Chapter 14 Epilegomenon

§ 1. Social-Natural Sciences and Metaphysics

I use the word "epilegomenon" to mean a backward-looking analysis and summary for the purpose of extending a doctrine or topic to its future applications and uses. There will not be much occasion for additional analysis in this chapter, but this treatise has been a long one and a contextual summary and recapitulation of major implications of the Idea of the Social Contract seems a good idea.

All natural sciences are practical sciences – meaning that they can be reduced to useful practices and applied for the benefit of human beings. Every science has a core ontology of the special objects with which that science is concerned and an Idea of a topic that unifies the doctrine of knowledge that science contains. For social-natural sciences, the core ontology is that of the social science atom – the individual human being. For a science to be a proper science, the rational part of its doctrine must always be objectively valid. Because every science is the created product of human beings, and because the rational part of that science is mathematical, objective validity for the science itself can be sought nowhere else than from principles of Critical metaphysics and the theory of mental physics.

Objective validity for the doctrine of a science always requires an applied metaphysic from which it obtains its first principles. The applied metaphysic focuses the general principles of Critical metaphysics upon the topic of the science by specializing these general principles through synthesis with the ideas of special objects to which the special science is to be applied. All special sciences are properly empirical because otherwise they cannot be reduced to practice in the physical world (Slepian facet A). The applied metaphysic is the bridge connecting the general first principles that apply to all natural sciences generally with the special cases of real experience dealt with empirically by a special science. Figure 14.1 illustrates this idea of the role of applied metaphysics. The applied metaphysic provides the transition principles (transitive principles) that connect the transcendental principles of rational science to the empirical principles of scientific practice. The objective of the applied metaphysic is to provide the valid metaphysical principles of the science's Object and doctrine of method. Aristotle wrote,

> Scientific Knowledge is a mode of conception dealing with universals and things that are necessary; and demonstrated truths and all scientific knowledge (since this involves reasoning) are derived from first principles. Consequently the first principles from which scientific truths are derived cannot themselves be reached by their Science; nor yet are they apprehended by Art, nor by Prudence. To be a matter of Scientific Knowledge a truth must be demonstrated by deduction from other truths. [Aristotle (date unknown), *Nicomachean Ethics*, VI. vi]
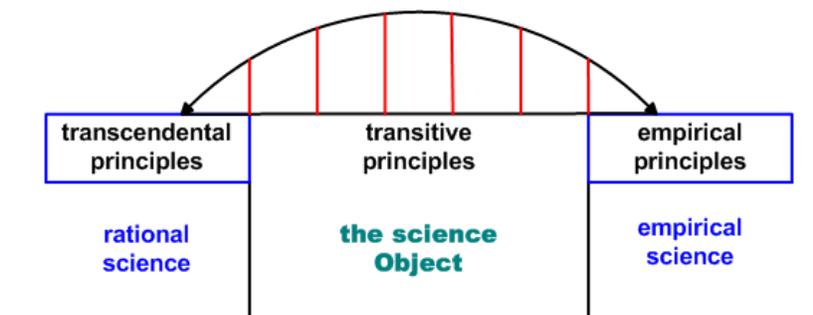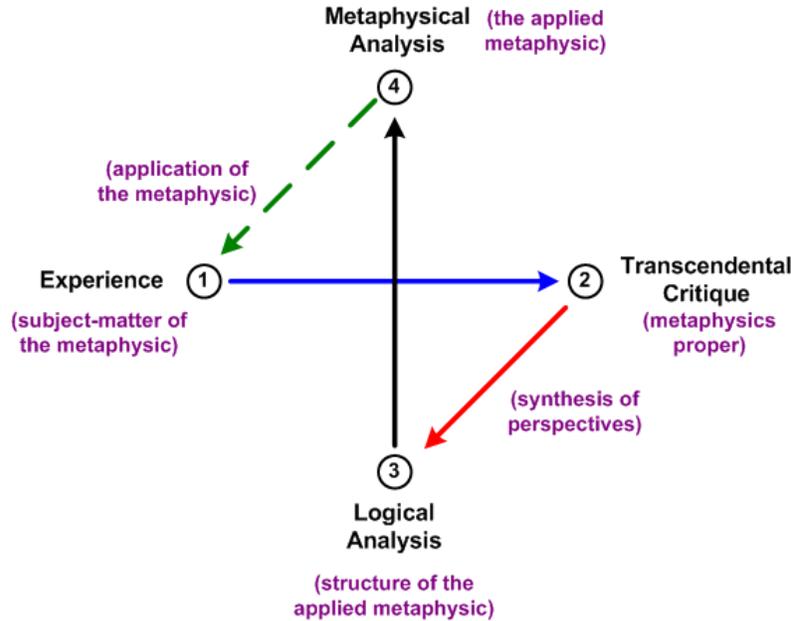

Figure 14.1: The bridge model of an applied metaphysic.

Figure 14.2: Palmquist 12CR figure for the synthesis of an applied metaphysic.

The development of a Critical applied metaphysic follows a procedural doctrine I have previously explained in Wells (2011). Done properly, the methodology follows a mathematical procedure and applies the transcendental Ideas of Critical metaphysics to the Object of the science by means of practical specifying concepts peculiar to the empirical science for which this is to be the applied metaphysic. Figure 14.2 illustrates the process followed in this methodology.

In the 19th century, the positivists drummed philosophy out of the ranks of science. This has been a detriment to both. It ended the Age of Enlightenment and set humankind adrift in a tide that eventually leads nowhere but to another Dark Age. Remember that for all its grandeur the Roman Empire was the last gasp of falling Hellenic civilization and its appearance marked the beginning of the Dark Ages in Europe. The *fall* of Rome does not really mark the start of the Dark Ages. It only marks the point where everyone could see the darkness and where the process could no longer be stopped. The fall of the Roman Republic and *rise* of the Roman Empire marks the true start of the European Dark Ages. Let us not ignore the social lessons of history and let us recognize that Santayana was correct when he said a people who do not remember their past are condemned to repeat it.

