# Chapter 11 Details of Epochs $M_1$ to $M_4$

## § 1. Mini-Communities, Factions, and Models

The central, chronic, and principal challenges facing every Society are: (1) achievement and maintenance of cooperation and social-chemical bonding between mini-Communities for promotion of the general welfare; and (2) so far as is possible within the restrictions of justice placed on citizens in the Society by its social contract, prevention of destructive social-chemical antibonding competitions among factions. A mini-Community is said to exist whenever two or more persons form reciprocal social-chemical bonding relationships. Factions are said to exist whenever mini-Communities form reciprocal social-chemical antibonding relationships with each other. Mathematically, every Society can be regarded as a complex social-macromolecule of interacting mini-Communities and mini-factions. Out of the many complicating social factors that are present in every Society, two especially demand foremost notice. The first is that *every person in a Society self-defines his own personal society and the mini-Communities that comprise it*. The second is *every person in a Society is simultaneously a member of multiple mini-Communities*. A third factor, barely less important than the first two, is: *in every Society with a population large enough that not every person knows every other person, for each individual most persons in that Society are not members of his personal society* and he knows them as stereotypes, not persons.

I have previously proposed the Idea for a mathematical approach to social-natural science aimed at understanding and dealing with these and other factors [Wells (2012a), chap. 9]. I have named this approach ***social-chemistry***. At the time this is being written, this new science is in its fetal stages. Nonetheless, its qualitative modeling ideas are sufficiently far along in their development to be of present use in this treatise. The social-chemistry of a Society – as I'm sure I need not tell you – is clearly a very complicated mathematical problem and it is beyond reasonable doubt that the science faces a great number of important basic questions and issues to answer and overcome. However, exactly the same thing is true of the science of solid state physics and chemistry yet no scientifically informed person will doubt the fecundity and practical importance of these sciences. The Idea of social-chemistry shares many points of close analogy and metaphor with solid state physics and chemistry, and these mathematical ideas do provide a starting point and direction for future developments in the new science. In this chapter, I make use of some of these, at a qualitative level of model-making, in application to the general problem of social-natural public education. In particular, I use these ideas to bring out the issues of mini-Community and mini-faction that emerge from the macroeconomic Enterprise-protein character of U.S. Society.

Human beings, each regarded in his *homo noumenal* character of being-a-human-being, are the social atoms for every social-natural science. In their liberties of action they are the causative agents in every social phenomenon. In all but the most trivial cases, no one human being is what physicist Henry Margenau once called a "total cause," but the individual nonetheless is a causal factor when viewed as what Margenau termed a "partial cause" of a phenomenon. He wrote,

> In summary, then, a cause becomes unique when it refers to a stage in a process involving the whole system under consideration. Or, to put it in terms of our previous analysis, it becomes unique when it refers to the entire *state* of a physical *system*.
>
> The reason why the causal assignment of the first examples in our list was somewhat indefinite is that the causes did not embrace a sufficiently large situation. They were what we shall henceforth call *partial causes*. To illustrate the difference between partial causes and *total cause* we consider again Example 2. John, gun, bullet, anger are all partial causes; the total cause is a situation describable in this way: Harry is alive; John is angry and holds a loaded gun, etc. The total effect would be: Harry is dead; John holds an empty gun, etc.


**Figure 11.1:** Illustration of a personal society self-defined by Person P. P's personal society is comprised of individuals he groups into divers mini-Communities and mini-Societies with whom and which he interacts with social-chemical mutual bonding relationships (depicted by blue connections). Typical examples include family, religious group, his workplace, etc. as illustrated in the figure. These taken *in toto* by Person P (large yellow circle in the figure) make up P's personal society. Also in P's social environment are typically found one or more actual or corporate persons with whom P has formed anti-bonding relationships (depicted by the red connection). These persons he actively excludes from his personal society. Lastly, his social environment contains a vast number of other persons he either does not know or has no particular affinity or antagonism towards. This great pool of other people is not part of P's personal society, but neither are the individuals covered by it necessarily excluded by him from being embraced by his personal society at some later time. His interactions with them are termed neutral interactions.

> Let it also be observed that a given total effect has an infinite number of total causes distributed through a temporal sequence, but only one total cause at any given instant. Every frame of a movie film picturing the murder presents a cause of situations presented on later frames. . . .
>
> One final inference is to be drawn from our list of causal instances. All examples have this in common: the cause precedes the effect in time.
>
> When the conclusions noted thus far are compounded, the principle of causality asserts the following: Let $A$ and $B$ be complete states of a specified system at times $t_1$ and $t_2$, $t_1$ being earlier than $t_2$. If $A$ is realized, $B$ will certainly follow. . . . [It] may happen that no system can be found with reference to which causal analysis can be conducted. Clearly, if we were driven to choose the entire physical universe or all of experiences, we should count our causal investigations as failures. Or it might be that a system is patently given but that to define a state in a causal fashion is impossible. If and when these results occur, we do not readily abandon causal description; we endeavor to redefine systems and states. Hence, while the principle has positive content, it appears nevertheless in the role of a metaphysical maxim. [Margenau (1977), pp. 393-4]

Margenau speculated that the sciences of biology and psychology would some day find themselves confronted head on with the requirement of dealing with partial causes. His remark, first made in the 1950s, seems to have been prophetic. It is beyond all reasonable doubt that dealing with partial causes is a fundamental requirement for social-natural sciences. Social-chemistry is precisely a step in this direction.

As a starting point I take the human-natural phenomenon of the individual self-defining his

own personal society. Figure 11.1 provides a qualitative illustration of an example of the phenomenon. Specific self-definitions of societies are, of course, specific to the individual who defines them. The figure is intended to illustrate a fairly typical set of definitions. Most people appear to define for themselves some, and sometimes all and more, of the following:

- a mini-Community consisting of family members;
- often, a mini-Community comprised of people who share the individual's particular religion if the individual belongs to a church and is active to at least the extent of more or less regular church attendance;
- a mini-Community of co-workers at the individual's place of occupation, assuming he holds a job or is an owner-proprietor who employs other people;
- an occupational mini-Society – or, sometimes, several such mini-Societies – if the individual's occupation has one; this might be a union in the case of a wage-earner entrepreneur, a professional organization if the individual is, e.g., an engineer, a dentist, a medical doctor, a lawyer, etc.; if the individual is a prominent local business person, he or she might be a member of a junior chamber of commerce or belong to a private club whose membership is comprised of other prominent local business persons;
- a residential mini-Community comprised of his neighbors and fellow townspeople with whom he conducts his purchase-for-consumption activities; and
- a mini-Community of friends with whom he spends some of his leisure time and who share with him some of his recreational activities and interests.

You might find it interesting as an exercise to sketch out in a similar fashion your own network of mini-Communities and mini-Societies that make up your own personal society. Some people typically will belong to more than one of an individual's set of distinguishable mini-Communities – e.g., a person's son is a member of his family mini-Community but might also belong to one of the person's recreational mini-Communities if the two frequently share father-son activities – but it is unlikely that any person (except, of course, Person P in the figure) belongs to all of Person P's mini-Communities. Likewise, Person P simultaneously belongs to multiple mini-Communities whose memberships might sometimes overlap but which rarely overlap completely. Furthermore, the memberships of these mini-Communities are usually fluid, with new people entering into them and other people dropping out of them from time to time.

Most people also define for themselves abstract (mathematical) mini-Communities in which the individual regards other people as stereotyped or abstract people. Probably the most common examples of this are the person's nation – e.g., "I am an American" – his state – e.g., "I am an Iowan" – and his town – e.g., "I am a New Yorker." Oftentimes people see their churches in this sort of dual fashion, consisting on the one hand of the real people who attend his local parish and on the other hand of people in the abstract sense, e.g., Catholics, Lutherans, Jews, etc. For some idealistic people, "the brotherhood of man" fills this role. These cases differ from those of the individual's actual mini-Communities (those with whose members he has direct interactions) primarily by the fact that the individual does not know everyone he associates in his mind with his abstract mini-Communities and he likewise has never and will never meet most of them.

What the other members of a person's mini-Community share with him is some set of common interests that generally distinguish each one of his mini-Communities from his others. Each of his mini-Communities will likewise adhere, at least according to the defining individual's expectations for that mini-Community, to some form of social contract. Often this is a tacit form of contract that makes its appearances in the common customs and folkways of the group. In this case, which is the most frequent one, other people in the person's mini-Community will each have their own private ideas about what sort of social contracting binds them together as a group. Formal statements of social contract are usually found only in cases of abstract mini-Society organizations, and these statements usually comprise part of the mathematical definition of the

abstract mini-Society. For example, before I retired I belonged to a professional society that required of its members that each pledge himself specifically to certain Duties. Hanging on the wall of my study is a framed copy of this pledge. It reads as follows[1]:

> *As a Professional Engineer, I dedicate my professional knowledge and skill to the advancement and betterment of human welfare.*
>
> *I pledge – :*
> *To give the utmost of performance;*
> *To participate in none but honest enterprise;*
> *To live and work according to the laws of man and the highest standards of professional conduct;*
> *To place service before profit, the honor and standing of the profession before personal advantage, and the public welfare above all other considerations.*
>
> *With humility and with need for Divine Guidance, I make this pledge.*

Outside the social circle each person draws around himself stands the rest of humankind. Of this much greater number of people, the person usually makes a practical if not conscious division between (1) persons (both real and corporate, actual and abstract) with whom he lives in a more or less chronic state of enmity; and (2) everyone else, who he rarely thinks about at all. In the first case, reciprocal social-chemical antibonding relationships become established. Not infrequently these relationships lead to destructive competitions between them, whereas any competitions that happen to take place within the circle of the person's society tend to be non-destructive and often constructive. For instance, there would be little point in belonging to a city league softball team if there were no softball games (even if these are just an excuse to gather for pizza and beer later).

Ontologically, a person's personal society is a mathematical object. This means its *Existenz* is entirely part of the mathematical world of supersensible objects the person represents with his ideas. The idea of this object obtains its objective validity from the direct correspondents – people – with whom the society-defining person interacts and obtains his accidents of social experience. This is because the person ***makes*** his own society-Object, and ***all made Objects are always and only mathematical Objects***. This is because the object as a thing-in-itself is beyond the horizon of actual (sensuous) personal experience. "The Universe" is an example of such a thing: You will never in your life have a sensuous encounter with any absolutely-everything-there-is.

In strict technical context, my society is ***real to me*** because I *use* its idea to classify, categorize, and understand actual sensuous experiences, involving actual people and events, in my manifold of concepts. To ***you*** the object *I* call "my society" is a *non-real* object because there is no possible context in which you can connect *my* Object immediately in your own sensuous experience. On the other hand, to you *your* personal society is a real object, but to me your personal society is non-real. What both of us can come to objectively agree upon is merely this: neither my society nor yours is ***un***real. We can *both* find contexts by which we come individually to our own understandings of both these objects. Again, *all real meanings are practical*.

[1] This is the Engineers' Creed adopted by the National Society of Professional Engineers in 1954. Since this Creed happens to be serving as an example at the moment, I will take the opportunity to point out that the Creed would be much better off without its last line. Some members of the Society are in fact atheists who acknowledge no such thing as "divine guidance." Others lack the humility to admit they need guidance of any sort from anyone. The line places some of the Society's members in the position of making a false pledge at the very onset of their membership with no tangible or intangible benefit to the Society. The line is one example of the many ways a Society can build self-destructive factors into its social contract. Oath breaking is a very bad way to start things off because once a Society demonstrates it is willing to let its members violate one part of their Oath, the other parts of it are jeopardized as well and in time the Oath itself becomes nothing but an empty and meaningless ritual taken seriously by no one.

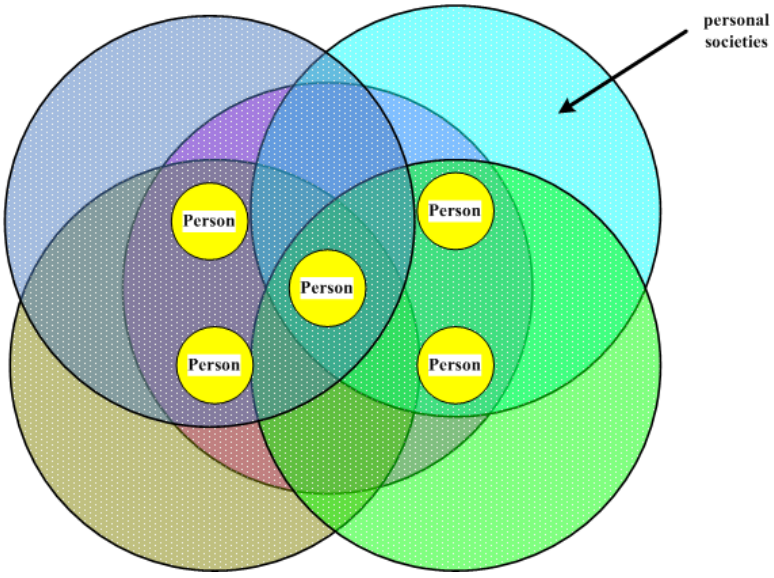



**Figure 11.2:** Social-chemical model of Society regarded as analogous to a metallic Object (SAMO).

Perhaps at this point you can begin to appreciate why mini-Communities present the most challenging sorts of problems any group of people collectively calling themselves a Society must deal with. If it is impossible for any two people to precisely understand each others' personal societies, what does this auger for the broader abstraction that is called a Society? Because the ontological standing of this object, like that of the personal society, is strictly mathematical, the only possible approach that can be taken with scientific objective validity is a mathematical approach in which mutually-agreed-upon concepts of objects of experience that can serve as signifiers of the abstract object are employed. Figure 11.2 illustrates one such mathematical model which at this time seems to offer a significant degree of likelihood for fecund scientific developments: the social-chemistry Society-as-metallic-Object model (SAMO model).

A general Society can be regarded in terms of overlapping personal societies defined by its members. Figure 11.2 illustrates these personal societies as the overlapping multicolored circles centered on individual persons. Because the reciprocal connections among people in a personal society are social-chemical bonds, one can regard individuals as being analogous to atoms in the lattice of a solid. The overlap of their personal societies can be regarded in analogy to molecular bonding fields in a solid. Mathematical methods exist for making quantitative models of binding interactions in such a structure. One of these is the method of embedding fields pioneered four decades ago by Grossberg during his foundation-setting work in neural network theory [Wells (2011a)]. Another is the method of Weaver's models [Wells (2011b); (2012a), chapters 4, 7, 9-10]. A third is the method of Linvill modeling [Wells (2010) chapter 4 §2.3, 3.6]. These methods are complementary rather than competing because their proper application in representing social phenomena at different scales of observation is used to effect modeling methods utilizing divers linked levels of scientific description in order to obtain computational tractability in an integrated theory [Wells (2010) chap. 7; (2011a)].

Metallic solids seem to provide an especially appropriate analogy for Societies. Metals have a number of characteristic features one frequently hears being used metaphorically in qualitative descriptions of Societies. Metals are ductile; they are highly conductive of particular kinds of energy (most notably thermal energy and electrical energy); they tend to have polycrystalline grain structures (mini-Communities) with glassy grain boundaries (irregular regions of atom distributions between grains – "the fringes of a Community"); they are subject to becoming brittle at grain boundaries when subjected to repeated strains (work hardening and metal fatigue ↔ the

formation of Toynbee proletariats). There are powerful quantitative methods and models, in addition to embedding fields and the other approaches already named, for analyzing their properties and characteristics [Leonard & Martin (1970), Harrison (1980), Harrison (1999)]. Here I will mention two of these: scattering theory and the method of orthogonalized plane waves. These are in addition to biological and biochemical models such as the biological respiration model and the concept of thermodynamic electron transport chains [Campbell *et al*. (1999), chap. 9]. There is, in short, a wealth of tools, methods, and concepts at the disposal of scientists who are accustomed to practicing *interdisciplinary* work (interdisciplinarians). Social scientists have long imagined being able to carry out their science with the rigor of, and obtain results comparable to, those of the physical-natural sciences. With the discovery of mental physics in 2006 [Wells (2006)], there is no longer any reason this can not be accomplished.

