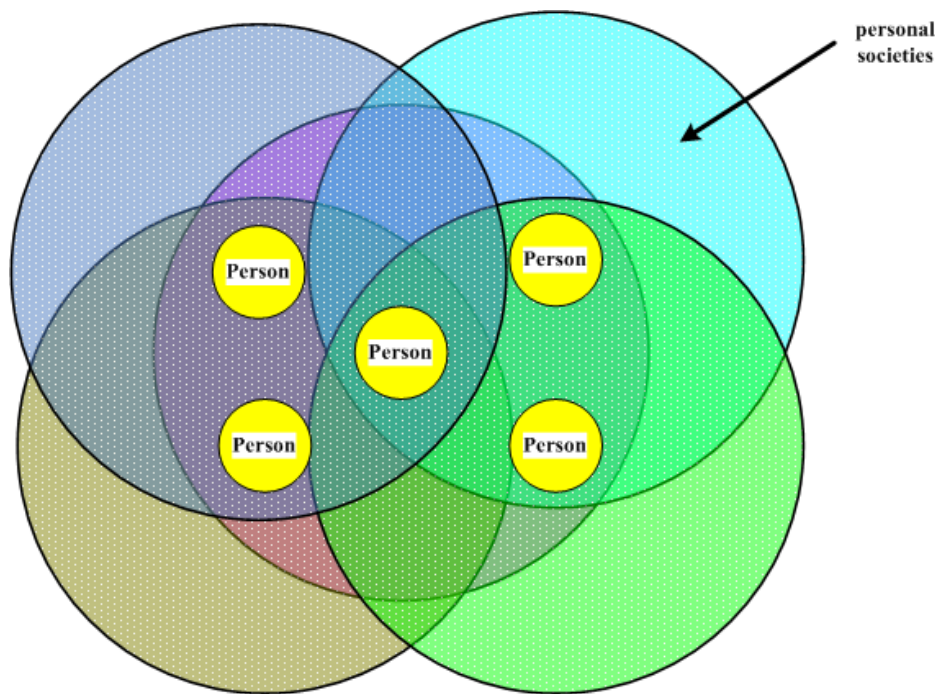


Figure 4: Illustration of the field structure of a Society in terms of overlapping personal societies defined by its members. Structures of this sort are called social-chemical metallic bonding models by analogy with the theory of metallic bonding in physical solids (i.e., the theory of metals in physics).

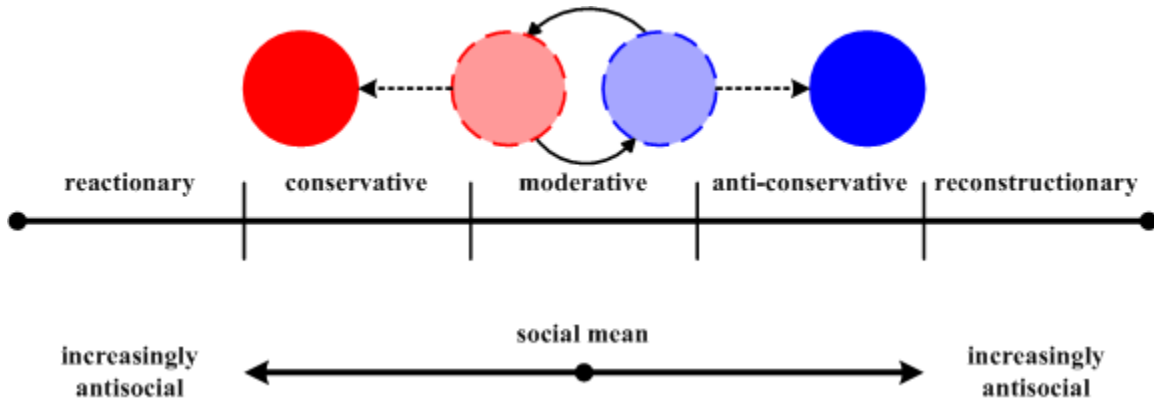


Figure 5: Illustration of social granulation through antibonding interactions between mini-Communities. The solid arrows between the 'red' and 'blue' mini-Communities denote interactions between them. The dashed arrows denote the 'movements' of each mini-Community to more antagonistic interest positions.

Where the problems of obtaining quantitative scientific understanding of mini-Communities and Societies differ from analogous problems in the physical-natural sciences is in the nature of the social atom and the mental physics governing their interactions. One can, for example, speak of "social forces" but one should not expect these forces to follow Newton's Laws. One can speak of social-chemistry and social-chemical bonds, but one should not expect these bonds to have the same mathematical expression as physical-chemical bonding among atoms in physical chemistry theory. It is mental physics, not dead-matter physics, that governs the agency of our social atoms. This is to say that social-natural sciences differ in kind from physical-natural sciences. To mimic the methods of dead-matter physics wholesale in social-natural science is a bankrupt mimesis. The problems of social-natural sciences are more difficult than those of dead-matter physics and, in comparative terms, physics is the easiest of the natural sciences (which is why it has acquired the greatest mathematical sophistication presently found in the sciences). Contrary to the childish boasting of some physicists, physics is not "the queen of the sciences." Critical metaphysics is.

The challenge of mini-Communities intimately involves another important theorem of system dynamics that was discovered by Grossberg twenty-eight years prior to the discovery of mental physics [Grossberg (1978; 1980)]: *cooperative dynamics arise out of competitive dynamics*. This is known as Grossberg's theorem and has been previously discussed in the earlier volumes of *The Idea of Public Education*. Part of Grossberg's theorem tells us that cooperation between mini-Communities is not automatic, i.e., is not necessarily the dynamic that arises merely from the fact that two mini-Communities are in interaction with one another. There are general conditions required before cooperation can emerge and these conditions mandate that the competing mini-Communities establish a basic social compact each obliges itself to obey. Failure to establish these conditions produces antibonding relationships between them that tend to produce social granulation and uncivic (outlaw) competition between them. Figure 5 illustrates in simplified form the nature of such an uncivic dynamic in the context of mini-Community interests for effecting changes in a parent Society that includes both mini-Communities. One mini-Community tends to become more antisocial (in relationship to the other) in the direction of becoming more reactionary; the other tends to become more antisocial in the direction of becoming more reconstructionary. Society disintegration occurs when either or both mini-Communities adopt state-of-nature relationships with the other and the competition between them devolves into a state of civil war. At that point, no social contract between them exists and their mutual Society is destroyed. In a state of nature, justice has no objectively valid real meaning.