Where are we today? Positivism has died and been replaced by nothing. All the efforts by philosophers to produce useful and correct ontology-centered systems of metaphysics have continued to flounder and fail (as ontology-centered metaphysics always will). It is long past time for philosophers to remember the meaning of the word "philosophy" and take up the mantel once more of treating it as not only a science but as the science of sciences. If the academic vocation of philosophy is to justly call for the support of society, that vocation must re-focus itself on useful theories, and this philosophers can do by making themselves engineers of Critical systems of applied metaphysics. My friends, we have a great deal of urgent work to catch up on. The need for social-natural sciences has never been greater than it is today, and helping to bring them about is social Progress. In the meantime, if the physical-natural sciences – especially physics – are to be saved from devolving into modern Neo-Platonism, they need similar care and feeding. This serves social Order.

For those of us who hold an office of citizen-philosopher, we are charged with the making of

these contributions to Progress and Order. It is the Duty of our office in meeting the expectation of authority of our fellow citizens, and that Duty alone *justifies* the public support we receive.

§ 2. Social Nature and the Stakes Riding on Social-Natural Science

This treatise has demonstrated the oft-proposed speculation that man has a social instinct is not correct. There is no such instinct in *Homo sapiens*. Human behavior is satisficing behavior and is governed by practical imperatives and practical maxims of experience that each person develops for himself. Each person constructs his practical manifold of rules in pure practical Reason on the basis of his contingent experience of living. This rule structure forms a *de facto* personal moral code and constitutes a logic of actions.

The highest unconditioned practical rules in this manifold constitute practical hypothetical imperatives of action. When stimulated, the behaviors resulting from their expression express Duties-to-Self that the individual will act to satisfy in service of the categorical imperative for equilibrium, which is the highest law governing the *homo noumenal* Nature of man. Satisfaction of a Duty-to-Self is realized through the person's employment of the power of his person (his *Personfähigkeit*), which is the instrument of Self-Order for the human being. Socializing experience is comprised of the satisficing experiences the individual comes to know while he is still in childhood and in which satisfactions are realized through his social intercourse with other individuals. His moral judgment develops through these experiences, by means of the construction of new and higher practical imperatives that condition the previously highest ones. By means of this development, the person passes through developmental stages of individualism to moral realism to cognizance of moral rules in his practical actions, and from an initial motor stage of actions to stages of egocentrism and then cooperation with other people.

Habits of cooperative behavior develop out of those experiences of social transactions with other people where satisfaction is achieved from a *quid pro quo* of exchange of some sort. The experience is the ground for the development of practical tenets that express the formation of reciprocal Duties connecting the situation of the person with the situation of others. Social bonding between the individuals is said to occur when both co-develop such tenets. The development is first *practical* and only later is cognized and codified in thinking in a person's manifold of concepts. Such moral concepts function as instruments of judgmentation by which the individual discovers he can improve the power of his person through socialized interpersonal behavior, and this improvement and betterment of his *Personfähigkeit* is practical Self-Progress. This is the ground in the *homo noumenal* Nature of man's agency out of which grow all moral customs (mores and folkways) that come to largely govern interpersonal intercourse among people whose lives put them in contact with one another in the normal commerce of living. At the root of social development lies an anticipation, thought by each person, that social cooperation will prove to be satisficing in its outcome and that each can better serve his Duties-to-Self through assuming and fulfilling Obligations and Duties-to-others. This is the social-contracting phenomenon of human behavior. Cooperative *commercium* in behaviors among individuals is the mark of appearance of a Society as a civil Community.

The development and perfection of this cooperative *commercium* is marked by increasingly more robust and general maxims of interaction and a growing scope of cognizance that can be properly called the individual's social intelligence. The degree of this social intelligence can be grossly categorized into three levels: natural society, free society, and ideal society. Each of these is described in terms of the role played by thinking and judgmentation in individuals' Self-determinations of their own actions. Natural society is grounded in personal affective judgments reciprocated by other people. Free society is grounded in unanimities of meanings shared by a group of people. Ideal society is grounded in symbolic thinking and judgmentation insofar as the

meanings of symbols is shared by the group of people. Ideal society is the society of symbolic ideals. This progressive development in social intelligence is a dynamical development of an Ideal called the *Volks*-society.

The development of social intelligence can be arrested at any point along this stage-wise progression by disbenefits and adverse consequences of competition among individuals. Such disbenefits or adverse (non-satisfying) results lead to the contrary social situation, namely, to the formation of anti-bonding relationships and enemy-building. This in no way means forming a civil Community is achievable by attempting to impose a ban on competition because the emergence of cooperative behavior is fundamentally grounded in competition and competitive interactions. Man has no cooperation instinct nor does he have a competitive instinct. The phenomenon of competition is an immediate consequence of Self-satisficing behaviors motivated at root by Duties-to-Self. Without competition there is no external stimulus of tension within the individual to trigger re-evaluation and ratio-expression cycles of judgmentation, which alone produce maxims and, later, concepts of cooperation. Were possible to ban competition (which it is not), to do so would be to ban cooperation in the same stroke. Man has no innate social instinct.

Although state-of-nature competitive interactions are the point of origin necessary for the possibility of developing cooperative and civil interactions, once Community formation begins to take place unrestricted state-of-nature liberty of competition becomes increasingly antagonistic to further development and perfection of civil Community. State-of-nature competitive liberties can produce local biases and asymmetries in the social interconnections of groups of people that tip the outcomes of experience towards orientations to hostility, anti-bonding relationships, and enmity. This arrests the development of civic intelligence and sunders the unanimity of meaning that is essential to Progress towards free society. Indeed, such sundering can reverse the direction of development and lead to a devolution that results in disintegration of Community. However, it is not competition *per se* that produces this. It is specifically state-of-nature liberty of competition that produces it. *Civil* liberty of competition, in contrast, promotes further development of civic intelligence and Progress in Society. It is a great error to presume that competition *per se* is either any sort of absolute good or any sort of absolute evil. The distinction between state-of-nature liberty of competition and civil liberty of competition is, therefore, an essential distinction insofar as social contracting, Order in Society, and Progress in Society are concerned.