However, before *any* fecund quantitative model can be set up it is absolutely necessary that an accurate, objectively valid *qualitative* model be obtained. A qualitative model identifies *Dasein* and *Existenz*-structure of mathematical objects that are to be included in the model. You can't put numbers to mathematical objects if you do not have any objects, and putting in the numbers is *what and all* a *quantitative* model accomplishes. Without an objectively valid qualitative model, a quantitative model is nothing but a Platonic fantasy. Here it saddens me to say that too many empirical sciences – with the notable exceptions of chemistry and biology – pay too little attention to the development of good qualitative models. Sciences guilty of this include engineering, computer science, some departments of physics, psychology, and economics[2].

Analogy and metaphor are powerful tools for developing qualitative models but are also tools quite easy to misuse. Indeed, misuse of inferences of analogy historically led to a general distrust of reasoning by analogy among scientists. It is as important to account for where an analogy breaks down as it is for where the analogs are similar. For example, grains in a metal and mini-Communities in a Society have a certain attractive similarity. Each functions as a kind of unit. Each provides important orderings and regularities to its structures. Each profoundly affects the gross properties of the overall body – a physical body in the case of a metal, a body politic in the case of Society. There is, however, one very glaring fundamental difference immediately found between the analogs that cannot be ignored. In a metal, an atom belongs to one and only one grain (or else lies in a grain boundary). In a Society every one of the social atoms (human beings) at all times belongs to more than one mini-Community. Therefore, no social-natural hypothesis of Critical anthropology or social-natural sociology that is grounded in a condition contrary to this fact can be true. In the history of science, scientific paradigms (models and methods) break down, when they do, precisely at the points where the analogy that provided the starting point for the rational part of the science breaks down but inferences analogy are nonetheless drawn.

All the major paradigms of physical-natural sciences are *qualitatively* developed from the use of analogies. Feynman[3] taught,

> I want to discuss now the art of guessing nature's laws. It is an art. How is it done? One way you might suggest is to look at history to see how the other guys did it. So we look at history.
>
> We must start with Newton. He had a situation where he had incomplete knowledge, and he was able to guess the laws by putting together ideas which were all relatively close to

[2] To this I would add business science, leadership science, management science, sociology, anthropology, and education science if it were not for the fact that none of these are presently constituted as sciences at all. They are at best – and I think I'm being a little generous here – exercises in natural history, not natural science. I'm inclined to think the same thing is true of military science.

[3] Richard Feynman, 1965 Nobel Laureate in Physics. Feynman won his Nobel Prize for his contributions to the development of the theory of quantum electrodynamics, which is physics' crown jewel theory.

> experiment; there was not a great difference between the observations and the tests.[4] That was the first way, but today it does not work so well [in physics].
>
> The next guy who did something great was Maxwell, who obtained the laws of electricity and magnetism. What he did was this. He put together all the laws of electricity, due to Faraday and other people who came before him, and he looked at them and realized that they were mathematically inconsistent. In order to straighten it out he had to add one term to an equation. He did this by inventing for himself a model of idler wheels and gears and so on in space. He found what the new law was – but nobody paid much attention because they did not believe in the idler wheels. We do not believe in the idler wheels today, but the equations that he obtained were correct. So the logic may be wrong but the answer right. [Feynman (1965), pg. 162]

Feynman continues with other examples in the advancement of physics but his lecture remains vague about the specific analogs that were used by Einstein, Schrodinger, Heisenberg, Yukawa, *et al*. A much more detailed yet readily accessible history of the progress of physics and the ideas of analogy used by its principal discoverers is provided by De Broglie [De Broglie (1937)], who also provides us with a direct report on what his own thinking was when he introduced the then-radical idea that came to be known as De Broglie waves (for which he won the Nobel Prize in 1929). De Broglie's thesis was the starting point for both Schrodinger and Heisenberg. He also describes in vivid fashion the point at which the analogies broke down and what recourse physicists took from that occurrence. For any student of the history of science, De Broglie's book has to be on the required-reading list. It is noteworthy, by the way, that the great discoverers in the history of physics were themselves *also* students of the history of physics.

In more recent years, the grain analogy was employed in neuroscience for its investigations of the physiological basis of vision. It was discovered that the organization of neurons in the visual cortex of mammalian brains displays a columnar structure that in many ways resembles the regular structure of crystalline grains in solids. This "grain" structure was called a "functional column" and it was hypothesized that functional columns are the basic biological signal processing units of vision in the visual cortex. The idea was and is extremely attractive in its relative simplicity. Unfortunately, it did run into one major problem. It is possible by means of well-designed experiments to estimate the number of functional columns that must exist in order to adequately explain vision phenomena. When this estimation was carried out, it was discovered that the human visual cortex has to contain a great many more functional columns than is physically possible given the known volume taken up by a functional column and the known volume of brain occupied by the visual cortex. This led to the realization that there was a fundamental shortcoming in the grain analogy. The current resolution of this problem has not been to discard the "grain" notion of functional columns but, rather, *to add to them the special property* that these kinds of "grains" are dynamically reconfigurable, thereby adding to the idea of analogy the hypothesis that the possible number of *mathematical* functional columns is greater than the number of physical functional columns we observe. In such ways are models born of analogy modified and developed in the normal course of empirical science.

This modification of the theory of functional columns in neuroscience shares an interesting point of connection with the subject at hand. Specifically, the neuroscience model requires that it be possible for an individual neuron cell to "belong" to more than one *mathematical* functional

[4] More specifically, Newton started with the idea of "corpuscles" that had been introduced by Robert Boyle (1660) in his postulate of the ideal gas law (Boyle's law). Boyle's corpuscles, in turn, re-introduced science to the much earlier Greek idea of atoms as the indestructible little ultimate constituents of material reality. "There are only atoms and the void," said Democritus, "and all else is mere opinion." The corpuscle idea is an inference of analogy made based on rocks, lumps of dirt, and other ponderable bodies accessible in real human experience by means of a person's unaided senses.

column. If one likens the neuron-as-biological-atom to the idea of the human-as-social-atom, the relevancy of the neuroscience paradigm to the social-natural model of mini-Communities within a Society is, I trust, more or less immediately clear to you.

It is not practical for this Critique to attempt to develop a complete model of the sociology of education in the United States. However, the propagation of economic effects (an analogy to the idea of orthogonalized plane waves in a metallic solid) is a main-effect factor far too significant to ignore here. We must examine some economically-representative mini-Communities in order to begin to understand where and why the major educational reforms of the 20th century failed.

## § 2. Epochs $M_1$ (1880-1910) and $M_2$ (1910-1930)

In order for any definition of a mathematical Object to have scientific objective validity, it is necessary that the definition of the model contain, or be made capable of containing, an idea of a principal quantity of Critical mathematics. A principal quantity is a mathematical object defined to be placed in direct correspondence with sensuous phenomena of experience. As an object, a principal quantity is a *noumenon* standing at the present horizon of possible experience under the epistemology-centered system of metaphysics that provides the foundational principles of social-natural science [Wells (2011c)]. It is generally an error in scientific method to define one's Object by mathematical fiat because the scientist thereafter finds himself impelled to force phenomena to fit the theory rather than to force the theory to match up with phenomena at principal quantities. The proper empirical course is to begin with phenomena and examine these to obtain first notions of principal quantities. Even so, the scientist finds himself logically compelled to begin with some preliminary judgments of what phenomena seem to provide the most promise as starting points. Because the primary concern of this chapter is to deal with economic aspects of American Society in the 20th century – and this because economics is immediately pertinent to the individual's self-made practical rules governing his actions taken for the sake of the tangible power of his person (tangible *Personfähigkeit*) – some of the phenomena that initially seem to be of most immediate pertinence to the task at hand are:

- occupational categories of mini-Communities;
- type-of-workplace categories of mini-Communities;
- mini-Communities categorized by size classes of the employed population in business establishments and firms; and
- mini-Communities categorized by the earning power of specific trades employed in occupations and workplaces.

None of these categories are static in time. If, as the epochs hypothesis puts forward, the 20th century contained five distinct epochs, then it follows that the exploration at hand begin with them. Ideally, each epoch would be examined individually. Unfortunately, the available data that exists is insufficient for a full characterization of each epoch. In light of this, the starting point I now take deals with epochs $M_1$ and $M_2$ together.

I hope I have already made it sufficiently clear that the exploration is to be directed at getting down, as closely as the extant data permits, to individual human beings. People are the ultimate causative agents of social phenomena and a social-natural sociology must try to, at the least, grasp to sufficient degree those factors of social-chemistry and social environment most directly pertinent to individuals' higher tenets of Obligation-to-Self and reciprocal Obligation with those others with whom the individual chooses to form social-chemical bonding relationships. This is because these higher practical maxims, and no others, are the practical maxims of individuals' exercises of their liberties-of-action that produce social phenomena. For epochs $M_1$ and $M_2$ the available data provided by the Census Bureau is severely limited in extent.

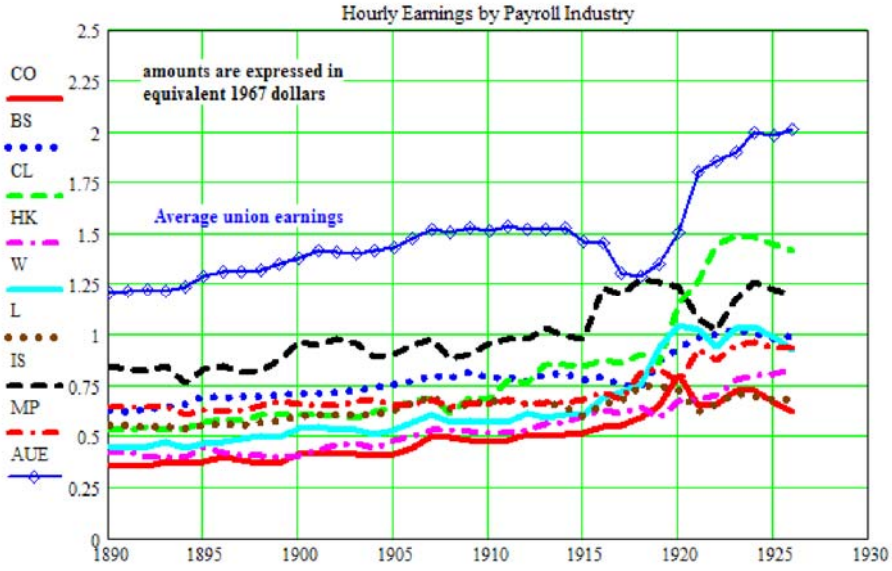



**Figure 11.3:** Average hourly earnings by non-management wage-earners categorized by type of payroll manufacturing industry group in equivalent 1967 dollars. Key: CO = cotton industry; BS = boots and shoes industry; CL = clothing industry; HK = hosiery and knit goods industry; W = woolens industry; L = lumber industry; IS = iron & steel industry; MP = slaughtering and meat packing industry; AUE = unweighted average union earnings (all industries). Source: Douglas (1930) Table 21, pg 101.

One data set of seemingly obvious pertinence consists of the average hourly earnings by wage-earner entrepreneurs categorized by payroll manufacturing industry classification. Figure 11.3 provides a graph of data provided by Douglas covering the years from 1890 to 1926 and re-expressed in equivalent 1967 dollars to eliminate the factor of inflation[5]. It is important to understand that the data provided refers to actual earnings rather than wages. Douglas defined *hourly wages* as the wage-rates paid for an hour's work (e.g. 50¢ an hour). He defined *hourly earnings* as the average total earnings received by a worker during a given week divided by the number of hours actually worked. Hourly earnings frequently exceed hourly wages because they include their proportionate fraction of any bonuses or other special stipends paid to the workers. Earnings, rather than wages, reflect the actual revenues received by workers over a particular time period. Workers in payroll manufacturing industries were partly comprised of union workers and, in greater part, partly comprised of non-union workers.

To properly assess the significance of this data it is necessary to estimate what fraction of the total U.S. civilian labor force and U.S. civilian population is represented in Douglas' figures. This cannot be done with exactitude because of the paucity of the available data and differences in what years are covered by various statistics available, differences in the makeups of reference groups measured, and other sources of variation. A rough approximation, therefore, is the best that can be done from the available sources of data. Douglas provides fairly detailed information about the populations represented in his statistics figure 11.3 depicts [Douglas (1930) pp. 73-81]. National labor force statistics for the period reasonably similar enough to provide a rough basis for comparison are provided by National Industrial Conference Board data published by the U.S. Census Bureau [Bureau of the Census (1949), Series D 64, 69, pg 65].

[5] To put these figures in perspective with 2010-equivalent dollars multiply the amounts shown by 6.53. Earnings of 50¢ an hour, for example, correspond to earnings of $3.265 an hour in 2010-equivalent dollars.

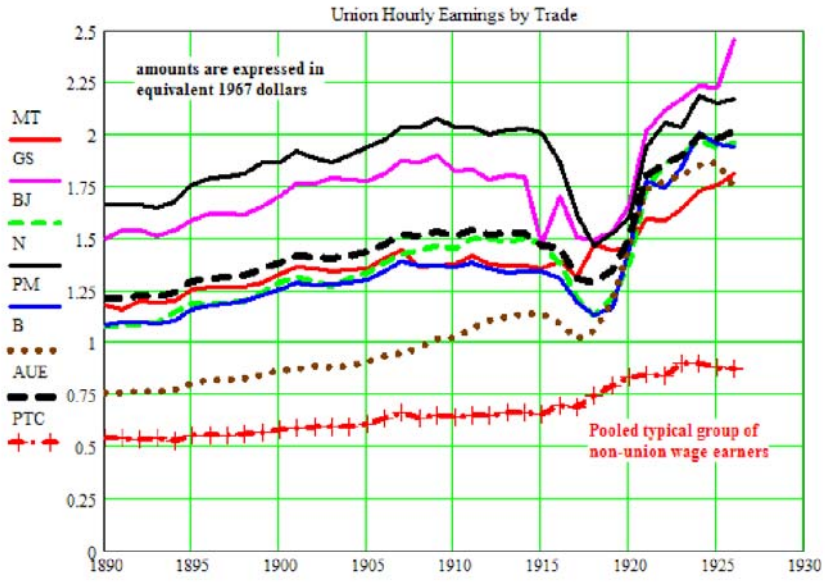



**Figure 11.4:** Union-member average hourly earnings by trade group expressed in equivalent 1967 dollars. Key: MT = metal trades; GS = granite and stone workers; BJ = book and job printers; N = newspaper printing; PM = planing mill workers; B = bakers; AUE = unweighted average union earnings; PTC = unweighted pooled typical group of payroll industry workers. Source: Douglas (1930) Table 18, pg. 96.

The reason any comparison is possible at all is because Douglas' study was a sample-based study of manufacturing industries employing the accepted methodology of his time. What this is generally taken to signify in statistical analysis is that the sampling covers a representative group providing what is known as a "sufficient statistic" to cover a larger population-as-a-whole. To the extent that Douglas' survey accomplished this measurement objective (a question there is no way to answer at a level of confidence on the order of 95%), the data presented in figure 11.3 represents the income revenue circumstances of a significant fraction of the U.S. employed labor force. The labor statistics published by the Census Bureau tell us that the employment group represented in figure 11.3 ranged from a low of about 21% of the employed labor force (1902) to a high of about 27% (1917 and 1920) with an average of 23.4% and a standard error of 1.60% from 1900 to 1926. There is no discernible trend, either up or down, in the statistics over this period. Thus the Douglas data pertains to about one out of every 4.3 employed workers in the U.S. during $M_1$ and $M_2$. Other data shows that manufacturing earnings from 1890 to 1926 ran fairly consistently at an average of about 87.5% of average U.S. overall non-agricultural earnings (with a standard error of 3.98%), with no discernible up or down trend [Bureau of the Census (1949) Series D 135-136, pg. 68].