The illustration of figure 5 is an example of one mini-Community growing more reactionary while the other grows more reconstructionary. However, this is not the only possible case. Other

examples include: (1) both mini-Communities growing more reactionary in defense of their special interests; and (2) both mini-Communities growing more reconstructionary in regard to their parent Society, but reconstructionary along incongruent lines of special interests. Any of these cases are possible in a Society in which political party factions are allowed to exercise *rulership* of the parent Society – such as is the present situation in the United States. This cannot be marked down as one of Mill's cases of "success disclosing faults and infirmities." John Adams, who was one of America's corps of capable social-natural political scientists at the time of the American Revolution, precisely predicted *in 1790* our present situation in 2014:

In elective governments, where first magistrates and senators are at stated intervals to be chosen, these, if there are no [political] parties, become at every fresh election more known, considered, and beloved by the whole nation. But if the nation is divided into two parties, those who vote for a man become the more attached to him for the opposition that is made by his enemies. This national attachment to an elective first magistrate, where there is no competition, is very great. But where there is a competition, the passions of his party are inflamed by it into a more ardent enthusiasm. If there are two candidates, each at the head of a party, the nation becomes divided into two nations, each of which is, in fact, a moral person, as much as any community can be so, and are soon bitterly enraged against each other. . . . Where there are rivals for the first place, the national attention and passions are divided, and thwart each other; the collision enkindles fires; the conflicting passions interest all ranks; they produce slanders and libels first, mobs and sedition next, and civil war, with all her hissing snakes, burning torches, and haggard horrors at last. [Adams (1790), pp. 162-164]

Adams was only wrong about one thing. Party competition does not produce two nations but, instead, three: the two he mentions and a third made up of people who refuse to join with either of the other two and instead form what Toynbee called a *proletariat*. When a civilization (or a Society) disintegrates and falls, Toynbee found

the principal and essential challenge was a human challenge arising out of the relationship to the (Society) to which they were affiliated. This challenge is implicit in the relationship itself, which begins with a differentiation and culminates in a secession. The differentiation takes place . . . when that civilization begins to lose the creative power through which, in its period of growth, it had at one time inspired a voluntary allegiance in the hearts of the people When this happens the ailing civilization pays the penalty for its failing vitality by being disintegrated into a dominant minority, which rules with increasing oppressiveness but no longer leads, and a proletariat (internal and external) which responds to this challenge by becoming conscious that it has a soul of its own and by making up its mind to save its soul alive. The dominant minority's will to repress evokes in the proletariat a will to secede; and a conflict between these two wills continues while the declining civilization verges towards its fall until, when it is *in articulo mortis*⁵, the proletariat at length breaks free from what was once its spiritual home but has now become a prison-house and finally a City of Destruction. [Toynbee (1946a), pg. 77]

George Washington likewise tried to warn Americans to beware of political party factions:

Let me now . . . warn you in the most solemn manner against the baneful effects of the Spirit of Party generally. This spirit, unfortunately, is inseparable from our nature, having its root in the strongest passions of the human Mind. It exists under different shapes in all Governments, more or less stifled, controlled, or repressed; but, in those of the popular form it is seen in its greatest rankness and is truly their worst enemy.

The alternate domination of one faction over another, sharpened by the spirit of revenge

⁵ "at the point of death"

natural to party dissension, which in different ages and countries has perpetrated the most horrid enormities, is itself a frightful despotism. But this leads at length to a more formal and permanent despotism. The disorders and miseries which result gradually incline the minds of men to seek security and repose in the absolute power of an individual: and sooner or later the chief of some prevailing faction, more able or more fortunate than his competitors, turns this disposition to the purposes of his own elevation on the ruins of Public Liberty.

Without looking forward to an extremity of this kind (which nevertheless ought not to be entirely out of our sight) the common and continued mischiefs of the spirit of Party are sufficient to make it the interest and the duty of a wise People to discourage and restrain it. . . . There is an opinion that parties in free countries are useful checks upon the Administration of the Government and serve to keep alive the spirit of Liberty. This within certain limits is probably true . . . But in [Governments] of the popular character, in Governments purely elective, it is a spirit not to be encouraged. From their natural tendency it is certain there will always be enough of that spirit for every salutary purpose. And there being constant danger of excess, the effort ought to be, by force of public opinion, to mitigate and assuage it. A fire not to be quenched, it demands a uniform vigilance to prevent its bursting into a flame, lest instead of warming it should consume. [Washington (1796), pp. 969-970]

The challenge of mini-Community can only be met through the thoughtful consensus of reaching a social contract agreed to by competing mini-Communities. Such a social contract can only exist based on common interests. There are two considerations here of direct and immediate pertinence to this treatise. The first pertains to necessity for public education that aims to broaden citizens' understandings of common interests in a civil Community, the second to administrative organization of the institution of public education. In regard to the first, Mill wrote,

When we talk of the interest of a body of men, or even of an individual man, as a principle determining their actions, the question what would be considered their interest by an unprejudiced observer is one of the least important parts of the whole matter. As Coleridge observes, the man makes the motive, not the motive the man. What it is the man's interest to do or refrain from doing depends less on any outward circumstances than upon what sort of man he is. . . . Everybody has selfish and unselfish interests, and a selfish man has cultivated the habit of caring for the former and not caring for the latter. Everyone has present and distant interests, and the improvident man is he who cares for the present interests and does not care for the distant. It matters little that on any correct calculation the latter may be the more considerable if the habits of his mind lead him to fix his thoughts and wishes solely on the former. . . .