The history of the 19th and 20th centuries is marked by the development of two principal and mutually-antagonistic Platonic theories of socio-economics: Hegelian-based Communism and Darwinian-based state-of-nature free market Capitalism. Both theories are erected on objectively invalid prejudices and presuppositions, are objectively groundless in regard to Society, and both are fundamentally antagonistic to the sustainability of civil Community. Both lead to social disintegration and both orient human social intercourse dynamics towards the fall of civilizations and the re-occurrence of that predominantly state-of-nature condition called a Dark Age. Both theories are predicated on presuppositions that go in ignorance of the human Nature of the Social Contract.

When that collapse eventually becomes visible to onlookers, it comes with astonishing speed because the enormities that ensue have been nurtured over a long period of time in the formation of a Toynbee proletariat within the body-politic of the disintegrating civilization. The speed of the final collapse was starkly illustrated in the modern era by the fall of the old Soviet Union, where the incompetencies of oligarchy governance were more pronounced than those of the oligarchy governance in the Western countries. It is a great error to suppose the West won anything more than a Pyrrhic victory in the competition between state-of-nature Capitalism and Communism. The Western Roman empire was the last bastion of Hellenic civilization to fall, yet fall it did. In our day, the fall of Western civilization has already begun and, if nothing effective is done to change the social circumstances occasioning it, it will go the same way as the Soviet Union and

the *interregnum* of a new Dark Age will fill the social vacuum that is left.

This is not an opinion nor is it a prophesy. It is a theorem of social-natural science. As scientific theorems go, this one is a low-hanging fruit and it takes very little effort to see the social-natural writing on the wall. What measures could be social-naturally effective for preventing the next Dark Age is a different matter altogether. Naming the date of the fall of Western civilization is likewise an empirically difficult task and presently one can only speculate. My own speculation is that some people who are alive today will witness it in their lifetimes if the trend is not effectively counteracted. The Critical questions here are: (1) what is necessary for the possibility of counteracting it? and (2) is counteraction practically possible? There is at present no scientific answer for either question. It *is* a mathematical certainty that counteracting the social trend will take some lengthy time to achieve, and it is likewise a mathematical certainty that in the embedding field dynamics of the social environment there exists some threshold beyond which nothing can be done to prevent the disintegration and collapse.

The fall of Western civilization does not necessarily imply the extinction of *Homo sapiens*, although the technology exists for bringing that about during the tumult. Most people have no idea of how little war effort could end our *Existenz* as a species. Recent estimates based on unclassified climate models say that, under some possible conditions, only *twelve* Titan II ICBMs, deployed by the United States from 1962 until 1987, could have been enough to do the job. Warhead yields today are smaller than those of the Titan II. Today it would take 25 to 35 Trident II SLBMs to accomplish the same thing [Wells (2010a), chapter 8]. One *Ohio* class submarine carries 24 of them. Such is the proximity at which our species is dancing on the edge of the grave. This consideration ought to give pause and reflection to Eastern civilization because thermonuclear winter respects no national boundaries and the innocent die as easily as the culpable. And, in any case, I have not said Eastern civilization isn't traveling the same road as the West. My opinion is: you are. We'll probably get there before you do, but you won't be far behind us. Assuming, that is, our fall doesn't kill you along with us. If it does, we'll all go together: North and South America, Europe, Asia, Africa, and Australia.

But it isn't my nature to obsess on the gloomiest possible outcomes, so let's make the happier assumption that the fall of Western civilization does not bring to an end human *Existenz*. What would things be like in that case? The hallmark characteristic of a Dark Age *interregnum* is the disintegration of large civilizations into scattered and unassociated *Gemeinschaft* Communities inter-granulated with small monarchy/oligarchy communities. Stabilization at the *Gemeinschaft* level of Community occurs because the Community *Sittlichkeit* encompasses neither state-of-nature Communism nor state-of-nature Capitalism nor the anarchy of state-of-nature liberty. The socio-economic institution that emerges tends to be civil Capitalism and the other *Gemeinschaft* social institutions tend to likewise be civil institutions.

If it were not for the competitive presence of that other hallmark of a Dark Age, the warlord tribe, a stable if arrested condition of free society could arise. It isn't likely to be sustainable because even a stupid brigand chief can and probably will instigate uncivil competitive conditions as soon as he and his *hirdmen* discover the rewards of looting and pillaging and learn how to effectively carry them out. But suppose in some region by some accident of circumstance the warlord tribe is absent. That happens. The Kalahari is a pretty good example of this. The *Gemeinschaft* society is only stable if its population remains below a relatively small threshold level and above this level it is not sustained. Given the density of human populations as they are at present, re-stabilization of social life would not occur until the number of human beings fell far enough to produce the geographic divides needed to isolate the *Gemeinschaft* Communities. The species *Homo sapiens* would continue, but the death toll during the collapse would not be counted in the hundreds of millions. It would be counted in the billions. I can't speak for you, but by my personal moral code doing nothing to prevent this is immoral and inaction is a crime. I wish I

could say everyone would hold it to be so, but in fact there are people who will compensate for any disturbance the possibility produces by type-α behavior (ignórance). They will say, "I don't believe any of this and even if it were true [either] (1) it isn't my problem"; or (2) there's nothing I can do about it." That, too, is the social-natural reality of the situation. For my part, I accept the Obligation requested of me fifty-one years ago by President Kennedy: "Ask not what your country can do for you; ask what you can do for your country." But I know there is no shortage of people who will not pledge to such an Obligation.