It is easily noted in figure 11.3 that general payroll industry earnings were significantly below average union earnings throughout the period except for the years from 1917-1919. Figure 11.4 graphs union-member earnings by trade group over this period. Three strata of earnings levels are clear at once in this graph. The high stratum is occupied by the newspaper printing and granite & stonework unions, the lowest stratum by the bakers, with the remaining three unions occupying the middle stratum. The lowest stratum, the bakers, stands significantly higher than the pooled average earnings paid to payroll industry laborers, although comparing the bakers' earnings with those of figure 11.3 shows that payroll industry wage earners in the iron & steel industry did out-earn members of the bakers' union until 1910 and again after 1917 until 1920. By comparison, payroll industry wage earners did not exhibit clearly stratified earnings with the exception of the iron & steel industry group until after 1920.

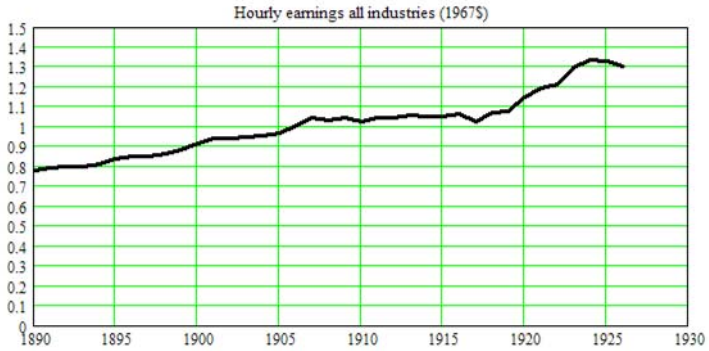



**Figure 11.5:** Average hourly earnings for all industries in 1967 dollars. Source: Bureau of the Census (1949) Series D 122, pg. 67.

With the exception of the unions in the period from 1914-15 to 1919, all groups' earnings remained flat (as shown by the horizontal movement of earnings from year to year) or slightly increased (as shown by a gradual increase in earnings). 1880 to 1910 was a period of no inflation (chapter 10, figure 10.1), and so this data indicates that workers' earnings in payroll industries were stagnant during $M_1$ and well into $M_2$. This is in contrast to union earnings, which exhibited a slow, irregular, but monotonic increase through the end of $M_1$. The exceptional period for the unions coincides with the period of high numbers of work stoppages, averaging 4000 per year from 1915 to 1920 (chapter 10, figure 10.14). This drop in union earnings is in contrast to the previous period from 1901 to 1905, which averaged 3000 work stoppages per year.

The facts that earnings differed among the industry groups and between union and non-union members demonstrates that industry employment group and union membership vs. non-membership are two features marking differentiations between mini-Communities. One implication this holds for Census Bureau reporting is that non-reporting of differences according to these marks of mini-Community unintentionally conceals information pertinent to the function of government insofar as government's general objective of promoting the general welfare of the citizenry is concerned. Still, data covering epochs $M_1$ and $M_2$ exhibit few irregularities or problems, at least insofar as these manufacturing groups are concerned, other than in work stoppage data. Payroll industry wage earners earned less than the average for wage earners in all industries combined (figure 11.5), with the exception of workers in the clothing industry after 1920, while union members earned more than the all-industries average earnings in $M_1$ and $M_2$. The earnings performance of unions in $M_1$ and $M_2$ vividly illustrates that mutual advantages are gained when people combine themselves in a civil Community to increase their tangible *Personfähigkeit*.

Another factor marking a mini-Community distinction is found in examining the number of wage earners employed in the same business establishment. In the terminology of the Census Bureau, an ***establishment*** is a business entity located in one specific geographical place and having an active payroll. A ***firm*** is an aggregation of establishments owned by a single parent company.

Historical data on the number of business establishments and the size of the wage-earning labor force per establishment is sparse. Figure 11.6 illustrates available data on the estimated number of U.S. manufacturing establishments and the average number of wage earners employed per establishment from 1899 to 1914. The data on the number of establishments is calculated from census statistics compiled by Rees [Rees (1961), Table C-1, pp. 145-147].

This data shows that the great majority of all manufacturing establishments during $M_1$ were small-to-medium sized establishments employing fewer than 125 wage earners, and the majority of these employed fewer than 100 wage earners. This is a significant increase from the average of

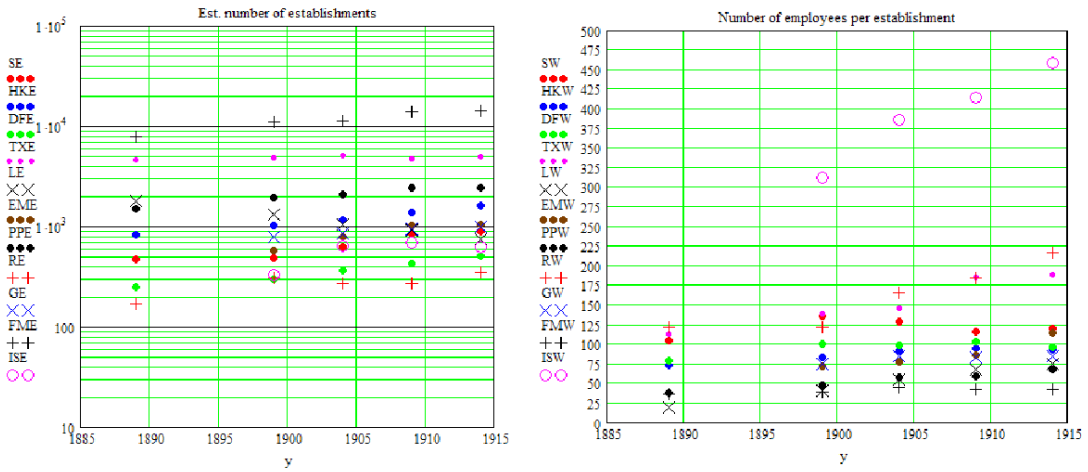



**Figure 11.6:** Estimated number of manufacturing establishments and the number of wage earners employed per establishment from 1889 to 1914 categorized by type of business. Source: Rees (1961) Table C-1, pp. 145-147. Key: S = silk; HK = hosiery and knit products; DF = textile dyeing and finishing; TX = all textiles; EM = electrical machinery; PP = paper and paper products; R = rubber; G = glass; FM = foundry and machine shops; IS = iron and steel; E denotes establishment, W denotes wage earners.

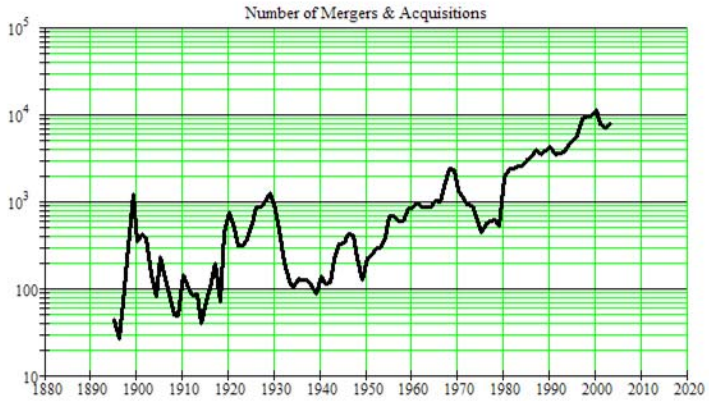



**Figure 11.7:** Mergers and acquisitions from 1895 to 2003. Sources: for 1895 to 1970, Bureau of the Census (1976) Series V 38, pg 914; for 1971 to 2003, Bureau of the Census, various editions of the Statistical Abstracts (1979, 1981, 1988, 1990, 1998, 2004-05), all in the Business Enterprise sections.

eight to twelve wage earners per manufacturing establishment in the 19th century from 1859 to 1899 (chapter 7, table 7.7), but it continues to reflect that the typical manufacturing establishment in America was still predominantly small. The number of "battleship-sized" establishments employing 300 or more wage earners in $M_1$ ranged from just over 300 in 1899 to around 700 by 1909. This compares to around ten thousand establishments employing fewer than 50 people.

Although trusts and holding companies had been in existence since the 1870s, in $M_1$ America had not yet entered a sustained period of corporate mergers that came to characterize $M_4$ and $M_5$. Figure 11.7 graphs merger activity from 1895 through 2003 according to Census Bureau data published in various editions of the Statistical Abstracts. During $M_1$ most of the major merger activity involved the formation of giant firms, such as the forming of U.S. Steel by J.P. Morgan in 1901. Vigorous prosecution of anti-trust laws by the Theodore Roosevelt and Woodrow Wilson administrations tended to dampen enthusiasm for the otherwise emotion-driven merger fads of the $M_1$ and early $M_2$ periods. It is, however, interesting to note that the major anti-trust acts of

legislation in the 20th century, namely the Clayton Anti-Trust Act of 1914, the establishment of the Federal Trade Commission in 1914, the Robinson-Patman Act during the Franklin Roosevelt administration, and the Celler-Kefauver Amendment to the Clayton Act in 1950 all came at troughs in merger activity. Also interesting is that the passage of these acts was soon followed by a new explosion of what business reporters have come to call "merger mania."

Merger activity in any period is interesting because mergers act in the business world as a force analogous to what Toynbee called the arising of "universal states" in political history. Toynbee found that the emergence of a universal state – e.g. the Roman Empire in Hellenic civilization, the Abbasid Caliphate in Syriac civilization, the Empire of the Guptas in Indic civilization, etc. – marked the onset of the final stage in the disintegration and fall of those civilizations [Toynbee (1946), pp. 12-34]. To my knowledge, no similar study of economic history has yet been carried out, but, as I will argue elsewhere from social-natural principles grounded in mental physics, the emergence of unregulated universal business-states (monopolies) in a nation's economy poses the same threat to that nation's economic system. Specifically, they threaten a breakdown in governance of Enterprise that provokes disintegrations in productivity, innovation, product quality and competitiveness against foreign Enterprises. In $M_1$ and $M_2$, however, that specter was not present in the U.S. economy.

There are, of course, numerous other marks for distinguishing mini-Communities. These include:

- state of residence
- municipality or rural area of residence
- race or ethnic background
- gender
- age
- religion

and others as well. All these factors have linkages to economic factors affecting individual and mini-Community tangible *Personfähigkeit*. For example, it is well known women often are paid less than men for the same occupational work, and I see no evidence that this discrimination has ended in the United States. Race is likewise a mark with economic linkages. These are well enough known to most Americans that I need not provide detailed descriptions. The Statistical Abstracts put out annually by the Census Bureau can provide you with the hard data.

Historically, the Census Bureau is a bureaucracy that has tended to be reactive rather than pro-active in its activities. It responds to headline-making current events of major significance, to the whims of the U.S. Congress or the White House, and to major domestic disruptions and issues of great controversy impacting domestic tranquility. It is also an agency that has to operate on a set budget fixed by Congress and must do as much as it can within the fiscal resources it has available for its operation. Given all these factors, the Bureau actually does a quite remarkably good job although it falls well short of being, as some have occasionally enthused, a "statistical laboratory." In 1914 former Census Bureau chief clerk William Rossiter called it a "figure factory." His meaning can be taken in two ways, both of which are contextually appropriate.

My point in making this little digression is this. I have not included the mini-Community factors I just cited, and others, in the present analysis for two reasons. One is that to do so with the thoroughness I think is necessary would result in a very large book (on par with the statistical histories cited in this work as well as the more recent five-volume statistical history published in 2006). More fundamentally, reporting classifications used by the Bureau have changed often enough, with too little guidance as to how to integrate the divers series, that I have not come up with a method for presenting historical series with enough pertinent facts regarding these factors.

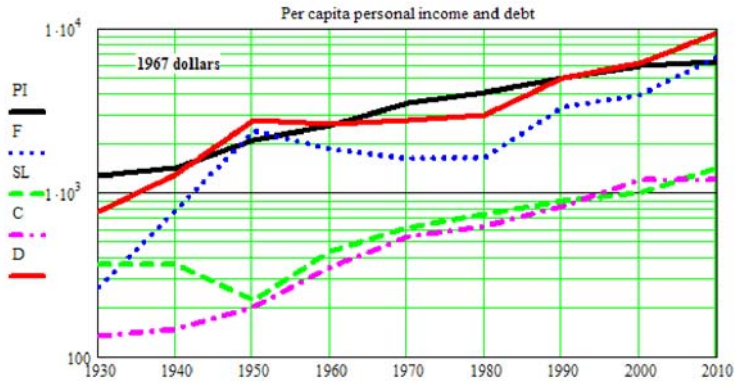



**Figure 11.8:** Decennial per capita personal income and debt from 1930 to 2010. Sources: Bureau of the Census (1965) Series 369; Bureau of the Census (1976) Series F 262, Y 680, F 387; U.S. Census Bureau (2011) Tables 679, 470, 439, 1190; Federal Reserve Bulletin on consumer credit reported in the New York *Times* Almanac (2008), pg. 334. Key: PI = per capita personal income; F = federal debt; SL = state & local public debt; C = consumer credit outstanding; D = total of F, SL, and C.

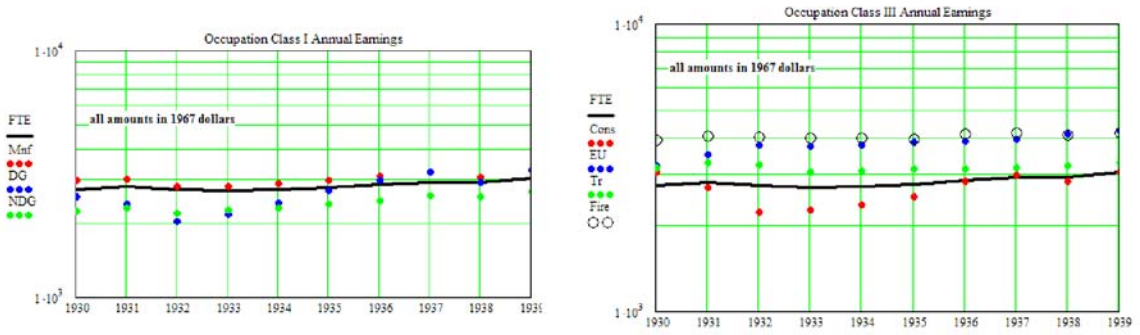
These remarks are criticisms of the Census Bureau, but I regard them as very minor ones when the practical difficulties the Bureau has to overcome each year are factored into the balance. On the whole, the Census Bureau does do an outstandingly good job in its public service mission and it is one of the most valuable public assets of government for enabling government to meet its Duties of establishing and maintaining justice and promoting the general welfare. The Census Bureau is quite possibly the most important non-instructional education institute in the U.S. today. But it can be even better. And we all need it to be the best it can be. As an old saying in the business world puts it, "Nothing is more damaging to an opinion than a number."

## § 3. Epoch $M_3$ (1930-1940)

The proximate trigger event for period $M_3$ was the stock market crash in October of 1929. The crash itself was not a total cause of the Great Depression. The partial causes are all, as is always true, found in individual actions taken by human beings exercising their liberties of action. A major social catastrophe like the Great Depression is a concurrence of many independent events that combine to produce unintended consequences. Were it not for World War II, which was in part a follow-on effect of the Great Depression, $M_3$ would probably have gone done in the history books as the greatest social-natural disaster of the 20th century.