Governments must be made for human beings as they are, or as they are capable of speedily becoming; and in any state of cultivation which mankind, or any class among them, have yet attained or are likely soon to attain, the interests by which they will be led, when they are thinking only of self-interest, will be almost exclusively those which are obvious at first sight, and which operate on their present condition. It is only a disinterested regard for others, and especially for what comes after them, for the idea of posterity, of their country, or of mankind . . . which ever directs the minds and purposes of classes or bodies of men towards distant or unobvious interests. And it cannot be maintained that any form of government would be rational which required as a condition that these exalted principles of action should be the guiding and master motives in the conduct of average human beings. [Mill (1861), pp. 71-73]

All mutual Obligations and concepts of civic Duties to which human beings commit themselves are *derived* Obligations and Duties. Obligations- and Duties-to-Self are primary in the mental physics of human Self-determination. But without mutual Obligation and civic Duty no Society can endure. The implication of the phenomenon of human interests is therefore clear: *citizenship*

education is a necessary function of public education so that the future citizens of a Society are cultivated to habitually make their motives take into account the civil public interests, however "distant and unobvious" these interests may be, as they determine how to best serve their own personal and mini-Community interests. Citizenship cannot be taken for granted because the Duties of citizenship *all* belong to the "remote" interests of which Mill speaks.

In regard to the second Pertinence, because common interests subsist only in subsets of the interests of each mini-Community, their alliance by social contract can be made no otherwise than if the civil liberties they agree to alienate become *fewer* as the scale of the Society *increases*. The more nationally applicable the rules and laws are made, the fewer of them *can* be made such that the mini-Community interests they involve are congruent. Civilizations rise and fall in the march of history, and intervals of dark ages intervene between the fall of one and the rise of its successor. Yet the fall of a civilization is in no way necessitated by human nature. The fall of a civilization or a Society is *self-inflicted* by the manner in which it makes its public institutions – and this is a factor entirely within the power of a united People to determine. Emerson wrote,

In dealing with the State, we ought to remember that its institutions are not aboriginal, though they existed before we were born; that they are not superior to the citizen; that every one of them was once the act of a single man; every law and usage was a man's expedient to meet a particular case; that they are all imitable, all alterable; we may make as good: we may make better. Society is an illusion to the young citizen. It lies before him in rigid repose, with certain names, men, and institutions rooted like oak trees to the center, round which all arrange themselves the best they can. But the old statesman knows that society is fluid; there are no such roots and centers; but any particle may suddenly become the center of the movement and compel the system to gyrate around it . . . Republics abound in young civilians, who believe that the laws make the city; that grave modifications of the policy and modes of living, and the employments of the population; that commerce, education, and religion may be voted in or out; and that any measure, though it were absurd, may be imposed on a people if only you can get sufficient votes to make it a law. But the wise know that foolish legislation is a rope of sand, which perishes in the twisting; that the State must follow and not lead the character and progress of the citizen . . . and they only who build on Ideas build for eternity: and that the form of government which prevails is the expression of what cultivation exists in the population which permits it. The law is only a memorandum. [Emerson (1844), pp. 275-276]

Centralization of power, so cherished by the incompetency of Taylorism, is an acid that burns away the social bonds that unite mini-Communities into one civil Society. This applies as equally to the institution of public education as it does to the political government of a Society. The American spectacle of power becoming increasingly centralized as governance ascends from the local to the state to the national levels is inevitably fatal to the Union of the United States and can culminate in nothing else than the Balkanizing of the nation. America has no warrant to be smug about the collapse and disintegration of the Soviet Union. We are drawing near to the same sort of end. This *theorem* applies to *every* public institution, including the institution of public education.

Yet and at all times, it must be kept in mind that a swing from centralization to its opposite is more swiftly and immediately fatal to a Society. Granulation into nothing but small *independent* governments and institutions is equally fatal to Union. The ultimate expression in this direction is anarchy, which is nothing else than the complete disintegration of the Society into pure state-of-nature conditions. Like the two antisocial poles depicted in figure 5, solution of the problem *necessarily* requires a system that balances interests at the different ascending levels of the scale of mini-Societies to achieve a workable social mean. The term for this in Critical Social Contract theory is *Tocqueville governance* of institutions and the Republic. It is one of the issues this treatise must and will address insofar as the institution of public education is concerned.

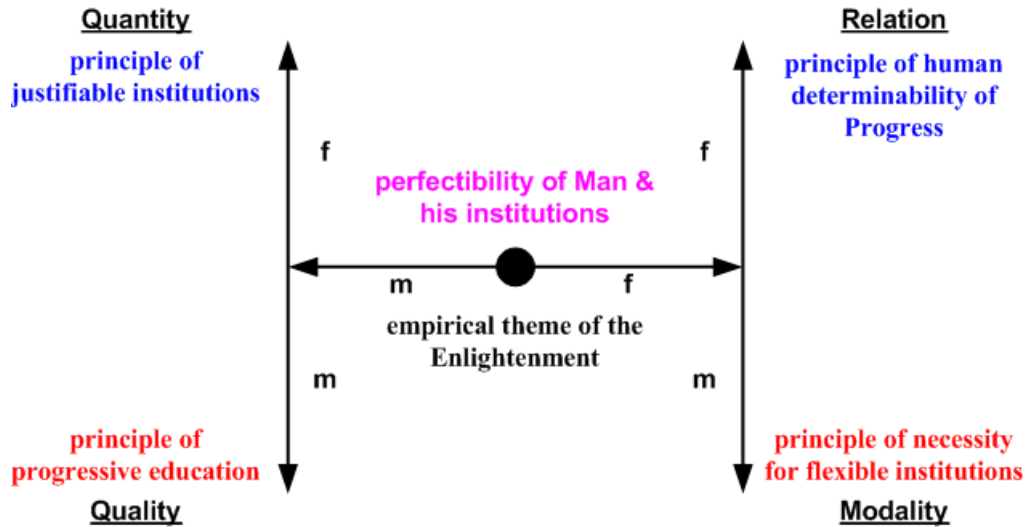


Figure 6: 2LAR of the Enlightenment principles of public institutions.