§ 3. Social-chemistry

I do not know if it is still possible to prevent the occurrence of the next Dark Age and stop the process of the fall of civilization now in progress. But it is a part of my personal Nature to follow the maxim (paraphrasing Dylan Thomas),

> Do not go gentle into that good night . . .
> Rage, rage against the dying of the light.
> – Dylan Thomas (1952), *Do Not Go Gentle into That Good Night*

Speculation, opinion and, least of all, hysteria cannot serve us, but science can – specifically, social-natural science.

Saying that we must bell the cat is one thing; doing it is another matter altogether. I put it to you that this treatise presents the first outline for social cat-belling. The method I propose is the idea of a mathematical science of social-chemistry. A social-chemistry graph is a mathematical structure of vertices interconnected by a set of arcs. More formally, this kind of graph is called a *network* and the arcs denote functionals defined on ordered pairs of vertices $\langle v_i, v_j \rangle$. Each vertex v_i is called a *network node* and denotes an individual person or a group of persons who cooperate with each other so closely that the group can be regarded as acting as a body.

Both the corporate person and Society are mathematical objects. Each v_i is represented by a state variable x_i, called the node activity, and the structure of the network is defined by an arc set A that defines the connectivity of the graph and the connecting functionals $\alpha_{i,j}$ that mathematically define the effects activity x_i in node v_i have on the activity x_j in a node v_j. The arc set is defined as a set of functionals because the arc between any two nodes can actually consist of a set of divers functions, each representing some specific interaction factor that partially determines how the activity of v_i affects the way v_j responds. (Such a graph is formally called a multigraph). The overall graph is called the *social molecule* and the subset of nodes $v_j \in V_i$ connected by arcs to v_i is called the *personal molecule* of v_i.

A social molecule represents the general social environment of a population of human beings and social chemistry is the mathematical theory of social molecules. Specifically, the mathematical theory is called embedding field theory [Grossberg (1971)]. Chapter 9 discussed, without going into mathematical detail, basic principles and factors involved in constructing a social-chemistry model. The mathematical details are covered in depth in the Grossberg corpus (see the general references at the end of this treatise). The new mathematical principle mental physics adds to Grossberg's original formulation is: mathematics of social chemistry must comply with Slepian's principle and clearly distinguish between principal and secondary mathematical quantities in a set-membership formulation of the mathematical description (chapter 3).

An embedding field model of a corporate person must include embedding field models of its environment, including models of other corporate persons who may exist in it and interact with the corporate person. Furthermore, the nodes representing our social atoms (the individual persons) are themselves generally non-trivial model systems. Factors pertinent to making a social

molecule model include the synthesis of individual motivational dynamics, representation of the individuals' Semantic sets during social interaction, individual personality circumplexes, and the individuals' manifolds of rules. All of these are in addition to the factors of Kiesler's interpersonal circle (chapter 8).

It probably seems pretty obvious that the computational complexity of such a model can rapidly become, to put it mildly, daunting. This practically necessitates that the theorist adopt the hierarchical approach discussed in chapter 9 (§3) and employ Grossberg's method of minimal anatomies. It likewise practically necessitates a well-integrated ladder approach of multiple levels of scientific reduction with complementary model order reduction rules for moving between the rungs of the modeling ladder (chapter 2). I'm sorry to say that this – what I regard as the core of the science of modeling complex systems – is a mathematical methodology not as widely understood among professional system theorists as the problem of social-natural science requires. With undergraduate level training, any competent student of engineering can be taught how to construct and use models of simple systems. Modeling theory as a discipline does not really show off the principles of its doctrinal methodology until one reaches the realm of very large and complicated systems. At this level, control of computational complexity requires the modeler to use a hierarchical *modeling system* based on derived *describing functions* [Atherton (1982)].

I am sorry to report that the majority of practicing theoretical modelers err in the early stages of their model development by pre-simplifying their models based on Platonic arguments about what factors they expect to be "negligible" in the model dynamic and eliminating them before they begin their actual modeling analysis. An experienced scientist or engineer can do this more or less reliably when the system being modeled is a simple one, particularly if its dynamics are linear dynamics. The reliability of this prejudicial approach rapidly vanishes as soon as the system becomes more complex or when nonlinear dynamics become involved. It is at that point where the ladder-like organized methodology becomes paramount. I first became involved in modeling work of this sort thirty years ago. Indeed, developing a methodology was a central part of my doctoral dissertation [Wells (1985)], although I had not originally set out to develop a new methodology when that research project began. It was something I found myself doing by practical necessity as the work progressed. I am not the originator of such a structured approach – Grossberg beat me to that mark by over a decade – but I think I can modestly claim that I was among the first to recognize that the method *essentially* involves climbing up and down the ladder of scientific reduction/model order reduction. (Grossberg has a pretty fair claim to being first here, too, and if he wants to argue the point I'll concede it to him). A brief excerpt from Wells (1985) illustrates the methodological idea for a specific case (magnetic recording):

> It was argued that modeling of the magnetic properties of the recording medium must be done at the physical scale of the recorded magnetic transitions rather than at the scale of the bulk properties of the system. [A] phenomenological model of the recording medium was posited based upon the experimental observation that the fundamental magnetic structure at the scale of the recorded transition is the cluster domain. The isothermal quasistatic behavior of the material was phenomenologically developed from thermodynamic principles . . . At the micromagnetic level, the hysteresis loop characteristics of the recording material were modeled using the ensemble average behavior of small sets of interacting clusters. An easily computable set of describing functions was presented based on curve fitting to the micromagnetic hysteresis loops. The parameters of the basis function can be determined from measured bulk hysteresis curves. . . . The micromagnetic properties of the recording material were combined with demagnetization effects . . . to achieve a new self-consistent recording model at the macromagnetic scale. This model is enormously more computationally efficient than a pure micromagnetic model would be and does not suffer from the effects of model graininess that afflict previous recording models based on micromagnetics. [Wells (1985), pp. 204-205]
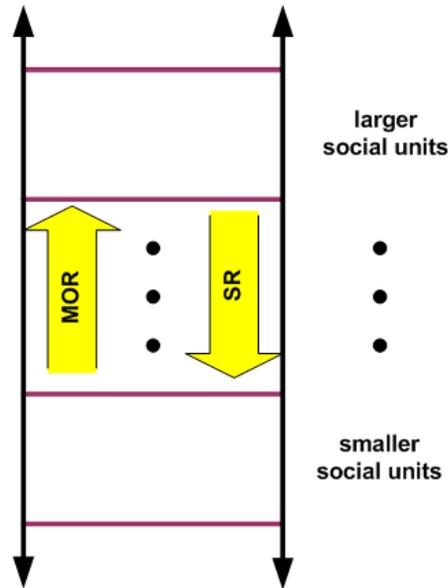
Figure 14.3: Scientific ladder of modeling levels. SR = scientific reduction; MOR = model order reduction.