A great deal of folklore and myth has come to be associated with $M_3$. Closer examination of the facts rather quickly brings out inconsistencies between legend and what actually took place. As a starting point for analysis, figure 11.8 presents a panoramic overview of per capital personal income as well as public and consumer credit debt from 1930 to 2010. The first thing I wish to point out in this figure is that per capita personal income actually rose slightly between 1930 and 1940. This might, of course, be a filtering effect masked by the decennial sampling interval. However, closer examination of average annual earnings of the employed labor force shows the data in figure 8.11 is not misleading. Figure 11.9 presents some selected data organized by occupational classes for 1930 to 1939.

The first thing to notice in this figure is the average annual earnings for all full time wage earners for all industries (FTE). Annual earnings, in 1967 dollars, exhibit a slight ripple but remain remarkably constant at just under $3000 throughout $M_3$. So, too, do all-manufacturing earnings and financial, insurance and real estate industries' earnings. The gas and electric annual




A B

**Figure 11.9:** Selected annual earnings data for wage earners categorized by occupation classes and expressed in 1967 dollars. A: manufacturing industry wage earners. B: non-manufacturing industry wage earners. Source: Bureau of the Census (1976) Series D 722, 740, 745, 751, 753, 754, 807, 810. Data from series 807 and 810 were annualized assuming a standard work year of 52 weeks. Key: FTE = all full time employees, all industries; Mnf = all manufacturing wage earners; DG = wage earners in the durable goods manufacturing sector; NDG = wage earners in the non-durable goods sector; Cons = all construction industry wage earners; EU = electric and gas utility industry wage earners; Tr = total trade industry including both wholesale and retail trade; Fire = financial, insurance and real estate industries. The occupational classes shown here are derived from classifications that are shown later covering epoch $M_4$.

earnings actually exhibit a monotonic increase over $M_3$. In the durable and non-durable goods manufacturing categories and the construction industry, annual earnings fell sharply from 1930 to 1932 and then recovered from 1933 to 1939 to re-attain or exceed their levels at the beginning of the period. The trade industry (which here combines the wholesale and retail industries) also stayed remarkably flat over the period. There were, then, some specific occupational groups that were adversely affected in the first few years of the Great Depression, but on the whole those wage earners who were able to remain employed did not suffer as much in terms of earning power during $M_3$ as common folklore today would have it.

It was a different story for the roughly ten million Americans who lost their jobs during the Great Depression. Figure 11.10 graphs the number of people in the civilian labor force (people actually employed), categorized into agricultural and non-agricultural laborers, and the number of unemployed Americans from 1929 to 1940. Although stories of the Great Depression are filled with tales of farm foreclosures, the actual decrease in the employed agricultural labor force was in

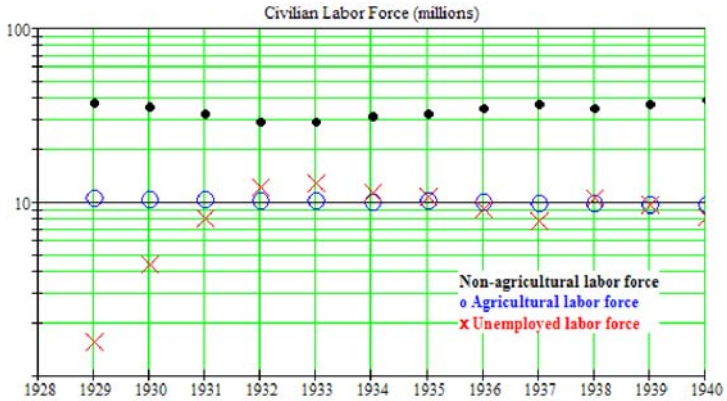
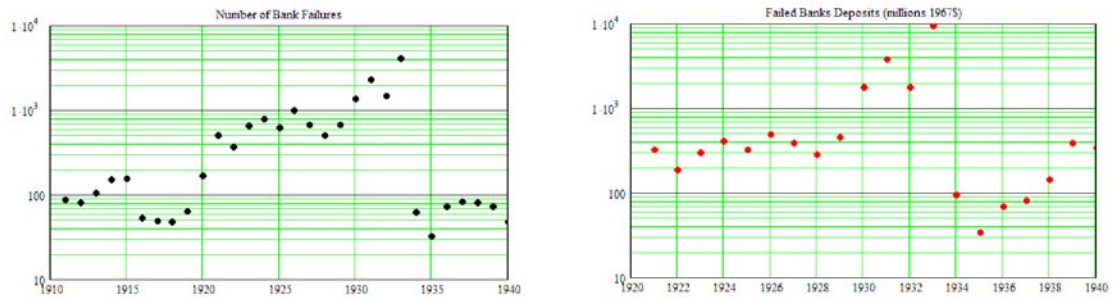



**Figure 11.10:** Civilian labor force (in millions) and unemployed labor force. Source: Bureau of the Census (1965) Series D 6-8.




A B

**Figure 11.11:** Number of bank failures from 1911 to 1940 (A) and amount of deposits residing in these failed banks in millions of 1967 dollars from 1921 to 1940 (B). Source: Bureau of the Census (1976) Series X 741, 748, 756, and 761. Deposit data prior to 1921 is not available, which is one of the consequences of the lack of regulation of the banking industry prior to 1934. As points of reference, the average number of banks failures per year from 1880 to 1910 was 78.8 with a standard deviation of 87.6. This unusually large standard deviation is almost entirely due to the banking panic of 1893, a year in which there were 496 banking failures. If that year is excluded, the average number of banking failures was 64.9 with a standard deviation of 41.6. Also for reference, the number of bank failures in 1941 was 16, involving a total of $42.6 million (1967) dollars in deposits. The number of banking failures throughout $M_4$ never again approached the levels of even 1910 to 1920. In 1966, the worst year dollar-wise for banking failures in $M_4$, there were 8 banking failures involving deposits of $109 million (1967) dollars.

fact very slight. The biggest impact came in the non-agricultural labor force, which fell from just below 40 million workers in 1929 to a low of just under 30 million in 1933 before beginning the recovery. Declines/increases in the non-agricultural labor force are matched nearly one for one by the increases/declines in the number of unemployed workers. By 1933 the economic recovery was already underway, due in part to some measures passed during the Hoover administration and in part to measures passed during the Roosevelt administration.

The difference between the Republican Party rule of the country, that brought about the social environment that produced the Great Depression, and that of the Democratic Party rule of the Roosevelt years was one of philosophy of government. Republicans believed it was the responsibility of individuals and state and local communities to deal with the crisis. Democrats believed it was the responsibility of the general government to step in when problems were too big to be handled individually or locally, or when state and local authorities were either not doing enough or unable to do enough by themselves. Neither side is completely correct nor completely wrong in these opposite views, but on the whole the philosophy of the Republican Party was the more highly antisocial of the two. The Great Depression *was* a national emergency too big for state and local resources to deal with.

I commented a moment ago that it was the rule of the Republican Party that brought about the conditions which produced the Great Depression. This observation demands some explanation. The root cause of the Great Depression was uncivil business actions made possible by a lack of government legal and regulatory oversight. The Great Depression was primarily triggered by the stock market crash of late 1929, but the conditions that brought on this crash were set up during the so-called Roaring Twenties. The Great Depression was largely caused by actions taken previously by bankers, investment company agents, and speculators. It was primarily a banking system failure that was exacerbated by additional unwise but commonplace debt practices.

Figure 11.11 shows the number of banking failures for the years from 1911 to 1940 and the amount of the deposits (in millions of 1967 dollars) lodged in these failing banks. The period was an extraordinary one in U.S. 20th century history for banking failures and losses to depositors caused by these failures. The principal mechanism involved was excess financial leverage.

In the financial world, the term "leverage" means the control of a large amount of capital resource by means of the use of short-term borrowed funds. When one invests with leverage, that investment is said to be a "margin" transaction. Here are two examples of how it works.

I buy $50,000 worth of, say, a common stock using $5000 of my own money and $45,000 that I borrow from you. I am said to be "operating at 10% margin" in this transaction because only 10% of the proceeds actually belong to me. You, being a financially astute individual, require me to deposit with you assets amounting to some specified proportion of the money you are loaning me. Typically the assets will be in the form of other stocks I already own. If the stock goes up in price, all is well. I eventually sell it – say for $75,000 – and return your capital to you along with interest owed. I pocket the remainder. You make a small profit, I make a big one – on the order of $25,000 from a $5,000 expenditure of my own money. How sweet it is.

But wait. Suppose my investment decision was a mistake. Instead of going up, the stock drops from $50,000 to $47,000. Now *your* capital is at risk because if the stock drops much lower my margin deposit with you won't cover your losses. You issue a "margin call" to me – a legal demand that I deposit more assets with you to "maintain my margin." If I am able to meet the margin call, that's fine with you. Your capital is secured and you don't mind if *I* lose money.

But suppose I do not have the reserves to meet the margin call. Now you seize the assets I deposited with you, sell them, and recover your capital, wiping out my debt in the process. You are said to have "sold me out." Now, in effect, all $50,000 of the transaction is *my* capital and it's all tied up with the stock in play – putting me at a net loss of $3,000 (so far). I am now holding bad paper and the probably far more valuable assets I once owned are mine no longer.

But things can get much worse than this, and that is precisely what happened in October of 1929. Suppose a great many stock market players are as highly leveraged as I am. Stocks begin to dip across a broad front, triggering margin calls from many lenders such as you. When you go to sell what were my stocks, your selling action further depresses the price, triggering more margin calls – some of which cannot be answered by the speculators. More lenders now "sell out" their borrowers, which further depresses stock prices, causing more margin calls, and etc. The situation very quickly feeds on itself and a general panic sets in. Adding to the mix are some number of more astute traders who foresaw the developing situation and began selling stocks short (borrowing *stock* which they then sell and repurchase later, at a lower price, to repay their lenders the *stock* they owe them). Their selling activity pushes prices even lower. The result is a stock market crash. The short sellers make a profit; *everyone else* sustains large losses.

In 1929 many banks were themselves market speculators trading on high levels of margin. 10% was not an atypical margin level at that time. Furthermore, both banks and brokerage firms encouraged individual and corporate investors to "get in on the opportunities" by making highly leveraged investments. In 1929 there were no regulations limiting the amount of margin an investor could take on, no regulations setting requirements on banks' cash reserves against deposits, and many banks invested in speculation so heavily that they became unable to meet the normal demands of their depositors for withdrawals from savings accounts, much less answer any margin calls they began to get. The market crash caused some banks to fail and their depositors to lose their savings. This was widely reported and panicked other depositors, who flocked to their banks to take their money out. This is called a "run on a bank." More and more banks found themselves unable to satisfy the withdrawal demands of their panicky depositors and failed in their turn[6], whether they had been market speculators or not. Losses to depositors climbed to nearly $10 *billion* 1967 dollars in 1933 (roughly equivalent to about $65 billion in 2010 dollars).

[6] No bank, credit union, or other financial institute can withstand a run on its deposits for very long. During the financial crisis in 2008, we came very close to a general run on the banks – which would have wiped out the savings of a great many people, multiplied foreclosures, and brought on another Great Depression.

The failing banks, in an effort to save themselves, began calling in their loans to businesses and individuals – which often wiped them out as well. (*Any* debt financing is a form of margin investment). There was a general business decline and a great many companies were forced to lay off employees. What I have just described is, of course, a bit simplified. But it is in real essence the series of circumstances that happened in 1929-33 and ushered in $M_3$. All of this was made possible by the *laissez faire* attitudes of the general and state governments and their dereliction of the governmental Duty to promote the general welfare of the republic. But it was the *predictable* actions of individual and corporate speculators that actually *realized* the disaster.

During the Roosevelt administration a number of needed reforms and regulations were put into place with the aim of preventing a recurrence of the events from 1920 to 1933. The Securities and Exchange Commission now regulates margin trading, the Federal Deposit Insurance Corporation was established to shield depositors, up to a point, from malpractices and crimes perpetrated by bank agents[7], and the Census Bureau has acquired a host of new reporting responsibilities. These reforms worked. In the following years, $M_4$ and $M_5$ up to 1981, Democratic Party controlled Congresses and administrations tended to add more and more regulations, and to try to more and more micromanage the economy. The result eventually was a hindrance of stifling overregulation. During the Reagan administration a number of these were cut back or eliminated – which was an altogether proper policy consistent with the government Duty to promote the general welfare of the republic. But in the "deregulation fever" that overtook the Republican Party in the later Reagan years, there was a dangerous return to the same *laissez faire*, hands-off-business policy-making that produced the Great Depression. The financial crisis of 2008 is one of the fruits of this atavistic attitude that has become Republican Party dogma. I can conclude no otherwise than either Republican Party leaders are ignorant of history and economics, or else their party propaganda is deliberately designed to be misleading, or both. However, the Republican Party by no means has the market on economic and historical ignorance cornered. Both parties think with their glands, seek only to rule, and treat Duty as a sound-bite.

## § 4. Epoch $M_4$ (1940-1970)

Epoch $M_4$ can probably best be characterized as a period when the United States met a series of Toynbee challenges across a broad front that kept the nation off balance for thirty years. The recovery from the Great Depression ($M_3$) had been underway only a few years when the U.S. entered World War II. America labeled itself a "superpower" and "cold war" with the U.S.S.R got underway. A power struggle arose between the executive and legislative branches of the general government. A war broke out in Korea, followed by a settling period under the Eisenhower administration. Then came a period describable as an awakening of social conscience and a summons to civic Duty (known to political history as the New Frontier and the Great Society). Lastly, violent internal conflicts erupted that must properly be seen as a civil war.

The nation appeared to deal with these Toynbee challenges only to enter a new national epoch, $M_5$. Economically, the shock transient produced by World War II had settled out by 1955 and from 1955 to 1965 the economic environment had more or less settled into a new equilibrium period of natural growth. However, many of the old social models and assumptions had been subtly or not so subtly altered, but these changes were not well recognized at the time. The epoch also saw the coming-into-its-own of an earlier innovation in the division of labor, the so-called "professional manager." Finally, the apparent peace restored in $M_5$ between the divers factions developed during the period of civil war proved to be merely a *détente*. The violence and turmoil of the civil war left wide social breaches and many things unsettled in its wake.

[7] Back in the 1980s I was told by an agent I know who was with the FDIC at the time that the principal cause of bank failures since the 1930s has been embezzlement by bank officers, often the bank's president.

Coincident with all this, $M_4$ was also an epoch of rapid scientific and technological innovation the likes of which had never been seen before in the history of humankind. Scientific and technological innovations in and of themselves were nothing new. Today it is little remembered that in the 1880s Carnegie Steel was the world's premier high-technology company. Thomas Edison, the prolific tinkerer and inventor nicknamed 'the Wizard of Menlo Park,' had peppered the world with a record number of new inventions. The thirty years from 1900 to 1929 had transformed the science of physics. The invention of the steam engine altered life in the 19th century as surely as using interchangeable parts (an innovation dating to China's Ming dynasty) in Eli Whitney's cotton gin revolutionized manufacturing. Humankind has been innovative since prehistoric times.

What was different and, if you'll pardon the expression, epoch-making about scientific and technological innovation in $M_4$ was the *pace* of innovation. Never before had so many significant inventions come so rapidly, with such broad-based applications, been commercialized so quickly, and delivered such an immediate and rapid series of impacts on the lives of ordinary people. To name just a few of these, the era saw: (1) the development of radar technology; (2) the development of atomic energy and atomic weapons; (3) the discovery of information theory and the revolution in communication systems that followed; (4) the discovery of the neural network concept in brain theory and its birth twin, the digital computer; (5) the discovery of the transistor and development of semiconductor technology; (6) the dawn of the space age and the invention of communication satellites; (7) the discovery of the double-helix structure of DNA, which revolutionized biology; (8) the discovery and development of the laser; (9) the development of plastics technology and commercial product designs that exploited it. These are just a few of the inventions and innovations that were made in $M_4$.