§ 4. The Principles of Enlightened Institutions

It is not incorrect to say that the Idea of the American Republic was a child of that great movement of cultural intellection history calls the 18th century Age of Enlightenment. Enlightenment thinkers championed reason and individualism over tradition. They promoted the advancement of knowledge through scientific methods, reasoning through scientific thinking, skepticism about old and dogmatic traditions, and free intellectual exchange. They generally opposed superstition and intolerance. Scholars are unable to agree upon precise beginning and ending dates for the movement. My own preference is to view it as having its seed planted by Bacon (1561-1626) with germination of its roots in the latter half of the 17th century in the works of Spinoza (1632-1677), Locke (1632-1704), Bayle (1647-1706), and Isaac Newton (1643-1727). The Enlightenment proper I regard as taking place from the first to the last decades of the 18th century. Its principal figures included Voltaire (1694-1778), Montesquieu (1689-1755), Diderot (1713-1784), Alembert (1717-1783), Rousseau (1712-1778), and Kant (1724-1804). Prominent Americans strongly influenced by the Enlightenment include Benjamin Franklin, Thomas Jefferson, Noah Webster, Benjamin Rush, Thomas Paine, John Adams, Alexander Hamilton, and James Madison. Immediate influences of the Enlightenment on the American Revolution are reflected in Paine's *Common Sense*, the Declaration of Independence, and the Bill of Rights.

Enlightenment principles in regard to social institutions, as judged from the major works of the Enlightenment authors cited above, can be structured as a 2LAR (figure 6) around a central empirical theme, *viz.* the Idea of the perfectibility of Man and his institutions. The empirical principles regulating this theme are: (1) the principle of justifiable institutions; (2) the principle of progressive education; (3) the principle of the human determinability of Progress; and, (4) the principle of the necessity for flexible institutions. During the Enlightenment era these principles were discussed in qualitative terms and, consequently, precise functional *momenta* required by Critical analysis were not clearly brought out. Indeed, the correct statement of the principles in terms of Critical synthesizing functions could not be scientifically stated without taking into account the *homo noumenal* Nature of human beings, and the science of this Nature was not fully developed prior to the year 2006 [Wells (2006)].

In this chapter the four empirical principles of the Enlightenment are reviewed in the form in which they are popularly understood by scholars in the 19th and 20th centuries. In the context of public education, perhaps the best discussion of them was provided by Hansen (1926), although

one must exercise a robust degree of caution when studying Hansen's book. Hansen was not only an education historian but was also an early partisan in the Progressive Education Movement. In the latter role he sometimes displays the influence the PEM had on how he interprets the history. Two examples of this are: (1) he persistently uses the Deweyan-PEM term "democracy" when he should use the term actually used by the Founders, i.e., "republic"; and (2) he overstates the importance of Rousseau in Revolutionary and post-Revolutionary thinking. Rousseau's work was apparently known to Noah Webster but prior to 1791 Rousseau's writings had not been published in England, and a first American edition was not published until 1797 [Hansen (1926), pp. 283, 287]. During debate at the 1787 Constitutional Convention, Montesquieu was mentioned by name but Rousseau was not [Farrand (1911)]. The writings of Thomas Hobbes, John Locke, and Montesquieu were, on the other hand, well known to the Founding Fathers and the congruence of, particularly, Locke's views on the social contract with those of Rousseau more than adequately explains appearances of Rousseau-like doctrines in the American deliberations⁶.

The principle of Quantity is the **principle of justifiable institutions**. The principle held that all human institutions are justifiable only if they contribute to the advancement and welfare of mankind. Some comments are in order here. First, Enlightenment thinkers tended to generalize their moral principles to take in all of mankind rather than human Societies. However, all of the Enlightenment thinkers were ontology-centered in the way they viewed morality and moral customs. With some of them, their moral thinking fell into the general classification that is today called Consequentialist ethics (a category that includes utilitarianism with its Epicurean roots). With others, their moral thinking fell within the category of Virtue ethics, a viewpoint with roots in Platonic philosophy and, through Neo-Platonism, Christian moral doctrine. Even Kant, who developed a third category of moral philosophy (deontological ethics), here reverted to ontology-centered thinking by adopting the Enlightenment notion of a vague *noumenon* called Humanity⁷. In doing so, he violated his own first principle of metaphysics, which is to center metaphysics on epistemology and deduce ontology theory from that basis⁸. A consequence of this – for which there is strong evidence that it was a designed consequence – was to introduce a theocentric factor into Kant's *specific* formulation of moral theory. Figure 7 illustrates how Kant's notion of Humanity enters into his moral theory in comparison with traditional Christian religious moral doctrine. Introducing this ontology-centered factor into his thinking introduced a number of antinomies in Kant's formulation of moral theory, for which later scholars correctly criticized his theory, e.g., Nell (1975). Only a *pure* theory of deontological ethics (which is to say a theory that remains entirely epistemology-centered) can be established with real objective validity and thereby make a social-natural science of moral theory.

Second, this factor in Enlightenment thinking bears directly on the idea of "justifiable." In the

⁶ As I have remarked in *Leadership* (chapter 3), Rousseau is a fascinating historical puzzle. That he was one of the major contributors to the Enlightenment is beyond debate. That he was a spiritual father of the Romanticism movement is likewise generally accepted. Ironically, the Romanticism movement and the Enlightenment movement were opposed to each other and Romanticism is sometimes called the Counter-Enlightenment movement. Here in this opposition of contraries we see one example of the historical riddle wrapped in a mystery inside an enigma who was Jean-Jacques Rousseau.