The details of the physics in this example aren't particularly important to our topic here. The essential idea is that mathematical methods can be (and must be) developed that facilitate not just a single model calculation/analysis but, rather, a linked series of such modeling calculations gradually ascending the phenomenal ladder (figure 14.3) to the level where the macroscopic phenomena of interest are displayed. This idea of a *linked series* of models, employing functions developed at the next lower level of modeling, is not something Grossberg explicitly mentioned when he introduced the method of minimal anatomies in the early 1970s. The method is one I have used extensively for thirty years in many applications ranging from engineering – e.g. McCarthy & Wells (1997), Yi, *et al*. (2002), Yi, *et al*. (2003), Vongkunghae *et al*. (2003), Yi & Wells (2004), Carlson *et al*. (2005), Yi & Wells (2006) – to neurobiology [Wells (2010b)]. I now propose it as the base methodology for mathematical social-chemistry.

§ 4. The Formal Definition of a S̲o̲c̲i̲e̲t̲y̲

A society is something personal inasmuch as each person makes his own society by the bonding relationships he forms with others. The individual's society is an ephemeral that begins and ends with the individual person. It subsists in his concept of it as something: (1) suitable for his purposes; (2) having its principal quantities represent appearances of other individuals; (3) having no ontological significance whatsoever; and (4) in its logical essence, being nothing else than a concept of relationships and associations.

Where many individuals come to adopt similar enough common aims and expectations, when their social intercourse is marked by intersections of the individual societies of each, when the mathematical description of the social relationships of the group forms the type of mathematical structure mathematicians call a *topological space*, there we find what Toynbee called "the product of the relations between individuals, and these relations of theirs arise from the coincidence of their individual fields into a common ground, and this common ground is what we call a society" [Toynbee (1946), pg. 211]. This common-ground-we-call-a-society is a Critical Society. The Object of Society is understood as a higher, abstract concept of divers individual concepts of society. This higher concept retains what is common among these divers concepts of society while excluding peculiar individual differences.

Formally, if we let x denote a particular individual's society and let X denote the set of all the individual x-societies, then a Society is a subset $X \subset X$ combined with a topology $\Im$. This is formally denoted by writing it as $(X, \Im)$. An individual *social neighborhood* is a set of societies U_x belonging to people in a particular person's society[1]. Let U_x and V_x denote different specific neighborhoods associated with a particular individual society x. A *system of neighborhoods*, $\boldsymbol{u}_x$, is a set of neighborhoods defined such that three formal conditions are met:

1. if any V_x is such that V_x is a superset, $V_x \supseteq U_x$, of some $U_x \in \boldsymbol{u}_x$, then $V_x \in \boldsymbol{u}_x$;[2]
2. if U_x and V_x both belong to $\boldsymbol{u}_x$ then the intersect neighborhood $U_x \cap V_x$ belongs to $\boldsymbol{u}_x$;
3. if U_x belongs to $\boldsymbol{u}_x$ and there is some V_x belonging to $\boldsymbol{u}_x$ containing a society y belonging to V_x, then neighborhood U_x belongs to the neighborhood system $\boldsymbol{u}_y$ of another person (person-y).

A topology $\Im$ is an assignment of neighborhood systems comprising a set $\{\boldsymbol{u}_x$ such that $x \in X\}$. The Society is the topological space $(X, \Im)$.

§ 5.   Emergent Characteristics of <u>S</u>ocieties

A Society as formally defined in §4 can be mathematically represented by an embedding field graph model (a network) of its social chemistry. Now, mathematical topologies $\Im$ and topological spaces $(X, \Im)$ are not unique. Mathematicians define them, according to the rules specified above, to suit some particular purpose the mathematician has in mind. The phenomenon of a Society has the peculiar property that it is an emerging feature of social interactions that forms, not according to any particular notion of society held by any particular individual but, as the consequence of the mass social interactions taking place among individuals. This is governed by the dynamics of the embedding field, and where cooperative interaction phenomena arise, there form Societies. Societies are accidents of human interactions. It would not be erroneous to say that Societies are living instantiations of spontaneously-forming topological spaces. In this context, the dynamics of this spontaneous characteristic of an embedding field graph model can be called ***social-physics*** and social-natural sociology is then the study of social-physics.

It has long seemed strange to me that, while mathematicians have put considerable work into studying the mathematical properties of *given* topological spaces, they have apparently not put any work into the study of the *generation* of topological spaces. At least, I personally know no mathematician who has told me that a mathematical topology-generation theory exists. Yet there is no possible doubt that topological spaces can be generated because mathematicians do it all the time. Perhaps topology-generation is a topic too empirical to suit the tastes of a generation of professionals trained into the bankrupt Platonic habits of formalism we owe to the Bourbaki movement from 1939 into the 1960s?[3] Be that as it may, I think there is ripe mathematical fruit

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[1] The notation U_x is pronounced "neighborhood U of society x."

[2] The notation A $\in$ B is pronounced "A belongs to B."