This avalanche of discovery was not an unalloyed good. It certainly made life easier and materially better for a great many people, but the pace of innovation also brought with it social problems and issues of conscience as the possibilities it opened outpaced people's capacities to understand *all* of their implications. Bluntly put, the *social* sciences were unable to keep up with the pace of the physical sciences; and because all the social sciences had long since ceased to be social-*natural* sciences, it is almost beyond a reasonable doubt that they would not have served to better merge new technology with social life. People found themselves suddenly living in a new social and economic milieu where many of the important old folkways were no longer effective or no longer meaningfully applicable and yet continued to be applied.

Evidence hinting at this appears in figure 11.8. It is obvious at a glance that in the interval from 1940 to 1970 there is no hint of any log-linear behavior in any of the per capita debt graphs aside from the illusory ones decennial sampling automatically produces in a line graph as the line is traced from one sampling point to the next. It takes closer and more careful inspection of the per capita personal income line to see that this, too, exhibits little evidence of natural growth pattern behavior, i.e. $x(t) = x_0 \cdot (1 + r)^t$, from 1940 to 1970 that is sustained beyond two decennial sample points. Per capita personal income does seem to accomplish this from 1950 to 1970. The fitting function is

$$PI_{4(2)}(y) = 2048.564 \cdot (1 + 0.026447)^{y-1950}$$

but the correlation for this fit is only $R = 0.9928578$. This is above the threshold of 0.990 but is so close to this threshold that without corroboration one cannot conclude at a very high level of confidence this fit represents anything more substantial than a mere mathematical model lacking a mathematical principal quantity linking it to the sensible world of human experience. Per capita personal income is a *national* average, and if it does not present the character of a natural growth process then the implication is that the United States' social, economic and political environments were in overall conditions of disequilibrium. The following analyses bear this out.

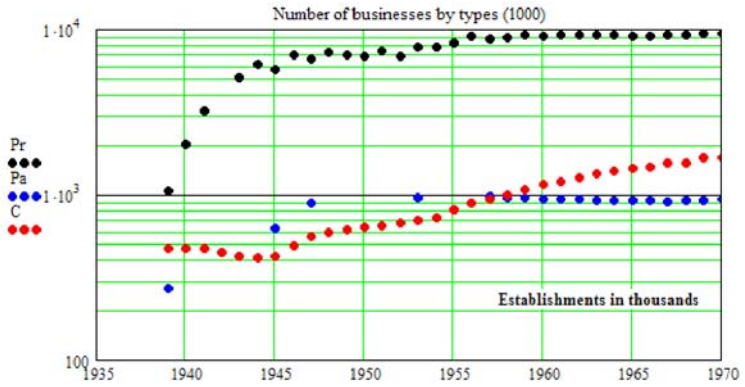



**Figure 11.12:** Number of proprietorships, partnerships, and corporations (1939 to 1970). Source: Bureau of the Census (1976) Series V 1-12. Key: Pr = proprietorship; Pa = partnership; C = corporation.

## § 4.1 Proprietorships, Partnerships, and Corporations in $M_4$

Figure 11.12 graphs the number of U.S. business establishments by type from 1939 to 1970. The three identified types of business establishments are the private proprietorship, the partnership establishment, and the corporation. Graph units are in thousands of establishments.

Proprietorships are the most common form of business establishment in the U.S. by a wide margin during $M_4$. This will continue to be true in $M_5$, although corporations will slightly decrease the gap in that period. Proprietorships are, in the main, the penultimate "small business"[8] and make up the great majority of establishments officially recognized by the Small Business Administration as "small businesses." They are also the surviving remnants of the Colonial period entrepreneur, when almost every (white) boy could reasonably expect to own and operate his own shop or farm when he reached adulthood.

The figure shows that the number of proprietorships grew rapidly from 1939 to the end of World War II. This was followed by a ragged leveling-off period that led to another mild and brief growth spurt from 1953 to 1956. From 1956 the number of proprietorships stayed more or less constant at just under 10 million establishments. More precisely, 1956 to 1970 was a period of gently undulating proprietorship population, averaging 9.121 million establishments with a standard deviation of 185 thousand. Thus there was a equilibrium in proprietorship population reached in $M_4$, but not until 1956, and this equilibrium was not a growth process.

Data on partnerships is very sparse prior to 1957. By 1957 the partnership population had stabilized at a slowly undulating and more or less constant level of about 934 thousand establishments. It is possible this state might have been reached as early as 1947, although it is only possible to say with a high level of confidence that it was not established before then. Thus, partnership establishment population had come into a state of equilibrium by 1957 at the latest, with a standard deviation of about 18,300 establishments.

[8] The *ultimate* small business is the wage-earning enterprise of the individual wage-earner entrepreneur. However, his enterprise is traditionally not recognized as constituting a "business" even though it is through the marketing of his tangible skills that the wage-earner entrepreneur obtains his revenue. Just because I might work for the XYZ Corporation, that doesn't necessarily mean I regard myself as "belonging" to XYZ. It depends on whether or not the company operates with an internal environment of *civic* free enterprise or *uncivic* free enterprise. If it is the latter, I assure you I don't "belong" to it. If it is the former, then I do. The practical maxim is echoed in an old limerick that goes, "Here's to you and here's to me and here's to love and laughter. I'll be true as long as you, and not one second after."

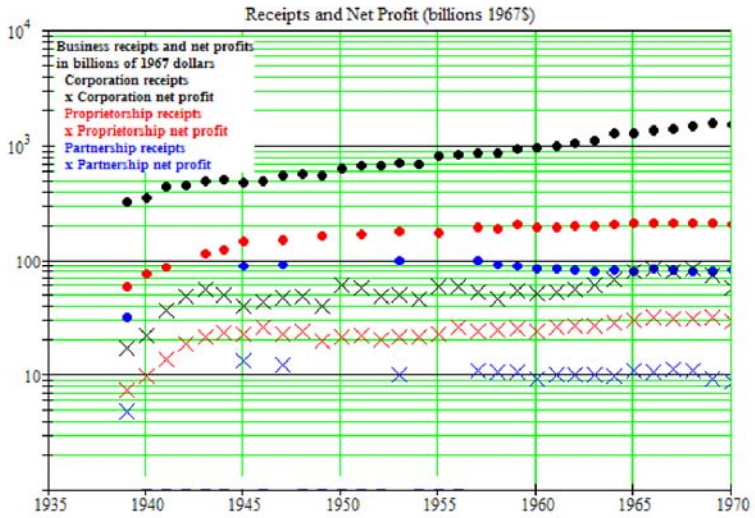



**Figure 11.13:** Business receipts and net profits for proprietorships, partnerships and corporations in billions of 1967 dollars from 1939 to 1970. Source: *op cit.* figure 11.12.

The population of corporation establishments exhibited an S-shaped undulation wobbling about an axis of about 550 thousand establishments until 1954. From 1955 to 1959 it exhibits signs of natural growth at an annual rate of 7.06% with correlation coefficient $R$ = 0.9949019. The growth model it followed is

$$C(y) = 815.6847 \cdot (1 + 0.070646)^{y-1955} \text{ thousand establishments.}$$

The breakpoint year when the corporation population entered this brief high-growth-rate spurt corresponds in time with the passage in 1954 of Subchapter S of Chapter 1, section 1372, of the Internal Revenue Code, which established the S Corporation as a legally recognized business entity. It is known that some significant number of proprietorships and partnerships applied for and received new recognition by the IRS as S corporations within a year of the establishment of this code. This brief high-rate spurt leveled off to a 4.27% annual growth rate beginning in 1960 and continuing until 1970 with a correlation coefficient of $R$ = 0.9953528 and a fitting function of

$$C(y) = 1.152658 \cdot (1 + 0.042681)^{y-1960} \text{ million establishments.}$$

Financial performance by each of the three types shows marked differences. Figure 11.13 displays business receipts and net profits for the three establishment types from 1939 to 1970. Not surprisingly, corporations show the largest business receipts, although whether this is inordinately due to the relatively few very large "battleship" corporations or not cannot be determined from this statistical series. What is clear is the corporation revenues snaked upward in an undulating pattern at a slope of about $33 billion (or roughly 5.2%) per year. The graph is clearly not that of a natural growth process. It instead appears to follow a planned forced advancement, i.e. it seems to be following a planned growth rate rather than a naturally-occurring one. This would be consistent with corporations having planned sales and market share targets for their products. In any case, business receipts for corporations grew faster than inflation throughout $M_4$. Profits, however, were another thing. Corporation profits stuck to a rough, noisy oscillation behavior with effectively only a net sideways or slightly upward motion. This means corporation profits did manage to keep pace with inflation, but did not show much real growth over wide spans of years. Profit performance divides into three general oscillating bands:

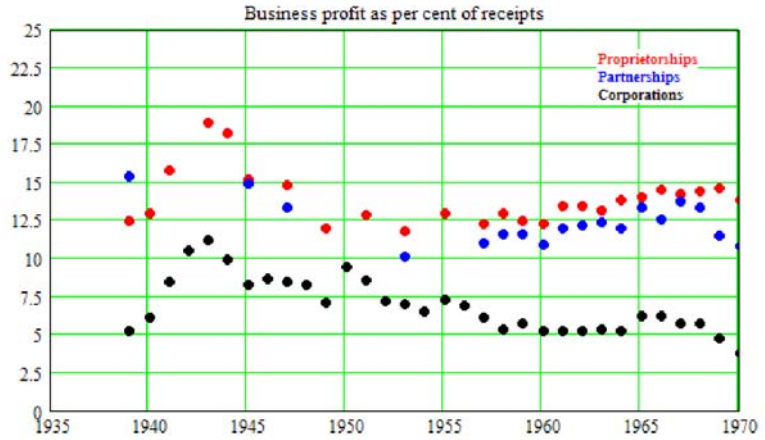



**Figure 11.14:** Calculated ratios of net profit to business receipts expressed as per cent of business receipts.

1. 1941-49 with average profit $44.6 billion 1967 dollars and a standard deviation of $5.71 billion;
2. 1950-64 with average profit $53.8 billion 1967 dollars and a standard deviation of $6.11 billion; and
3. 1965-69 with average profit $79.0 billion 1967 dollars and a standard deviation of $4.19 billion.

There is a stern demerit that accompanies and ties to the managed results, which I will get to after discussing the other two types' performances.

Proprietorships ranked second in both business receipts and net profits. Here no compelling evidence of natural growth or decay is evidenced in either receipts or profits. Business receipts reached a gently undulating steady state in 1957, averaging $202.3 billion 1967 dollars with a standard deviation of $8.974 billion. This is roughly one-fifth the mean business receipts of corporations over this period. Thus, business receipts matched inflation but showed no real net growth. Proprietorships achieved a mildly undulating uptrend in net profits of about $75 million 1967 dollars per year from 1953 to '57, i.e., net profits outpaced inflation but did not exhibit a natural growth rate pattern. This again implies actively managed profit growth.

Partnerships also failed to exhibit any natural growth rate process pattern. By 1963 business receipts had settled into a more or less flat steady state with an average of $80.3 billion 1967 dollars and a standard deviation of $1.06 billion. Net profits, however, had settled into undulating steady state by 1953 with an average of $10.1 billion 1967 dollars and a standard deviation of $574 thousand.

The overall business picture becomes very interesting when one compares net profits as per cent of business receipts. Figure 11.14 provides this data. Following the transient of World War II, from 1950 to 1960 proprietorships achieved a more or less reliable return of about 12.5% profit-to-business receipts, which matched the performance they exhibited at the end of the 1930s before the war began for the United States. After 1960, proprietorships managed to increase this ratio in an undulating 0.2% per year uptrend to just under a 15% ratio by 1969. From at least 1957 until 1968, partnerships also matched this uptrend at a slightly lower level. On the other hand, from 1945 until 1968 corporations chronically achieved an undulating declining trend that saw this ratio drop from around 8% down to just over 5%. This can only mean that managers of corporations did a poorer job of managing: (1) the greater resources at their disposal; or (2) the people employed by the establishment; or (3) both. It seems that Harry and Mabel are much better resource managers than the so-called professional managers of the corporate world.

**Table 11.1: Taxonomy of Occupations**

1970 Census Bureau Occupation Classifications, Subclassifications, & Populations (in thousands)

| Profession, Technical & Kindred Workers | Farmers & Farm Managers | non-farm Managers, Officials & Proprietors | Clerical & Kindred Workers | Sales Workers | Craftsmen, Foremen, & Kindred Workers | Operatives & Kindred Workers | Private Household Workers | Other Service Workers | Farm Laborers & Foremen | Laborers, non-farm or mine |
|---|---|---|---|---|---|---|---|---|---|---|
| (11,561) | (1,428) | (6,536) | (14,208) | (5,625) | (11,082) | (14,335) | (1,204) | (9,047) | (1,022) | (3,751) |
| accountants & auditors (712) | farmers (1,286) | buyers & dept. heads (387) | library assts. & attendants (126) | advertising agents (64) | carpenters (922) | deliverymen (643) | laundresses (12) | attendants, hospital, etc. (746) | foremen (83) | longshoremen & stevedores (47) |
| social & welfare (221) | farm managers (61) | public admin. officials (248) | bookkeepers (1,572) | hucksters & peddlers (122) | electricians (483) | dressmakers, seamstresses (102) | housekeepers (105) | practical nurses (242) | laborers (808) | lumbermen, raftsmen (89) |
| draftsmen (221) | | construction (399) | cashiers (869) | insurance agents & brokers (460) | mnfc'g foremen (938) | filer, grinder, or polisher (123) | household workers (1,087) | barbers, beauticians, etc. (650) | family workers (94) | mnfc'g laborers (349) |
| engineers, technical (1,230) | | mnfc'g (760) | mail carriers (256) | newsboys (65) | painters, const. & main. (359) | meatcutters (205) | | charwomen & cleaners (461) | | blastfurnace, steelworks, & mills (43) |
| lawyers & judges (273) | | wholesale trade (312) | secretaries, stenos. & typists (3,914) | real estate agents & brokers (255) | linemen & servicemen (397) | mine operatives (164) | | cooks (873) | | construction (645) |
| nurses, professional (841) | | retail trade (1,122) | telephone operators (420) | stock & bond salesmen (99) | machinists (390) | sawyers (108) | | watchmen, doormen, & guards (329) | | transport., commun. & utilities (105) |
| medical doctors (282) | | bank, fin., real estate, & insur. (214) | office mach. operators (571) | mnfc'g. (419) | auto mechanics (936) | bus drivers (293) | | policemen & detectives (378) | | wholesale & retail trade (96) |
| technicians, medical & dental (264) | | repair service (196) | shipping & receiving clerks (427) | wholesale trade (650) | other mech. & repairmen (1,135) | taxi drivers & chauffers (158) | | janitors & sextons (1,274) | | public admin. (95) |
| technicians, testing (471) | | personal services (225) | bank tellers (253) | retail trade (2,845) | plumbers & pipefitters (398) | truck & tractor drivers (1453) | | waiters & waitresses (1,100) | | |
| personnel & labor relation (296) | | all other industries (245) | other clerical & kindred (5,514) | other industries (244) | other craftsmen (996) | welders & flame cutters (566) | | other service workers (2,168) | | |

## § 4.2 Occupation Classes in $M_4$ as Per Cent of Employed Civilian Labor Force

At the end of $M_4$ in 1970 the employed U.S. civilian labor force consisted of 79.8 million people (age 16 and above) out of a total U.S. population of 204.9 million people. People's types of occupation within the divisions of labor in an industrial Society is one possible basis for the definition of mini-Communities even if all people in a specific occupation do not know each other. This is because commonalities in their labor employments tend to produce commonalities of personal interests and often evoke personal empathies for others "who are just like me" even when these others are strangers and the empathizing person is stereotyping all of them "in his own image." For example, I have a fondness for plumbers because I had an uncle and have a cousin who were plumbers. Similarly, I have a fondness for bakers because my father was a baker and for a time in my youth I, too, was a baker before I went to college. Indeed, managing my baked goods business when I was a lad provoked my interest in studying economics in college – which in turn bequeathed to me a basic attitude of friendliness towards economists. Personal experience is a powerful forge of mini-Communities.