⁷ Palmquist has correctly pointed out that Kant's moral theorizing had a theocentric bias [Palmquist (2000)]. This bias made it difficult to separate moral theory from religious theory in Kant's writings and produced antinomies, as Wood (1992) points out. It seems most likely that this is a reflection of an old traditional bias in philosophy fathered by the Scholastics in the Middle Ages – namely, that metaphysics must take in theology. In fact, metaphysics and theology are doctrines different in kind. The former deals only with the natural world (and is part of natural science), while the latter grapples with *supernature*, i.e., religion.

⁸ Kant himself never used the word "epistemology" in any of his works. The reason, however, is very simple. The word 'epistemology' was not invented until 1854, a half century after Kant's death. Prior to then philosophy did not explicitly recognize 'epistemology' and 'ontology' as separable aspects of metaphysics.

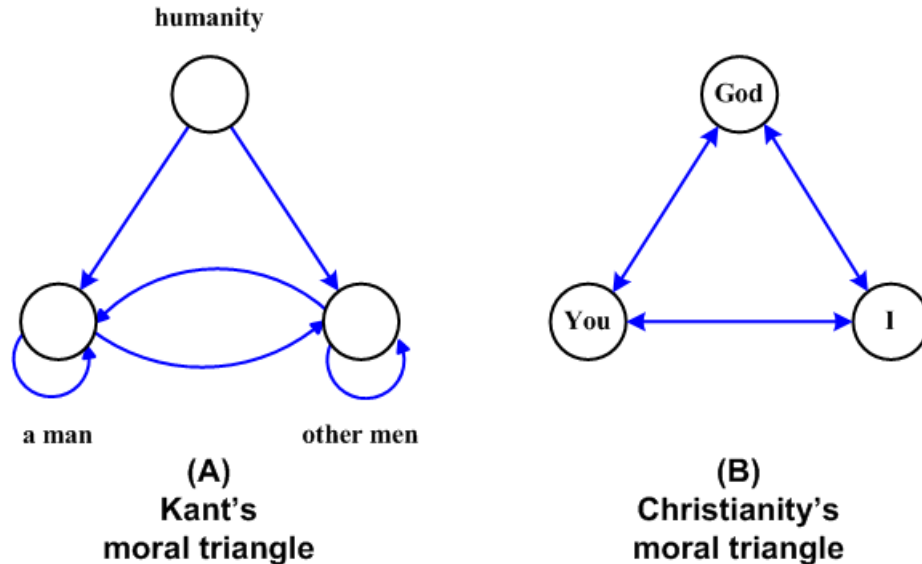


Figure 7: Kant's moral triangle (A) and the traditional Christian moral triangle (B).

context in which this word is used by Enlightenment thinkers, an institution is 'justifiable' if and only if the institution serves a purpose of social justice. But the notion of *justice* has no *real* context (and therefore no real meaning) *outside* the context of a civil Community bound together by a social contract. *Within* that context, *unjust* is *anything that breaches or contradicts the condition of the social contract* and *justice* is *the negating of anything that is unjust*. The *justice system* of a Society is the instituted mechanisms of governance for the purpose of realizing justice within a Community or a Society. The Enlightenment thinkers over-generalized the principle of justifiable institutions. Public instructional education is one of the institutions that come under the principle and is 'justifiable' if and only if its institution is *either* a necessary condition of establishing justice in a Society *or* is agreed to by unanimous consent of the citizens of that Society. When the Quantity principle is applied to the organization of an empirical social-natural science of education, this context of 'justifiable' must also be applied. It follows that the principle requires a Critical restatement, i.e., *all human institutions are justifiable only if they contribute to the advancement and welfare of the instituting Society*. A rather obvious corollary also follows: *No agent of the institution of public education can justify perpetrating any unjust action*. Unjust actions are never justifiable.

The principle of Quality is the **principle of progressive education**. The principle states: *education is the principal means for Progress in any Society*. This principle is not self-evident on first reading. To understand its implications requires an examination of what is expected of all public institutions in a civil Community by the members of that Community. These expectations are the source of all expectations of authority⁹ that are vested in the institution by the citizens. This Critical idea of authority is essentially different from the traditional idea of rulership. In a civil Community under a social contract, the people are Sovereign and this means *no agent of its institutions is empowered to rule*. Agents are public servants, not rulers. Furthermore, rulership is

⁹ In Critical theory, *authority* means possession of the *Kraft* of causing something to become greater, to increase, to be strengthened, or to be reinforced in some way. An *expectation of authority* is a demand by citizens of a Community that a person holding a position as a designated authority figure possess the *Kraft* of authority and will actualize it for the benefit of their common association. An *authority figure* is the position of an agent of leadership governance charged with the Duty of causing the association's general success and welfare to become greater, to be strengthened, or to be reinforced. Success and welfare are measured in terms of Progress and Order in the general Community.

a deontological *crime* in a civil Community because it always violates the social contract. Every authority figure in a civil Community must walk a fine line between Duty-bound actions of leadership and uncivic actions of rulership, and he must never cross this line [Wells (2010b)].

In its practical context, **governance** is *the exercise of authority in the management and the administration of the leadership dynamics within a Community*. **Government** is *the system of institutions formed by members of a Society for the purpose of realizing Order and Progress through the dynamics of governance*. Good government is government that improves the state of perfection of social Order and Progress in the Society. Bad government is government that is antagonistic to the realization of Order or Progress.

Now, *public* education is such institution of governance. Historically, Societies have failed to recognize public education as an institution of governance for as far back as the historical record takes us. It is worth noting that the first Western institutions of education were private institutions, not public ones [Marrou (1948)], and it is deontologically correct to set institutions of private education outside the scope of institutions of government. When public education was invented it was understood in the same traditionally habituated terms by which private education had always been viewed.¹⁰ I am tempted to say it is a common bad habit when we fail to pay attention to modifying adjectives like "private" and "public" (English teachers please note: Where else in our school system could the appropriate place to break this habit of ignoring adjectives reside if it is not in your classroom?). One factor involved in this habituated *misunderstanding* of public education was the antisocial habituated idea of mistaking rulership for just government.