[3] Nicolas Bourbaki is the pseudonym used by a group of mathematicians – a group it would not be out of place to call "the young Turks" of the mathematics community – who were the standard-bearers of what some call the Structuralist Movement in mathematics. Among other things, the Bourbaki movement was responsible for the introduction of so-called "new math" in U.S. elementary schools in the 1960s. The principal effect of this movement on mathematics education in the U.S. has been to render the United States a country profoundly ignorant of mathematics. Why can't Johnny do math? Thank Uncle Nick. Like all mass reform movements, the Bourbaki movement was founded upon an implicit philosophy and, also like mass reform movements in general, this implicit philosophy was based on a disorganized hodgepodge of pseudo-metaphysics. Again, any metaphysic is "the way one looks at the world." If you think that meta-

here for the picking in this intriguing mathematical question.

An embedding field graph modeling the social environment of a sizable group of individual persons will, likely enough, tend to often exhibit the emergence of not just one Society but rather a plurality of Societies, some of which will be in non-cooperative competition with each other. If, however, over time one finds adaptations of topological spaces taking place such that the number of persons cooperating in a common Society (the cardinality of the Society) is increasing, this is nothing else than a perfecting of an evolving *Volks*-society. As the degree of cooperation among increasing numbers of people increases, we can call this a *process of civilization*. Seen in this context, the proper Critical context of the term "civilization" is *the act of making civil*. It is not ontologically correct to regard "civilization" as a substantial thing. It is an *Unsache*-thing, a "happening" – in other words, an orientation and trend in social dynamics.

This is why Toynbee failed to be able to define it and was unable to find a valid way to distinguish between "civilization" and so-called "primitive society." ***Civilization is the process of perfecting* Volks-*society***. When this process produces greater robustness and stability in cooperation among larger numbers of individuals, this is ***civilization genesis***, the Object of a positive general effect of civilization. When the process decreases robustness, decreases stability, and produces in greater degree more internecine competition among the members of a Society, this is ***civilization disintegration***. ***Civilization arrest*** is the equilibrium in which civilization genesis and civilization disintegration mutually negate each others' effects. Civilization genesis, civilization disintegration, and civilization arrest are all emergent properties of social-physics.

The idea of "primitive society" has objective validity only as the idea of a comparison between two Societies in terms of their relative perfecting of *Volks*-society. Natural society is more primitive than free society, and free society is more primitive than ideal society (in the context of Santayana's usage of these terms). Seen in this way, the idea of primitive society has for its Object nothing other than a relative ranking of compared states of civilization progression. In this sense, it is an objective evaluation of the relative perfection of civil *Sittlichkeit* in two or more Societies.

Governance, viewed from the theoretical Standpoint of Critical epistemology, is the form of leadership dynamics exhibited in a Society by mutually co-determined Self-regulation of individual's action expressions during civic interactions. ***Government*** is the system of institutions formed by the 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 and Progress. Social-natural political science is the empirical natural science of government.

The real possibility of Society is grounded in phenomena of social compacting and the making of social contracts. In all such actions, each individual's Self-determination to commit himself to acceptance of mutual Obligation and the performance of reciprocal Duties is ultimately based on his personal tenets of Duties-to-Self. All such Duties, in one way or another, are directed purposively to the perfecting of his *Personfähigkeit*. Lack of what is practically needed for a person to realize a state of satisfaction in his situation is called ***unwealth***. ***Wealth-in-general*** is that which is not-unwealth. A ***wealth-asset*** is any good for which its use negates unwealth. A *health* wealth-asset is a wealth-asset the use of which perfects a person's physical power. An

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physics does not function to guide what human beings do, there's something very important about human Nature you are not understanding. If the behaviors of people are mentally governed by discordant individualistic systems of pseudo-metaphysics, it should come as no surprise that discordant idiosyncrasy should be the outcome product. If you are a teacher of philosophy and you don't understand that meta-physics has real consequences for real people, then shame on you.

education wealth-asset is a wealth-asset the use of which perfects a person's intellectual power. A *political* wealth asset is a wealth-asset the use of which perfects a person's persuasive power. An *economic* wealth-asset is a wealth-asset the use of which perfects a person's tangible power. Social-natural economics-in-general is the empirical natural science of the production, distribution, and consumption of assets of wealth-in-general. Because each of these species of wealth-asset pertains immediately to the Duties-to-Self that motivate the individual's Self-determination to enter into social compacts, social-natural economics can be aptly described as a natural science of conditions of social contracting.

One important facet of social contracting lies in the intersection of social-natural economics and social-natural political science. This facet is the context of civil rights. A part of this context is the notion of "property," which I stated in chapter 11 was an idea belonging to the general context of civil rights, and which can be regarded as an intangible civil rights property. Another idea closely related to the idea of "property" is the idea of "ownership." Both of these ideas have objective validity *only* in the context of deontological ethics. This is an important subtopic, but still a subtopic, of the theory presented in this treatise. The deontological theory of ownership and property is something I have previously presented in Wells (2010a), specifically in chapter 7, §3 of that work. As this is a subtopic of the present treatise, I will refer the interested reader to that work for its more detailed treatment. To that discussion I will add here only the comment that Montesquieu's remark, quoted earlier, regarding adapting laws to fit the people to whom they are applied is part of the relevancy to this point in the intersect of social-natural political science and social-natural economics, and that this maxim of Montesquieu is likewise pertinent to the design of institutions of Tocqueville governance, i.e., to the realization of an American Republic.

Societies can and do form spontaneously without the requirement of their members being cognizant of, much less well-educated in, any idea of a social contract. The most primitive degrees of civilization do not require a distinct and clear idea of a social contract at all. However, the evolution of any Society towards perfection as an ideal society does require that its members all adequately understand citizenship, Obligation, social Duty, civic behavior, and civil behavior. While vagueness and lack of clarity in regard to civic duties and civil rights is not necessarily an impediment to the development of mores and folkways in a Society, they can also be sources of civil strife and civilization disintegration. This is because issues of civic behavior, civil liberty, and civil rights pertain immediately to the isomer-like function in social-chemistry.