Nonetheless, the task of defining mini-Communities on the basis of occupation faces some formidable challenges in taxonomy comparable to those difficulties biologists have to confront in devising classification systems for categorizing diverse forms of life. Table 11.1 is an abridged version of the occupational taxonomy employed by the Census Bureau for classifying people in the employed civilian labor force in $M_1$ through $M_4$ [Bureau of the Census (1976) Series D 233-682]. This classification system is used in this section and the next as the preliminary basis for some possible mini-Community definitions. As will be demonstrated, economic data can be used to test whether the classification is consistent with the idea of the corporate personhood of a mini-Community association. The Census Bureau's taxonomy identified 438 distinct occupations, which were then grouped into 11 classes. In turn, I have collected these 11 classes into three major occupational groups for display purposes in this treatise. The first data considered is the population size of these 11 major classes in population terms (counted in thousands of people) and in terms of per cent of the employed civilian labor force. Table 11.1 provides headcount data. Figure 11.15 graphs the three major defined groups in terms of per cent of labor force.

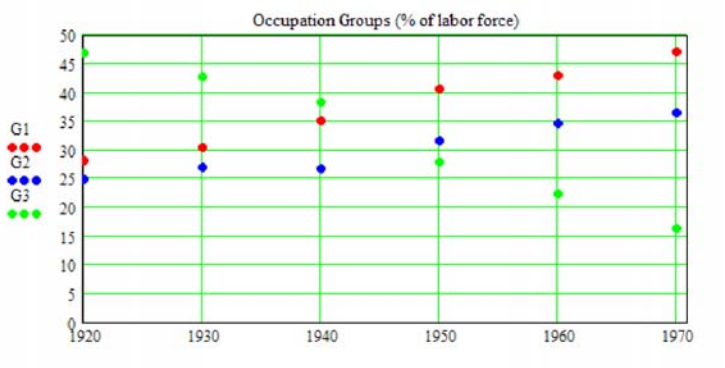



**Figure 11.15:** Occupation groups as per cent of civilian labor force from 1920 to 1970. Source: Bureau of the Census (1976) Series D 233-682. Key: G1 = group 1; G2 = group 2; G3 = group 3. For definition of these groups see text below.

My definition of the three major groups, while primarily motivated by an objective of keeping the data presentation simple to comprehend, is based on preliminary guesses about which of the occupation classes defined by the Census Bureau in Table 11.1 might be similar enough in the characters of their populations to possibly form a "superclass" mini-Community. One of the basic challenges for empirical social-chemistry is in identifying which sets of mini-Communities overlap sufficiently that each constituent mini-Community shares enough common interests with the others to provide sufficient conditions under normal circumstances to bond with one another at a more abstract level of social contract. The guesses are mathematical fiats, but ones that can be subjected to testing later to look for evidence of common Community among the groups. This is part of the necessary process of seeking out mathematical principal quantities connecting the ideal world of mathematical analysis with the empirical world of real experiences, as required by Critical metaphysics proper [Wells (2011c)].

**Group 1** consists of the operatives, clerical, and service occupation classes from Table 11.1. This population totaled 37.59 million workers in 1970. Figure 11.15 traces the per cent of labor population comprised by this group in decennial years 1920 through 1970. Here we find strong evidence that from 1930 to 1950 this group did comprise a superclass mini-Community because the population percentage presents a natural growth process characteristic. The correlation coefficient during this period is $R = 0.9999939$ with a model fit

$$G_1(y) = 30.39083 \cdot (1 + 0.014571)^{y-1930} \%, \quad y \in [1930, 1950].$$

However, the period afterwards, from 1950 to 1970, fails to exhibit the character of a natural growth process ($R$ value less than 0.990). There are a number of possible implications for this. One, of course, is that the apparent superclass mini-Community dynamics from 1930 to 1950 is simply a mathematical illusion. Another is that social and/or economic conditions changed over time until at least one of the constituent members of Group 1 broke away from the others and ceased to be a part of an original superclass mini-Community. This second possibility illustrates an important point: *mini-Communities are not necessarily permanent*. They form and break apart over time. This has profound implications for any science of taxonomy tasked with keeping track of current and past mini-Community associations. Indeed, the history of the Statistical Abstracts and other economic and business reporting documentation shows this implicitly: the occupation classes of Table 11.1 used by the Census Bureau in 1970 were replaced by a new definition of occupational classes, based on the North American Industry Classification System (NAICS), in 1997. The American Revolution was itself an example of one mini-Community (the American colonies) breaking away from a larger one (the British Empire).

Another possibility is that the superclass mini-Community, or some subset of it, has come under external hindrances restricting its members' exercise of their civil liberties, and their mini-Community is breaking down under the pressure of the challenge. One example that comes easily to mind is the practice known as "union busting." In 1892 Andrew Carnegie conspired with his partner, Henry Clay Frick, to break the Amalgamated Association of Iron and Steel Workers at Carnegie Steel's plant in Homestead, Pennsylvania. They proceeded to do precisely this, despite Carnegie's frequent previous writings and speeches about the benefits of workers' organizations and the lack of any fundamental issues capable of separating "labor" and "management." The Homestead strike turned violent, a number of people were injured and killed, and in the end the union was broken. In the aftermath, Frick himself was shot and stabbed by an anarchist, a man unconnected with the union or with Carnegie Steel, who barged into Frick's office without warning. His actions were apparently provoked by his radical anarchist's ideals and a personal sense of outrage over the Homestead strike. Frick recovered but Carnegie's reputation as a friend of the working man never did. Neither did the Amalgamated.

Union busting was nothing new in 1892 within America's social environment of uncivic free enterprise. Incidents like this one are a major factor in the present-day enmity often found between so-called "labor" factions and so-called "management" factions (a false division, in fact, because both factions perform "labor" in the social-natural context of Critical economics). When agents of the political government stand by and allow such incidents to happen or, as historically has sometimes been the case, take sides with one faction against the other, it is a dereliction of Duty, and an enormity committed against the American social contract, on the part of agents of government (in the Homestead case, the state government of Pennsylvania) because it is a failure to act in accordance with the sixth general objective of American government – namely, the objective "to secure the blessings of (civil) liberty to ourselves and our posterity" *for every citizen of the United States of America*. As I said earlier, the challenge of mini-Communities is the great challenge every system of government is forced to face.

**Group 2** consists of the professional & technical, managers & officials & proprietors, and craftsmen & foremen occupation classes from Table 11.1. This population totaled 29.18 million workers in 1970. Examining the data graphed in figure 11.15, Group 2 fails to exhibit any natural growth process characteristics over any period covered by the decennial sampling points (all correlation coefficients fall below the 0.990 threshold level). As I will show below, in the case of Group 2 this is because only one of its constituents exhibits a natural growth process and this only from 1950 to 1970. The Census Bureau classifications in two cases *do not* identify mini-Communities. At face value, one would think "professional & technical" occupations ought to be occupations with a great deal in common with each other, and 1950-'70 data agrees. The classification includes such divers occupations as accountants & auditors, draftsmen, engineers, medical doctors, and people who work in personnel departments or in labor relations. This occupational class is broad-based, so this result is remarkable. Examination of the data shows a different case for the managers, officials & proprietors class. The nature of the work performed by the different occupations within it is simply too diverse to bind the entire population in *common* occupation-related interests all share. The case of craftsmen and foremen on the other hand is more of a puzzle and requires a deeper study. Perhaps the occupation class is too diverse for common interests to be found, but I tend to doubt this and I do not exclude as a possibility that this occupation class is either chronically confronted with hindrances to their civil liberties or is inappropriately managed within their organizations. I do know from my own first-hand experience managing a large factory's technical staff that in many organizations craftsmen are badly misemployed doing tasks for which they are overqualified and badly underemployed in tasks that suit their training and preferences. Foremen are often ignored by higher management, which has always struck me as fair-sized stupidity on the part of those managers. A foreman knows a lot more about his operation and people than the general manager will ever know.

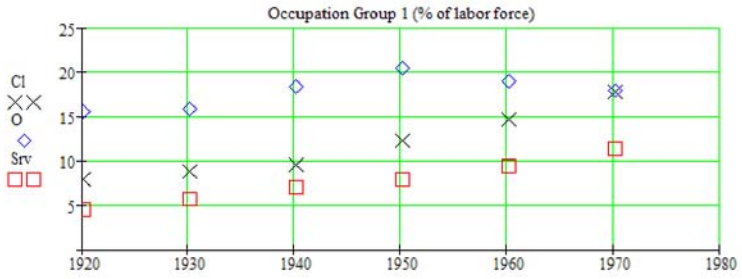



**Figure 11.16:** Occupation Group 1 constituents as per cent of employed civilian labor force. Key: Cl = clerical workers; O = operatives; Srv = service workers.

**Group 3** consists of five occupation classes: farmers and farm managers; sales workers; private household service workers; farm laborers; and non-farm laborers. This population totaled 13.03 million workers in 1970. Despite the seemingly obvious differences between these sets of occupations, from which one might assume they could have nothing in common and no common interests, Group 3 has exhibited the hallmark characteristic of a superclass mini-Community throughout the period from 1920 to 1970. However, in the case of this group it is a process of natural *decay* rather than natural growth that is displayed. It is a superclass mini-Community undergoing Community **economic extinction**.

Group 3 exhibits two periods of natural decline connected by a transition decade from 1940 to 1950. Its model fits are:

$$1920-40: \quad R=-0.9990923; \quad G_3(y)=49.91706\cdot(1-0.01010110)^{y-1920}\ \%;$$
$$1950-70: \quad R=-0.9954551; \quad G_3(y)=28.41670\cdot(1-0.02639170)^{y-1950}\ \%.$$

Marketable skills of personal enterprise are something over which technology exhibits a direct and often overpowering effect. It is one of the places in the social environment of a Society where new discoveries and inventions have the impact of effecting social changes. This is why not only the skills of enterprise function but also the heuristics of technique functions are necessary in the institution of public instructional education [Wells (2012b), chap. 7-8]. Recognition of the fact of this need has been slowly dawning upon agents of the general government and in some segments of the general population of the United States in the past couple of decades, but recognition of what the true need actually is has not been widely achieved. The political issue is phrased today as "job retraining," but this is the same error that was made in the Gilded Age of the 19th and early 20th centuries when it was called by such names as the "industrial arts movement" or the "vocational education movement." As I have already pointed out in chapter 9, §1, *capital* skill and not "job skill" is the necessary objective of public education. Let us not be 21st century Luddites on the topic of technical change. *Almost all job skills in the division of labor eventually become obsolete and economic demand for them disappears*. When was the last time you saw a help-wanted ad for a skilled wagon wheel maker? Group 3 in epoch $M_4$ is the poster group for this *social-natural law of economics*.[9]

Figure 11.16 breaks out the constituent occupation classes for Group 1. All three classes exhibit natural growth characteristics (natural decay in the case of the operatives class) from 1950

[9] You might assume I'm only talking about public schools here, but I'm not. Every business Enterprise, as the Community of a corporate person, has a corporate-self interest in capital skills education of its work-force. This, however, is something the less-than-competent hired-help managers who run most of America's large corporations chronically fail to understand, and thereby fail in fulfilling their Duties to the Enterprise.

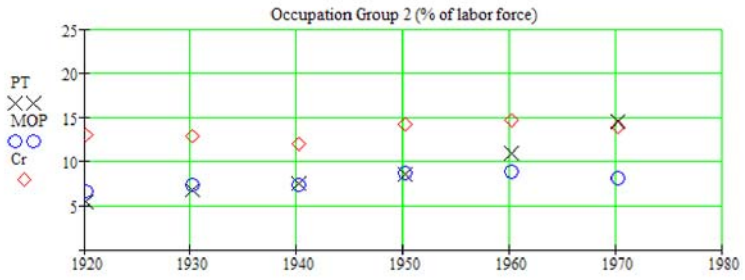



**Figure 11.17:** Group 2 constituents as per cent of employed civilian labor force. Key: PT = professional & technical workers; MOP = managers, officials & proprietors; Cr = craftsmen.

to 1970, and in the case of the clerical class this is exhibited from 1940 to 1970. The model fits are:

$$\text{clerical}: R = 0.9972069; \quad Cl(y) = 9.770194 \cdot (1 + 0.020443)^{y-1940}\ \%;\ y \in [1940, 1970);$$
$$\text{operatives}: R = -0.9969241; \quad O(y) = 20.34218 \cdot (1 - 0.0062387)^{y-1950}\ \%;\ y \in [1950, 1970);$$
$$\text{service}: R = 0.9995502; \quad Srv(y) = 7.874948 \cdot (1 + 0.018506)^{y-1950}\ \%;\ y \in [1950, 1970).$$

The change rates, *r*, in these fits illustrate that growth and decay in market demand for specific occupations can be, and often is, quite gradual. This is one reason why it is so easy to mistake job skill importance for capital skill importance. In 1970 the slow extinction of demand for metal filers, grinders, and polishers (a subset of the operatives class) had been in progress for two decades, but almost no one had noticed it. In the 2010 census this occupation class was no longer among those listed by the Census Bureau [U.S. Census Bureau (2011), table 616]; the nearest equivalent class (crushing, grinding, polishing, mixing and blending workers) *as a total group* made up less than half the percentage of the civilian labor force that filers, grinders and polishers by themselves constituted in 1970. The numerical totals were 90,000 workers in 2010 *vs*. 123,000 filers, grinders and polishers in 1970.

I trust you have not missed the following point: *Within a Society mini-Community formation and dissolution is a continually on-going process*. Even if at one epoch of a Society's *Existenz* a particular large-population mini-Community is correctly recognized, there is nothing in this that sets any guarantee this mini-Community will be in *Existenz* at all in some later epoch. Most mini-Communities certainly did not exist in earlier Society if one goes back far enough in time. The preservation of mini-Communities is in no way necessary for the preservation and maintenance of a Society. Let them naturally come into being, let them naturally fade away, and respect them under the social contract for as long as they exist; that is all any great Society can do.

Figure 11.17 shows the break out of the occupation classes making up Group 2. A superficial glance at the figure could suggest that the craftsmen and the managers-officials-proprietors classes, while obviously not exhibiting either natural growth or natural decay, might be instead in an undulating condition of static equilibrium. The data for the period does not rule this out. Unfortunately, changes in reporting in the Statistical Abstracts after 1970 have made it impossible for me thus far to study the consequent trends and behaviors of these classes in a comparable analysis. What "nearby" data I have rooted out so far, however, inclines me to think that what we actually are seeing in figure 11.17 is evidence that at least the managers-etc. class is not a mini-Community at all. This, however, is a postulate, not a finding. I commented previously on the craftsman class. As for the professional & technical workers class, analysis reveals the character of a natural growth process is occurring from 1950 to 1970 but not for 1920 to 1940. The data fits

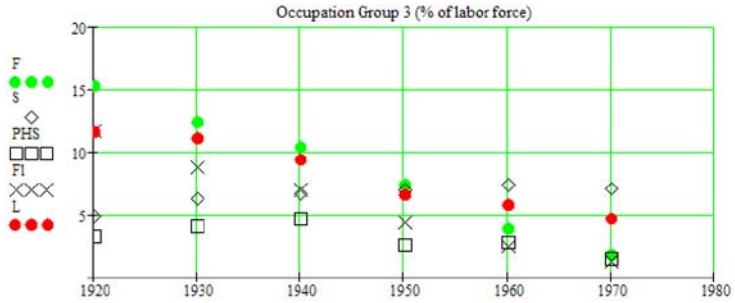



**Figure 11.18:** Group 3 constituents as per cent of employed civilian labor force. Key: F = farmers and farm managers; S = sales workers; PHS = private household service workers; Fl = farm laborers; L = non-farm laborers.

a model for 1950 to 1970 with a fitting function,

$$\text{professional \& technical}: R = 0.9994463; \quad PT(y) = 8.556935 \cdot (1 + 0.026463)^{y-1950}\,\% .$$

I commented earlier on the breathtaking technical changes that took place in the post-war years. These were much broader than merely industrial in scope. Discoveries led to advances in medicine and an explosion of new consumer products. An explosive increase in merger activity led to more complex corporate entities, and all these things naturally demanded more professional and technical people to sustain them. The labor force at large responded to this demand. The 1950s and early 1960s were a marvelous time to be a boy growing up in the midst of all this change. I remember well the awe and wonder the era inspired in me, and from the comments I heard adults constantly making, the awe and wonder it inspired in them as well. I have never personally seen its like in all the years since even though I have spent my career working at the very epicenter of the technological revolution it provoked. My students today have never known a world not powered and dominated by electricity; I have.