Even if one is inclined by habit to think it improper to include public education within the scope of government, this inclination is confronted by one irremediable fact, *viz.*, that *the agency of government always exercises effects, either for public good or public evil, on the educational Self-development of its citizens*. Agencies of government can no more forego being causes of this effect than a human being can forego breathing because this causality is inherent in the nature of human interrelationships in any Society. Mill noted,

The first element of good government, therefore, being the virtue and intelligence of the human beings composing the community, the most important point of excellence which any form of government can possess is to promote the virtue and intelligence of the people themselves. The first question in respect to any political institutions is, how far they tend to foster in the members of the community the various desirable qualities, moral and intellectual; or rather . . . moral, intellectual, and active. The government which does this the best has every likelihood of being the best in all other respects, since it is upon these qualities, so far as they exist in the people, that all possibility of goodness in the practical operations of the government depends.

We may consider, then, as one criterion of the goodness of government, the degree in which it tends to increase the sum of good qualities in the governed, collectively and individually; since, besides that their well-being is the sole object of government, their good qualities supply the moving force which works the machinery [of government]. . . .

We have now, therefore, obtained a foundation for a twofold division of the merit which any set of political institutions can possess. It consists partly of the degree in which they promote the general mental advancement of the community, including under that phrase advancement in intellect, in virtue, and in practical activity and efficiency; and partly of the degree of perfection with which they organize the moral, intellectual, and active worth already existing, so as to operate with the greatest effect on public affairs. A government is to be judged by its actions upon men and by its actions upon things; by what it makes of the citizens and what it does with them; its tendency to improve or deteriorate the people

¹⁰ The single exception to this appears to have been the *agōgē* of ancient Sparta [Kennell (1995)].

themselves, and the goodness or badness of the work it performs for them and by means of them. Government is at once a great influence acting on the human mind and a set of organized arrangements for public business; in the first capacity its beneficial action is chiefly indirect, but not therefore less vital, while its mischievous action may be direct. [Mill (1861), pp. 18-21]

The Enlightenment principle of Quality is, therefore, not to be seen as a platitude but, rather, as a keen insight into the social-nature of government dedicated to liberty-with-justice for *all* citizens in an organized Society.

The first two principles are principles of *composition* for the idea of the institutions of an Enlightened Society. The next two are principles of *nexus*. In terms of matter and form of Society-in-general, the two principles of composition speak to the purposive 'what' of public institutions; the principles of *nexus* speak to the 'how' of their organization.

The principle of Relation is the principle of **human determinability of Progress**. It states: *men design lines of human Progress*. Enlightenment thinkers debated how these designs could best be determined. Their answer was *by means of scientific methods*. The principle implies the primacy of science in determining, moderating, and controlling progressive social innovation instead of reliance upon tradition, superstition, imitation, or fiat. Echoing Emerson, Mill wrote,

Let us remember, then, in the first place, that political institutions (however the proposition may at times be ignored) are the work of men; owe their origin and their whole existence to human will. Men did not wake up on a summer morning and find them sprung up. Neither do they resemble trees which, once planted, "are aye growing" while men "are sleeping." In every stage of their existence they are made what they are by human voluntary agency. Like all things, therefore, which are made by men, they may be either well or ill made; judgment and skill may have been exercised in their production, or the reverse of these. And again, if a people have omitted, or from outward pressure have not had it in their power, to give themselves a good constitution by the tentative process of applying a corrective to each evil as it arose, or as the sufferers gained strength to resist it, this retardation of political progress is no doubt a great disadvantage to them, but it does not prove that what has been found good for others would not have been good also for them, and will not still be so still when they think fit to adopt it. [*ibid.*, pp. 3-4]

In this quote and his previous one, Mill speaks of 'political institutions' and, given the context of *Representative Government*, the focus of his essay is clearly fixed on those institutions we have by long habit come to associate with political science, politics and government. In these contexts, dictionary definitions of 'political' and 'politics' have both positive and negative connotations, and none of these dictionary connotations implicate the institution of public education. Why, then, is what Mill tells us here pertinent to the institution of public education? Here it is important to note that these long-standing usages represent only a subset of the Objects originally implicated in the Greek roots of our English word, *viz.*, *politikos* (relating to a citizen) and *polis* (a city). There is a broader theme contained in the Enlightenment idea going beyond the narrow understanding of 'political institution' and encompassing in scope a broader connotation, *i.e.*, **political** is *anything pertaining to citizens and citizenship*. Public education is a political institution because it is established for purposes of promoting civil Order and aiding in the achievement of civil Progress. Montesquieu wrote,

It is in a republican government that the whole power of education is required. . . . It is not the young people that degenerate; they are not spoiled till those of maturer age are already sunk into corruption. [Montesquieu (1748), pg. 34]

The Enlightenment principle applies to all human institutions, not merely government-in-

general or education-in-particular. If well-made institutions are products of human design, this implies that political institutions (including education) are to be properly thought of as products of what can be termed *social engineering*. This leads to a follow up question, namely: who are the designers of institutions? To reply, "It could be anyone," although true insofar as human potential is concerned, is to answer without answering. What endows an individual with those qualities by which he obtains valid authority to act as an institution-engineer? By what credentials are his abilities to be known by others? What reviews and oversights of his work are appropriate? *Quis custodiet ipsos custodes?*¹¹ These are crucial questions implicated by the principle of Relation.