A group of people can be forced into a community by a despotic action. If small children were capable of understanding things in more abstract terms at that stage of their lives, many would regard being "made to go to school" as a form of despotism. One sees this reflected quite often in children's remarks about school. The mere fact that a group of individuals might be forced into such a situation in no way prevents them from – it quite likely, in fact, encourages them into – forming their own Community, and not necessarily the sort of Community those who coerced them into the social relationship had in mind. For example, a teacher might *assign* a group of pupils to constitute some team or group. The common purpose served by their obedience to the edict might merely be a pragmatic or prudential aim to avoid getting into trouble by disobeying the teacher. But the group can evolve into a civil Community beyond or outside the intent of the teacher if the pupils find common causes for forming their own civic bonds and cooperative behaviors spontaneously arise. Many a trip to the Principal's office has resulted from this. Welcome to Kid World, Ms. Pilniewinks.

§ 6. Institutional Practices for the Advancement of Society

The necessity of developed tastes for principles of civic cooperation is the reason children cannot be citizens of the Community. To be a citizen means to have knowingly pledged oneself to

reciprocal Obligations and to have agreed to the performance of certain civic Duties to the Community. Children lack the knowledge of experience necessary for the possibility of being able to faithfully make such a pledge or to understand what it is they are pledging. Until they have achieved the cooperation stage of development of moral judgment, there is no possibility of them even being able to grasp maxims of Community Duty and Obligation or to understand that citizenship always comes at the price of fulfillment of Duties to the Community. In many and perhaps even in most countries, *legal* citizenship is granted to the individual as a so-called birth right. Deontologically, there is no such thing as a birth right. A merely legal citizen who thinks his Community owes him something because of the accident of his birth and that he owes nothing in return to his Community is an ***entitlement citizen***. To be an entitlement citizen is to be an outlaw. An association comprised only of mere entitlement citizens might be a community but it is not a civil Community.

Left to their own resources, children's developed maxims and tastes for social cooperation are grounded entirely in their personal experiences during the social commerce of life in Kid World. You can teach a person to chant a pledge of allegiance or parrot an aphorism, but if there is no developed commitment to Obligation behind it, no assumption of Duties but merely social compliance as *actio involuntaria*, all such chants and parroting are empty. Experience provides us with the empirical demonstration that tastes for cooperative social intercourse as these develop in Kid World are sufficient for the formation of a natural society, and in some but by no means all cases can even produce the association of a free society if the habitual mores and folkways of the social environment are conducive to it. But these naturally-developing maxims are in no way sufficient for or conducive to social Progress towards an ideal society.

All children begin life as social outlaws and naive realists. Many adults remain naive realists, and in many countries today they also remain social outlaws rather than deontological citizens. Citizenship is a moral commitment; specifically, it is a commitment to a social contract. The empirical nature of the social environment is a competitive nature, and the degree of cooperation needed to support a stable Society, even a primitive one at the level of a natural society, is not guaranteed to emerge from the social dynamic. But a Community can, in a manner of speaking, "load the dice" by biasing the educational circumstances children experience through a process of ***liberal public education***, by which I mean *a system of education designed for the purpose of developing children's personal tastes and tenets of cooperation* in such a way as the civil Community deems desirable. Such a system is *public* because *it serves the general welfare of the civil Community*, not because it is open to all persons. It is *liberal* because what it teaches are the principles of *civil liberty, civic Duty, and civil rights*. It is, in other words, the education of children on the topic of the social contract. Liberal public education is a social institution that any nation and any civil Community wishing to achieve Progress towards becoming an ideal society must institute. Educator Robert M. Hutchins wrote,

> The aim of liberal education is human excellence, both private and public . . . Its object is the excellence of man as man and man as citizen. It regards man as an end, not as a means; and it regards the ends of life, and not the means to it. For this reason it is the education of free men. Other types of education or training treat men as means to some other end, or at best are concerned with the means of life, with earning a living, and not with its ends.

> The substance of liberal education appears to consist in the recognition of basic problems, in knowledge of distinctions and interrelations in subject matter, and in the comprehension of ideas.

> Liberal education seeks to clarify the basic problems and to understand the way in which one problem bears upon another. It strives for a grasp of the methods by which solutions can be reached and the formulation of standards for testing solutions proposed. The liberally educated man . . . understands, by understanding the distinctions and interrelations

of the basic fields of subject matter, the differences and connections between poetry and history, science and philosophy, theoretical and practical science; he understands that the same methods cannot be applied in all these fields; he knows the methods appropriate for each.

The liberally educated man comprehends the ideas that are relevant to the basic problems and that operate in the basic fields of subject matter. . . . The liberally educated man has a mind that can operate well in all fields. He may be a specialist in one field. But he can understand anything that is said in any field and can see and use the light that it sheds upon his own. The liberally educated man is at home in the world of ideas and in the world of practical affairs, too. [Hutchins (1952), pp. 3-4]

Personally, I know many people who call themselves "liberals"; I know not more than a very few people who *are* deontologically liberal. In terms of civil Community, the great majority of so-called liberals I know personally are nothing of the sort; they are anti-social despots thoroughly bereft of true liberal education. Just to be balanced in my presentation, I also know many people who call themselves "conservatives"; very few of them are really conservatives – reactionaries is a far more accurate label – and the great majority of them are anti-social outlaws. People in the first group find being labeled as despot gravely insulting; people in the second feel the same way about being labeled outlaws. Yet that is what their illiberal education and developed anti-social tastes have brought them to make of themselves. I don't feel sympathy for either group; I protect myself from their predations. America today is not a free society, although long ago it was; it is a natural society undergoing a disintegration its people do not know how to stop.