Figure 11.18 shows the break out of the occupation classes making up Group 3. Four of the five occupation classes exhibit natural decline or, in the case of sales workers, growth rates from 1950 to 1970. The growth class, sales workers, exhibits natural growth from 1930 to 1970. Only one class, private household service workers (PHS), does not exhibit a natural growth or decay property from 1950 to 1970, and this group exhibited a natural growth process characteristic from 1920 to 1940. The model fits are:

$$\text{farmers \& etc.}: \quad R = -0.9986895; \quad F = 15.21287 \cdot (1 - 0.0191173)^{y-1920}\,\% \quad y \in [1920, 1940];$$

$$\text{farmers \& etc.}: \quad R = -0.9985350; \quad F = 7.565469 \cdot (1 - 0.0682444)^{y-1950}\,\% \quad y \in [1950, 1970];$$

$$\text{sales}: \quad R = 0.9981105; \quad S = 6.318758 \cdot (1 + 0.005279)^{y-1930}\,\% \quad y \in [1930, 1970];$$

$$\text{PHS}: \quad R = 0.9912111; \quad PHS = 3.3383132 \cdot (1 + 0.016791)^{y-1920}\,\% \quad y \in [1920, 1940];$$

$$\text{farm laborers}: \quad R = -0.9980253; \quad Fl = 11.59131 \cdot (1 - 0.025357)^{y-1920}\,\% \quad y \in [1920, 1940);$$

$$\text{farm laborers}: \quad R = -0.9971595; \quad Fl = 7.344378 \cdot (1 - 0.0546117)^{y-1940}\,\% \quad y \in [1940, 1970];$$

$$\text{laborers}: \quad R = -0.9996758; \quad L = 6.563743 \cdot (1 - 0.01668288)^{y-1950}\,\% \quad y \in [1950, 1970].$$

Following World War II, private household service workers quickly became a vanishing occupation. One might speculate on the causes of this. The demand for housekeepers did not

vanish as a consequence of the war, but today there are many small companies that provide this service and only a tiny fraction of the U.S. population today employs a private household staff. There is also a much smaller fraction of the U.S. civilian labor force engaged in this occupation. The private household service classification had disappeared altogether by the 2010 census.

'Farm laborers' also continued its trend towards occupational extinction and vanished from the 2010 census completely. 'Non-farm and non-mine laborers' is no longer designated as a specific major occupation class in the Census Bureau's classification system although the occupation "laborer" still does appear as a specific type of occupation *under* a different occupational class in the 2010 census. 'Farmers and farm managers' is no longer a major occupation class in the 2010 census either. This group has been reassigned under two different occupation classes: (1) farmers and ranchers under 'management, professional, and related occupations'; or (2) farming occupations that were combined with fishing and forestry in a category called 'farming, fishing, & forestry occupations' in the 2010 census.

In 1970 there were 1.428 million farmers and farm managers along with 1.022 million farm laborers and foremen counted in the census; in 2010 the entire population of the new occupation category totaled 987,000 'farming, fishing, & forestry' workers plus 1.083 million farmers and ranchers listed under 'management, professional, and related occupations.' According to census figures, in 1970 there were 1.103 million acres of farmland with an average of 373 acres per farm, and there were 2.954 million farms[10]. In 2010 there were 920 thousand acres of farmland with an average of 418 acres per farm, and there were 2.201 million farms. In 2007, of the 2.205 million farms in the U.S., 85,837 of these were family held corporate farms, most of them S corporations with the majority of these having 10 or fewer stockholders. There were 10,237 non-family farm corporations, most of these likewise S corporations with 10 or fewer stockholders. Farming become both technologically and legally a more complicated business enterprise during and after $M_4$.

### § 4.3 Annual Earnings by Industry Class in $M_4$

The Census Bureau makes its own specialized use of the word "industry." It uses this term in contexts that refer to commercial entities that are similar enough to one another in terms of products, consumers of the products, methods of sales and distribution, and the kinds of raw materials consumed in their operations to be classified as species of a common genus. This genus is called the particular "industry." The next series of data presents average annual earnings by individuals grouped by the class of industry in which they are employed. The data source is Bureau of the Census (1976), Series D: 722, 739, 740, 741, 745-46, 751-54, 757, 760, 762-64, 807, 810, 879, 882, 885, 888, 891, 913, and 918-920. For display and analysis purposes, I group the twenty-eight industries covered by this data into seven superclasses according to broad type of product produced or service provided. This is similar to Douglas' categories of payroll industries.

Table 11.2 presents the classification system by which I have organized and presented earnings data in this section. Class IV differs from the other classes presented. It covers non-supervisory workers in various industries and presents data on their average weekly earning expressed in 1967 dollars. This is done in order to attempt to provide some continuity with and a reference for earlier earnings data presented for $M_1$ and $M_2$ from 1890 to 1926. The column headings in table 11.2 identify the general nature of the industries whose workers are included in that particular industry category of occupation. Engineers were included as a part of Class I. This is not because all engineers are employed in manufacturing industries; that is not true. However, earnings by engineers as a group tends to most well represented by manufacturing industries.

[10] which raises the not-uninteresting question of who was farming the roughly half-million farms in excess of the number of farmers, farm managers, farm laborers, and farm foremen.

**Table 11.2**
1930-1970 CATEGORIES FOR AVERAGE ANNUAL EARNINGS PER EMPLOYEE BY INDUSTRY

| Class I | Class II | Class III | Class IV | Class V | Class VI | Class VII |
|---|---|---|---|---|---|---|
| Manufacturing industries | Mining | Non-manufacturing industries | Nonsupervisory workers (weekly earnings) | Education | Medical, dental & legal services | Other |
| All full time employees (FTE) | average of mining workers (Mine) | all construction workers avg. (Cons) | contract construction (CC) | educational services (ES) | all medical & health services (MHS) | state & local government (SLG) |
| manufacturing (Mnf) | anthracite coal (AC) | gas & electric utilities (EU) | wholesale trade (WT) | government educ. services (GES) | physicians (MD) | federal government (Fed) |
| durable goods (DG) | bituminous coal (BC) | wholesale & retail trade (Tr) | retail trade (RT) | instructional staff (PST) | dentists (DDS) | agriculture, forestry & fishery (AFF) |
| non-durable goods (NDG) | metals (Mtl) | finance, insurance & real estate (Fire) | electric utility worker (EUW) | college professors (Prof) | lawyers (Law) | |
| engineers (E) | | | Fire industry worker (FIR) | | | |

Note: Class IV data for non-supervisory workers is given as weekly earnings to provide a reference to 1890-1926 earnings data

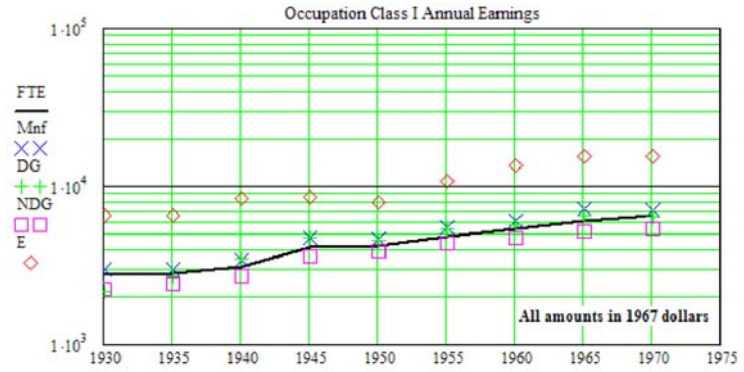



**Figure 11.19:** Class I annual earnings in 1967 dollars per year. For key see table 11.2. Mnf = all manufacturing.

With a few exceptions, the data taken across the seven classes reveals interesting regularities. All but a few classes exhibited characteristics of a natural growth process over some interval in $M_4$. The exception cases are interesting. In the majority of cases, the data indicates that 1955 to 1965 was the interval where natural growth was exhibited, and that a definite breakpoint occurred in 1965. The mining class is interesting because the class as a whole exhibits the character of a natural growth process but *none* of its constituent industry groups do except for a ten year period (1955 to 1965) by the metals group. All groups in all classes demonstrate earnings gains in excess of inflation rate up to 1965.

Figure 11.19 presents the data for Class I, the manufacturing class. It also includes a reference line (FTE) provided by the average earnings over all industries and all full time employees. FTE earnings exhibits a natural growth characteristic for the period from 1950 to 1965 with a distinct break in the trend between 1965 and 1970. This break corresponds in time with the beginning of major violent episodes marking the start of the national period of civil war over civil rights and the war in Vietnam. This was a period of nationwide domestic conflict marked by major riots in the cities, political assassinations, and thousands of protest demonstrations – in many of which violent confrontations occurred between demonstrators and police or national guard units – that marred the next seven to eight years. This period of civil disorder culminated with the Watergate scandal, the resignation in disgrace of Richard Nixon, the loss of the Vietnam war, and the fall of South Vietnam to the armed forces of North Vietnam.

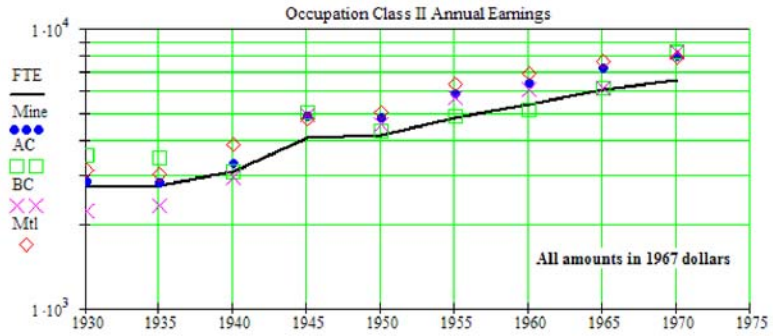



**Figure 11.20:** Class II annual earnings in 1967 dollars per year. For key see table 11.2.

The model fit for FTE annual earnings over the period from 1950 to 1965 is

$$\text{FTE}: \quad R = 0.9981353 \quad FTE(y) = \$4185.771 \cdot (1 + 0.024977)^{y-1950} \text{ in 1967 dollars.}$$

Among the constituent groups, neither the durable goods production workers nor the engineers exhibit the characteristic of a natural growth process. Best fit correlation for the DG group was $R$ = 0.98717104, while for engineers it was $R$ = 0.9815329, both of which fail to reach the empirical threshold for positing a natural growth process. Durable goods annual earnings slightly but consistently exceed the all-industries FTE average, while non-durable goods slightly but consistently underperforms FTE. It may be that the durable goods group does not constitute a mini-Community or, as I am more inclined to hypothesize, it might be that it constitutes a mini-Community chronically challenged by hindrances to it's members' civil liberties. However, the data at hand is not sufficient to resolve this question and it requires a deeper study.

As for the engineers group, I hypothesize that this group is constituted by multiple different mini-Communities, each with its own local interests independent of those of the others. Series D 256 through 264, the detailed occupation of economically active populations, lists 8 distinct classes of engineers plus a 9th "miscellaneous" class: civil, chemical, metallurgical and metallurgist, mining, electrical, industrial, aeronautical, and mechanical engineers. Engineers tend to associate themselves with a particular industry, with ignórance of other industries. They are rarely unionized, and a sizable fraction of each group does not belong to the recognized major professional society for its specialty.

As for non-durable goods production workers and all-manufacturing overall, both exhibit the characteristic of a natural growth process in the period from 1950 to 1965. The model fits are

$$\text{manufacturing overall}: R = 0.9955236 \quad Mnf(y) = \$4604.361 \cdot (1 + 0.029669)^{y-1950};$$
$$\text{non} - \text{durable goods}: R = 0.9986498 \quad NDG(y) = \$3877.785 \cdot (1 + 0.019922)^{y-1950}.$$

Manufacturing as an industrial genus exhibits the characteristic of a natural growth process but the durable goods production workers (DG) do not. Perhaps this could be an effect of wage-fixing practices of manufacturing industries, whereby wages offered are geared to published statistics on market-mean wages and salaries. Evidence of Smith's finding that "masters always act in combination to hold down the price of labor" is easy to find. But this fails to explain the NDG group, and so the DG group data might instead imply the *Dasein* of an industrial caste system.

Figure 11.20 presents the annual earnings data for Class II, along with the reference FTE line. At first glance it might appear that all three constituent groups (AC, BC, and Mtl) exhibit natural growth rates from 1950 to 1965, but closer examination of the data shows that all three fall below

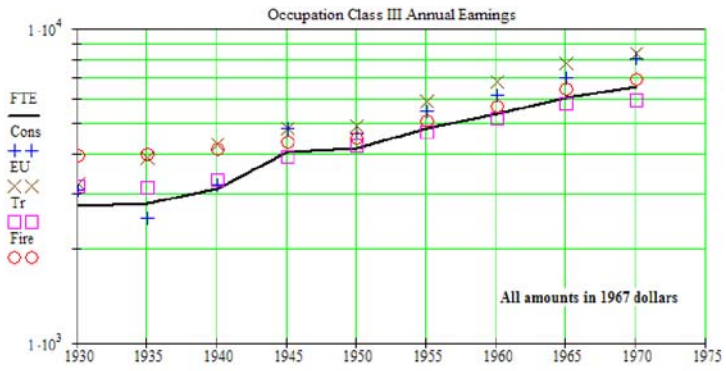



**Figure 11.21:** Class III annual earnings in 1967 dollars per year. For key see table 11.2.

the required correlation threshold of 0.990. However, there was a change in reporting by the Census Bureau put into effect in 1965 in which the earnings for the AC and BC constituencies were lumped into one figure (presumably because the mine worker population was becoming a very small fraction of the labor force by then). Even so, both groups fail to reach the required threshold in correlation in the preceding years. The metal miners' group, on the other hand, does exhibit the characteristic of a natural growth process over the period from 1955 to 1965. Its model fit is

$$\text{metal}: R = 0.9998122 \quad Mtl(y) = \$6323.41 \cdot (1 + 0.018854)^{y-1955} \text{ 1967 dollars per year.}$$

The mining industry as a whole, on the other hand, does exhibit a natural growth process from 1955 to 1970 with a model fit of

$$\text{Mining overall}: R = 0.9989269 \quad Mine(y) = \$5815.846 \cdot (1 + 0.021073)^{y-1955} \text{ 1967 dollars per year.}$$

It is possible this might be an effect of mine workers being strongly organized by the United Mine Workers Union or it could be indicative of the *Dasein* of an industry caste system.