It seems clear enough that capable designs require capable designers, and that a person with *practical* knowledge about how a desired end might best be achieved is a more capable designer than a person who has only speculative knowledge or romantic opinions about what to do. But to say this merely re-raises the question at the next deeper level. Aristotle wrote,

Again, each man judges correctly those matters with which he is acquainted; it is of these that he is a competent critic. To criticize a particular subject, therefore, a man must have been trained in that subject: to be a good critic generally, he must have had an all-round education. [Aristotle (date unknown), pg. 9 (1094^b30-1095^a1)]

It has become traditional to assume that an "expert" is and must be a narrow specialist in whatever field he said to be "an expert" or "an authority." Consequently, most of our so-called 'experts' today are "an inch wide and a mile deep." This reflects an ancient Greek presumption that Plato accepted without question and enshrined in his *Politeía* [Plato (c. 4th century BC)]. John Dewey likewise embraced this idea as did also the Progressive Education Movement in the 20th century [Wells (2013b)]. But this idea is demonstrably false when in its usual practice it is carried toward its logical extreme in defiance of a bit of commonsense wisdom captured by the aphorism

A specialist is a man who knows more and more about less and less until eventually he knows everything about nothing. A generalist is a man who knows less and less about more and more until eventually he knows nothing about everything. [Anonymous]

In his study of arrested Societies Toynbee noted,

Two characteristics, common to all these arrested societies, stand out conspicuously – caste and specialization [Toynbee (1946a), pg. 181].

Arrested Societies are Societies that are no longer achieving Progress. Socio-economically, the United States is becoming such a Society. Division of labor, a key factor of Progress in economic systems, works only up to a point and beyond this point there comes a stage when cooperations among diverse specialists is only accomplished by the establishment of standards – which almost by definition acts to halt further Progress for lack of *interdisciplinary* knowledge necessary to unite the divisions of labor in a common unity of purpose.¹² In matters purely static, standards can be useful inasmuch as they are recipes for non-innovative routine carried out by rote mimesis. But, as Toynbee also warns, they are signs of a great and mortal danger to any Society that has become dependent upon them because *what came next* for most arrested Societies in the records of history was *breakdown, disintegration, and the fall of the Society*:

When we have completed our analysis we shall find that the qualitative change which

¹¹ "Who will watch those who watch?" This is one of the knottiest problems in social organization.

¹² If you throw together a collective made up solely of specialists, you do *not* have an "interdisciplinary team." You have a hodge-podge of disciplinarians barely able to communicate with one another. Interdisciplinary knowledge is *practically-sufficient* knowledge of *several* disciplines possessed by *one* person.

disintegration brings with it is exactly opposite in character to that which is the outcome of growth. . . . We shall find that . . . the qualitative effect of disintegration is standardization. This tendency towards standardization is the more remarkable when we consider the extent of the diversity which it has to overcome. The broken-down civilizations bring with them, when they enter on their disintegration, the extremely diverse dispositions – a bent towards art or towards machinery or whatever the bent may be – that they have severally acquired during their growth. [*ibid.*, pg. 367]

In America today, the word "scientist" has come to be used almost synonymously with the word "specialist." This, however, ignores the fact that a science is a doctrine constituting a system in accordance with a principle of a disciplined *whole* of knowledge. A person can be *more* expert (specialized) in one or a few areas than in the majority of others, but this does not preclude having *breadth* of practically-sufficient knowledge in *many* fields. The trend toward science over-specialization in America began in the thirty year period from 1880 to 1910 when the nation's colleges instituted a series of radical reforms [Veysey (1965), pp. 127, 142-144]. From there, a recipe for specialization spread to the Progressive Education Movement and led to the differentiated curriculum and the 'tracking' of pupils into different specialties within the public schools. This is antagonistic to cultivation of Renaissance-like abilities and it is **anti**-progressive.

Specialization was not what Enlightenment thinkers had in mind for the principle of Relation or envisioned for application of scientific methods for designing social institutions. Rather, they envisioned as wide a diffusion of as much knowledge as possible for as many people as possible. Jefferson touched upon this in a letter he wrote in 1786:

If all the sovereigns of Europe were to set themselves to work to emancipate the minds of their subjects from their present ignorance and prejudices, and that as zealously as they now endeavor to the contrary, a thousand years would not place them on that high ground on which our common people are now setting out. . . . I think by far the most important bill in our whole code¹³ is that for the diffusion of knowledge among the people. No other sure foundation can be devised for the preservation of freedom and happiness. If anybody thinks that kings, nobles, or priests are good conservators of the public happiness, send them here [to Paris]. It is the best school in the universe to cure them of that folly. . . . Preach, my dear Sir, a crusade against ignorance; establish and improve the law for educating the common people. Let our countrymen know that the people alone can protect us against these evils, and that the tax which will be paid for this purpose is not more than the thousandth part of what will be paid to kings, priests, and nobles who will rise up among us if we leave the people in ignorance [Jefferson (1786)].

The design issue for the principle of Relation is one about which this treatise has much to say.

The Modality principle is the principle of **necessity for flexible institutions**. It states: *human institutions must be designed to accommodate changes affecting Society as they occur insofar as these changes alter the circumstances challenging Society's civil Communities*. This principle goes beyond what is stated or implied by the principle of Relation, aiming at the *matter* of how institutions are to be designed.¹⁴ Hansen had some difficulty getting his hand around the Modality principle, but this is not an uncommon difficulty with ideas of Modality.¹⁵ He wrote,

The dynamic interpretation of life called for a change in attitude toward institutions.

¹³ Jefferson is referring to the legal code of Virginia, which was at that time being revised by the Virginia legislature.

¹⁴ Modality is the matter of *nexus*; Relation is the form of *nexus*.

¹⁵ Quantity, Quality, and Relation pertain to judgments of Objects. Modality pertains to judgments of judgments. Modality connections are connections between the objective and the subjective in knowledge.