Civics education is the beginning of liberal education. Civil education is likewise a part of it, but the first must necessarily precede the second. It cannot be taught in a single course but, rather, requires a systematic institution of education begun in elementary school and continued into the trade school, community college, or university levels and beyond. Focusing here only on civics education, civics education cannot be well-effected if the pedagogy fails to account for diversity in the personality/social styles circumplex. Civics textbooks, I think, must be crafted separately for the four principal social styles (Driver, Analytic, Amiable and Expressive), but all style versions must aim at educating the pupils past the egocentric stage in the development of moral judgment and establish a general taste for accommodation to others' styles. Accommodation to others' styles is indeed the foundation for civic cooperation. Historical teaching practices grew out of the practices of the old Medieval *trivium* and utterly fail to account for the personality circumplex. Pupils, especially very young ones, *cannot* accommodate themselves to suit the style of the teacher or textbook author. If they could it would be unnecessary to *teach* them how to accommodate the styles of others. Teachers and authors, then, *must* be the ones who make accommodations to the level of social development of the target group of pupils.

It is wrong to think that the public institution of education is the sole repository of civic and civil education. There is in addition a *practical* contribution, either to the benefit or disbenefit to the civil Community, made by all other institutions of government at all levels of government. This is so regardless of whether the people of a Community or a nation wish it to be so or not. All civil and civic cooperation behaviors are ultimately grounded in interpersonal bonding relationships; uncooperative behaviors are grounded in the absence of bonding relationships and in interpersonal anti-bonding relationships. The institutions of any government can *and will* promote either the one or the others. A civil Community is always a deontologically moral Community, and institutions of government can be either instruments of Order and Progress for moral Community or they can be antagonists of it. What they *cannot* be, what it is *socially impossible* for them to be, are *non-contributors* to the one or the other. Mill wrote,

We have . . . 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 advance 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 action upon men, and by its action upon things; by what it makes of the citizens, and what it does with them; its tendency to improve or deteriorate the people 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 . . .

The difference between these two functions of government is not, like that between Order and Progress, a difference merely in degree, but in kind. We must not, however, suppose that they have no intimate connection with one another. The institutions which ensure the best management of public affairs practicable in the existing state of cultivation tend by this alone to the further improvement of that state. A people which had the most just laws, the purest and most efficient judicature, the most enlightened administration, the most equitable and least onerous system of finance, compatible with the stage it had attained in moral and intellectual advancement, would be in a fair way to pass rapidly into a higher stage. . . .

Of the two modes of operation by which a form of government or a set of political institutions affects the welfare of the community – its operation as an agency of national education, and its arrangements for conducting the collective affairs of the community in the state of education in which they already are – the last evidently varies much less, from difference of country and state of civilization, than the first. It also has much less to do with the fundamental constitution of the government. . . . It is true that [doctrines of the practice of government[4]] could not be applied without some modifications to all states of society and of the human mind: nevertheless, by far the greater number of them would require modifications solely of details, to adapt them to any state of society sufficiently advanced to possess [agents of governance] capable of understanding them. A government to which they would be wholly unsuitable must be one so bad in itself, or so opposed to public feeling, as to be unable to maintain itself in existence by honest means[5].

It is otherwise with that portion of the interests of the community which relate to the better or worse training of the people themselves. Considered as instruments of this, institutions need to be radically different, according to the stage of advancement already reached. . . . And the one indispensable merit of a government, in favor of which it may be forgiven almost any amount of other demerit compatible with progress, is that its operation on the people is favorable, or not unfavorable, to the next step which it is necessary for them to take in order to raise themselves to a higher level. [Mill (1861), pp. 20-22]

Every public institution of every kind, whether an agency of government proper, an institution of public health such as a public hospital, an institution of a public school system – *every* public institution of every kind is a political institution. The justification for its existence and public support is predicated on an expectation of authority vested in it by the citizens for the realization of the social contract of that Society.

There enters into the topic at this point a basic fact of the human Nature that the planning and instituting of all public institutions must take into account. This is the presence of a manifold of

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[4] Mill actually wrote "rulers" here, but that is a contradiction of his thesis. Rulership is antagonistic to civil Community.

[5] Dishonest means would be the uncivil tyranny of monarchy/oligarchy – the rule of the majority by a minority. Oligarchy government is the present style of governance in the general government of the United States and in its fifty states. It wasn't always so, but it is today. The fact that no other major country on earth is ruled otherwise does not excuse the practice. Rulership is antagonistic to civil Community and protagonistic to civil breakdown no matter how it is implemented.

mini-Communities within the larger Community-as-a-whole. All institutions of civil Community governance must be cognizant of this fact. A civil Community is both a cooperative Community and a deontologically moral Community. All cooperative behaviors are grounded in social bonding relationships that develop between individuals and mini-Communities of individuals. All non-cooperative behaviors are potential sources of social breakdown and the granulation of a civil Community. Breakdown is grounded in anti-bonding relationships. This fact is one reason why the simple-minded notion of selecting agents of government based strictly upon popular voting by election districts is flawed. Every citizen is a member of multiple mini-Communities, and these mini-Communities each have their corporate interests that must likewise be represented if anti-bonding competition between mini-Communities is to be forestalled or its general impact on the whole Community moderated.

Furthermore, the form of governance suited for a particular mini-Community will differ because the social contract terms of each mini-Community generally differ from those of the Community-at-large. Society develops with and because of the development of the tastes of its citizens, and no single approach to public governance is suitable in all cases. Nor is it true that all laws and government regulations are suitable as universal rules applicable to one and all without modification or difference. They could only be so in application to abstract people, where the abstraction is made of their individual differences and circumstances. But there are no real abstract people in a Community or a nation. It is for this reason that a system of governance capable of maintaining sustained Order and Progress in a Society must be instituted according to the principle of Tocqueville governance. Every other approach known to history has met with the same fate: eventual breakdown and the disintegration of the civilization it was meant to serve.

All of this, then, is the Meaning, importance, general interest, and significance of the Idea of the Social Contract. This treatise has treated the Idea. What remains to be done is to develop the social-natural sciences properly and apply them to the problems and challenges of humankind.

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