William Godwin said, "Man is not . . . a perfect being, but perfectible. No government that has yet existed, or is likely presently to exist upon the face of the earth, is faultless. No government ought therefore pertinaciously to resist the change of its own institutions." . . . This doctrine of development demanded a refashioning of institutions, such a refashioning as would permit life to develop freely. The Encyclopædist movement was an attempt to find a philosophical basis of human action and to secure progress through reason as developed through scientific education.¹⁶ There could be no finality such as had characterized the long-standing institutions of Europe. Such finality enchained rather than liberated man. . . . The doctrine set forth in Bacon's *Atlantis*, that society should definitely organize itself for regular periods of readjustment¹⁷, found expression in the eighteenth century through the writings of Voltaire, Diderot, Saint-Simon, and others. That is, institutions should be reconstructed as often as the changes in circumstances demanded and new enlightenment had been gained. [Hansen (1926), pp. 9-10]

Toynbee found that every challenge a civilization successfully meets contains in its successful resolution the seed of another future challenge that will eventually confront it. He tells us there are three possible responses a Society can make to a challenge confronting it. He wrote,

One source of disharmony between the institutions of which a society is composed is the introduction of new social forces – aptitudes or emotions or ideas – which the existing set of institutions was not originally designed to carry. . . . Ideally, no doubt, the introduction of new dynamic forces ought to be accompanied by a reconstruction of the whole set of institutions, and in any actually growing society a constant readjustment of the more flagrant anachronisms is continually going on. But *vis inertiae* tends at all times to keep most parts of the social structure as they are, in spite of their increasing incongruity with new social forces constantly coming into action. In this situation the new forces are apt to operate in two diametrically opposite ways simultaneously. On the one hand they perform their creative work either through new institutions that they have established for themselves or through old institutions that they have adapted to their purpose; and in pouring themselves into these harmonious channels they promote the welfare of society. At the same time [the new forces] also enter, indiscriminately, into any institution that happens to be in their path – as some powerful head of steam which had forced its way into an engine house might rush into the works of any old engine that happened to be installed there.

In such an event, one or the other of two alternative disasters is apt to occur. Either the pressure of the new head of steam blows the old engine to pieces, or else the old engine somehow manages to hold together and proceeds to operate in a new manner that is likely to prove both alarming and destructive.

To translate these parables into terms of social life, the explosions of the old engines that

¹⁶ Please note that Hansen says "scientific education," not "education in science." The two are not the same thing and the former is broader in scope than the latter. Scientific education is education based on findings of a science *of* education. Education *in* a science can be either: (1) a broad familiarization with a special science aimed at teaching the learner what the science is about, what its methods are, what its principal findings are, what its basic hypotheses and primitives are, and *what the limits are for the objective validity of its findings and theory*; or (2) in-depth study of the practices, past observations, theories, and findings of a special science aiming to teach the learner to be a practitioner of that science. The first takes a perspective of an intelligent non-specialist looking at a science from the outside; the second adopts the perspective of a disciplinary specialist looking at a science from the inside.

¹⁷ If you read Bacon (1624), you might find it a little difficult to make out this doctrine because it does not appear as an explicitly stated doctrine. Perhaps the best way to read *New Atlantis* is to think of it as an Aesop's fable containing a moral-to-the-story. Bacon's Atlantis is an ideal civilization and he intends us to understand that he endorses all of its policies and customs. The doctrine Hansen cites has to be milked from Bacon's story. Do not let the fact it is a fable turn you away; this fable inspired the founding of the Royal Society in Great Britain, the first and oldest institution for the regular dissemination of science knowledge.

cannot stand the new pressure . . . are the revolutions which sometimes overtake anachronistic institutions. On the other hand, the baneful performances of the old engines which have stood the strain of being keyed up to performances for which they were never intended are the social enormities which a "die-hard" institutional anachronism sometimes engenders. . . . If harmonious adjustments predominate, the society will continue to grow; if revolutions, its growth will become increasingly hazardous; if enormities we may diagnose a breakdown. [Toynbee (1946a), pp. 279-281]

130 years earlier Thomas Jefferson expressed a similar maxim for the American Republic:

I am certainly not an advocate for frequent and untried changes in laws and constitutions. I think moderate imperfections had better be borne with because, when once known, we accommodate ourselves to them and find practical means of correcting their ill effects. But I also know that laws and institutions must go hand in hand with the progress of the human mind. As discoveries are made, new truths disclosed, and manners and opinions change with the change of circumstances, institutions must advance also and keep pace with the times. We might as well require a man to wear still the same coat which fitted him as a boy as civilized society to remain ever under the regimen of their barbarous ancestors. . . . Let us, as our sister states have done, avail ourselves of our reason and experience, to correct the crude essays of our first and unexperienced, though wise, virtuous, and well-meaning councils. [Jefferson (1816), pg. 559]

In the terminology of system theory, flexible institutions would be called adaptive systems and the need for them is caused by what mathematicians call "ill-posed problems." Ill-posed problems in mathematics present one subarea that goes untaught in all but a very few, usually graduate level, college courses. Well-posed problems – the staple of mathematics education – are different in kind from ill-posed ones. Well-posed problems admit to well-posed direct solutions. For ill-posed problems, *the problem itself* cannot be stated with sufficient precision to allow for *direct* methods of solution. What is necessary for their solution is to understand how, in effect, to design systems *to design themselves* by a process of trial-and-error or by heuristics. This means that cultivating skills for designing flexible institutions requires cultivating mathematical abilities that by and large are not cultivated in existing institutions of public education. Human beings are in most cases heuristic problem solvers dealing almost daily with ill-posed problems. Our skill in doing so is one factor in saying human beings are more intelligent than animals. However, this skill is not, all by itself, sufficient for proficiency in the design of complex systems for solving ill-posed problems. To do that with reliability and efficiency requires a distinctive kind of education.

This completes a first look at Enlightenment principles of scientific institution. To have come up with these principles was no small achievement for the Enlightenment thinkers. It is not sufficient, however, because to reduce these principles to practice requires a Critical substructure of synthesizing *momenta* – three for each of the four headings [Wells (2009), chap. 2]. Because the 2LAR of empirical principles anchors practices of an empirical science of education, this Enlightenment 2LAR must be completed. That objective is taken up in chapter 2.

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