Figure 11.21 graphs average annual earnings for the Class III non-manufacturing industries. The group as a whole averages slightly higher than the all-FTE average with the trade industry lagging slightly below it in $M_4$. All four groups exhibit characteristics of natural growth processes from 1950 to 1965 with a break in the trend in 1970. The model fits are:

$$\text{all construction}: R = 0.9965437 \quad Cons(y) = \$4685.256 \cdot (1 + 0.027354)^{y-1950} \text{ 1967 dollars per year;}$$

$$\text{utilities}: R = 0.9974133 \quad EU(y) = \$4966.845 \cdot (1 + 0.030483)^{y-1950} \text{ 1967 dollars per year;}$$

$$\text{wholesale \& retail}: R = 0.9999842 \quad Tr(y) = \$4222.795 \cdot (1 + 0.020767)^{y-1950} \text{ 1967 dollars per year;}$$

$$\text{finance \& etc.}: R = 0.9999076 \quad Fire(y) = \$4471.825 \cdot (1 + 0.024288)^{y-1950} \text{ 1967 dollars per year.}$$

Comparing the manufacturing (Class I) and non-manufacturing (Class III) industries, on the whole annual earnings are comparable with Class I as a whole growing at a slightly faster 2.97% annual rate *vs.* a Class III overall average growth rate of 2.60%. Overall average Class III performance from 1950 to 1965 is fit by the model

$$\text{Class III}: R = 0.9989838 \quad Class\ III(y) = \$4586.600 \cdot (1 + 0.026010)^{y-1950} \text{ 1967 dollars per year.}$$

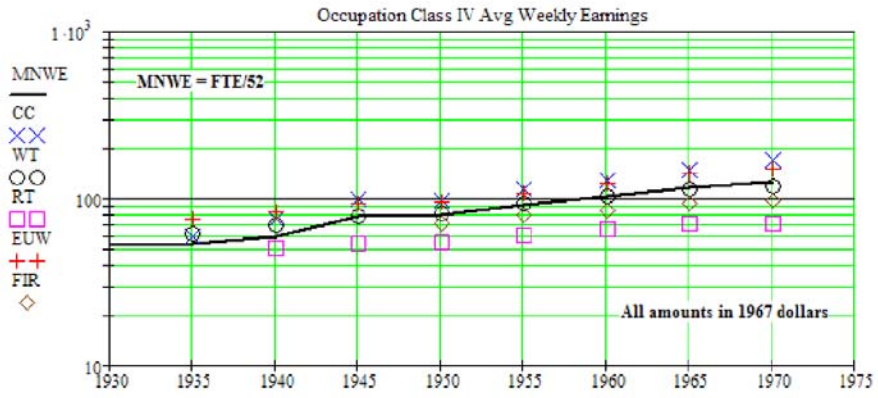



**Figure 11.22:** Estimated average weekly earnings for non-supervisory workers in various occupation groups. For the key see Table 2.2.

In both manufacturing and non-manufacturing industries the largest segment of the labor force is made up of non-supervisory wage earners primarily compensated on an hourly wage basis. Figure 11.22 shows the estimated weekly earnings of non-supervisory wage earners in the non-manufacturing industry class (Class IV). All five constituencies exhibit the characteristic of a natural growth process from 1950 to 1965 and all five show the trend break that occurs after 1965. Workers in the wholesale trade industry performed equally with the national FTE weekly average (MNWE in the figure). Workers in the retail trade and the finance, insurance & real estate group (FIR) underperformed the national earnings average. Workers in the contract construction (CC) industry and in utilities (EUW) outperformed the national average.

It is interesting to compare these workers with their counterparts in the durable goods (DG) and non-durable goods (NDG) manufacturing sectors and with average hourly earnings from payroll industries and unions in 1926. Even though DG workers, alone among the seven groups of non-supervisory hourly wage earners, do not exhibit the characteristic of a natural growth mini-Community, a statistical fit of their average earnings trend can be meaningfully compared to the others. In order to compare all groups, the data from figures 11.19 and 11.22 for the period from 1950 to 1965 are converted to equivalent hourly earnings. The results for the $M_4$ epoch, ordered from highest to lowest hourly earnings, are

$$CC(y) = \$2.436 \cdot (1.027630)^{y-1950} \quad \{R = 0.9983206\}$$
$$EUW(y) = \$2.377 \cdot (1.026546)^{y-1950} \quad \{R = 0.9995796\}$$
$$DG(y) = \$2.207 \cdot (1.023174)^{y-1950} \quad \{R = 0.9871704\}$$
$$WT(y) = \$2.042 \cdot (1.022292)^{y-1950} \quad \{R = 0.99499177\}$$
$$NDG(y) = \$1.864 \cdot (1.019922)^{y-1950} \quad \{R = 0.9983206\}$$
$$FIR(y) = \$1.772 \cdot (1.019061)^{y-1950} \quad \{R = 0.9913590\}$$
$$RT(y) = \$1.387 \cdot (1.016285)^{y-1950} \quad \{R = 0.9972904\}.$$

In 1926 the pooled typical group of payroll industry wage earners earned \$0.707 per hour, while for union workers the average hourly earnings were \$2.013. Payroll industry iron and steel workers earned \$1.202 per hour while clothing industry workers earned \$1.415 per hour. All amounts reported here are in equivalent 1967 dollars.

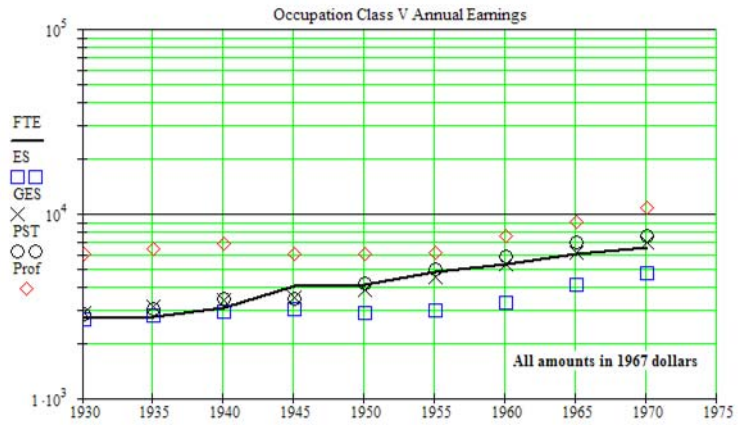



**Figure 11.23:** Average annual earnings for schooling and educational services providers. Also shown is the overall FTE average for all industries. Source: Bureau of the Census (1976) Series D 760, 763, 913, and H 524. For key see Table 11.2.

It is in part because non-supervisory hourly wage earners in durable goods manufacturing rank third in hourly earnings, with a statistical earnings growth rate indistinguishable from that of the wholesale trade (WT) population, and in part because it seems incongruent that DG production workers, alone among the seven populations, would *not* associate as a mini-Community, that I make the hypothesis the DG population constitutes a mini-Community who face hindrances to their civil liberty. What these might be cannot be determined from the earnings data alone, but the *Dasein* an industry-instituted caste system is one possibility that is not ruled out.

Turning next to providers of schooling and formal educational instruction, figure 11.23 graphs average annual earnings for the Class V occupation classes. Educational services (ES) is the broad collection of wage earners lumped under category 8200 of the Standard Industrial Classification system, a classification system begun in 1937 and replaced in 1997 by NAICS (the North American Industry Classification System). The ES data fails to exhibit characteristics of a natural growth process; its best model fit is the poorest of the 28 classes considered here ($R$ = 0.926430). This indiscriminate lumping represents no real human mini-Community.

Government education services (GES) and public school teachers (PST) both exhibit natural growth process characteristics from 1950 to 1965, and both exhibit a break in the trend after '65. Model fits for these occupation classes are

$$\text{GES}: R = 0.9993576 \quad GES(y) = \$3869.355 \cdot (1 + 0.032054)^{y-1950} \text{ 1967 dollars per year;}$$
$$\text{PST}: R = 0.9997570 \quad PST(y) = \$4179.645 \cdot (1 + 0.034503)^{y-1950} \text{ 1967 dollars per year.}$$

The series on college teachers (Prof) requires commentary. First, data from 1930 to 1950 was collected by the Census Bureau as mean-annual-salary data, while the data in the series from 1955 onward represents median salary data. Therefore these two series are not legitimately comparable and the analysis here can extend no further back in time than the year 1955. Median salary data is in any case more reflective of college teacher salaries given that the census data does not further break down salary data according to academic rank (instructor, assistant professor, associate professor, and professor). Between these ranks there is generally a significant gap in salaries, thus median rather than mean average is a better indicator of collegiate salary.

Second, from 1950 onward data was collected irregularly, leaving some gaps in the data record. In some cases it was necessary to apply statistical interpolation methods to estimate missing data points. I did this using a complex 12-factor modeling process. Interpolated data from

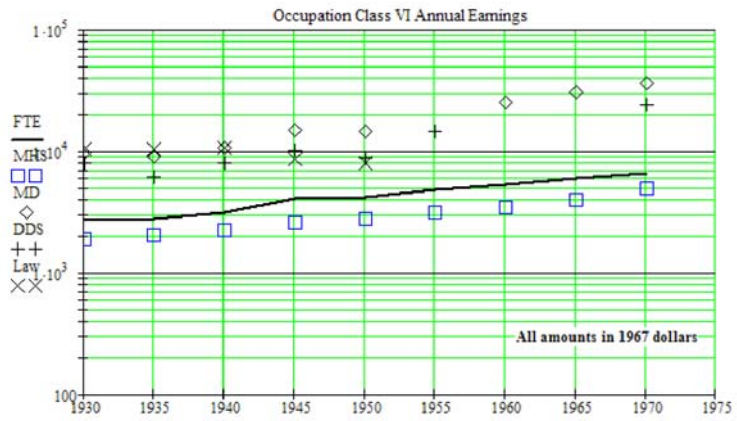



**Figure 11.24:** Average annual earnings for medical, dental, and legal services providers. Also shown is the overall FTE average for all industries. Source: Bureau of the Census (1976) Series D 757, 915/918, 916/919, and 913/914. For key see Table 11.2.

this process is believed to be accurate to within ten 1967 dollars per year to a high level of confidence (level of confidence greater than 95%). Where actual data was collected for a particular year, that data is used here. The outcome of all this analysis is that college teacher annual earnings exhibit the natural growth process from 1955 to 1965 with a definite breakpoint in the model occurring in the year 1966. For the sample points depicted in figure 11.23 the sampled data model fit[11] from 1955 to 1965 is

$$\text{college teachers}: R = 0.9994820 \quad \text{Prof}(y) = \$6202.028 \cdot (1 + 0.038996)^{y-1955} \text{ 1967 dollars.}$$

It can be concluded that college teachers, public school teachers, and government educational service workers each constituted mini-Communities in the time periods noted for the model fits.

Figure 11.24 graphs census data for annual earnings by workers in medical, dental, and legal services occupations. The source data for this series has many missing data points with the result that meaningful analysis could only be carried out for two groups: all medical & health services employees (MHS) and physicians (MD). Both of these, however, exhibit natural growth processes from 1950 to 1965 with definite trend breaks occurring after 1965. I conclude that both these groups likely do constitute corporate mini-Communities. The model fits are

$$\text{MHS}: R = 0.9984744 \quad MHS(y) = \$2764.200 \cdot (1 + 0.023640)^{y-1950} \text{ 1967 dollars per year;}$$

$$\text{Physicians}: R = 0.9982261 \quad MD(y) = \$14{,}714.24 \cdot (1 + 0.051321)^{y-1950} \text{ 1967 dollars per year.}$$

As for the last occupation class, figure 11.25 graphs the annual earnings data for the "Other" category – state and local government employees, federal government employees, and employees in the agriculture, forestry, and fisheries industries. Again, the FTE average line is included in the graph for comparison purposes.

All three represented groups demonstrate earnings growth consistent with a natural growth process over some time interval within the $M_4$ epoch. Both government sectors exhibit it for 1950

[11] The "sampled data fit model" is different from the much more complex 12-factor model. It is the latter, which was used to obtain data for model fit given here, that is accurate to within $10 per year. The models I present to you in this treatise are called "reduced order models" (which means they are simpler but still statistically legitimate models that pass tests for statistical indistinguishability from more complex ones).

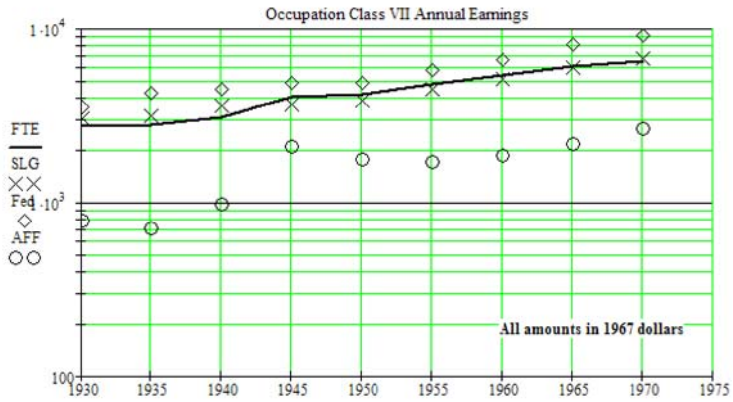



**Figure 11.25:** Average annual earnings for sectors in government and agriculture-forestry-fisheries. Also shown is the overall FTE average for all industries. Source: Bureau of the Census (1976) Series D 739, 762, and 764. For key see Table 11.2.

to 1965 with a definitive breakpoint following '65. Somehow it seems unsurprising that federal employees show higher earnings than state & local government employees. (The earnings in the Class VII group do not include teachers or educational workers). It is also unsurprising that state & local government employee earnings tightly match the national earnings average. People who choose to go into public service generally do not do so to make more money than the next guy, although they also don't go into it in order to make less money than the next guy. Model fits for these two groups from 1950 to 1965 are

$$\text{state \& local gov.}: R = 0.9997653 \quad SLG(y) = \$3872.178 \cdot (1 + 0.023640)^{y-1950} \text{ 1967 dollars per year;}$$

$$\text{federal gov.}: R = 0.9987306 \quad Fed(y) = \$4828.417 \cdot (1 + 0.034050)^{y-1950} \text{ 1967 dollars per year.}$$

The agriculture, forestry & fisheries group is rather more interesting. In the first place, it is a mild surprise that these three diverse industries should strongly exhibit the characteristics of a mini-Community, but that is what examination of the earnings records indicates. First, one can note that this group lags far behind the national average for annual earnings. From 1960 to 1970 the AFF group displays the characteristic of a natural growth process with a model fit

$$\text{AF \& F}: R = 0.9974393 \quad AFF(y) = \$1855.773 \cdot (1 + 0.034905)^{y-1960} \text{ 1967 dollars per year.}$$

One cannot look at figure 11.15 and fail to notice, however, the great jump in earnings this group experienced over the five year interval from 1940 to 1945. Examination of the earnings data on a year-by-year level reveals that this group was hard hit by the Great Depression, falling from an annual earnings level of $782 (in 1967 dollars) in 1929 to a low of $598 in 1933 before beginning its earnings recovery. What is remarkable about this group is that from 1940 through 1944 AFF earnings grew at an amazing rate of 19.4% per year and did so with a model fit of

$$\text{AF \& F}: R = 0.9988127 \quad AFF(y) = \$959.8248 \cdot (1 + 0.194339)^{y-1940} \text{ 1967 dollars per year.}$$

If ever there was a financial golden age for this group, 1940-1944 would have to have been it.

The statistics covered in this section and the previous one provide strong empirical evidence in favor of the postulate that people do form large if abstract mini-Communities of common interests along the lines of their occupational pursuits. It also demonstrates that such mini-Communities not only come into existence but also undergo extinction as socio-economic-

technological conditions change. The presence of stable national-average growth processes over divers time periods also demonstrates that actions taken by one group have both direct and indirect effects on other groups. Mini-Communities within a great nation are connected to one another through the Enterprise-protein effect of an interlocking free enterprise system. These connections can be competitive, and sometimes destructive to particular mini-Communities, and, as groups like agriculture, forestry & fisheries appear to indicate, they can sometimes be cooperative and synergistic. A labor union can benefit non-union wage earners, and the actions of non-union wage earners can act either to the benefit or to the disbenefit of union wage earners. The additional fact that every human being is simultaneously a member of more than one mini-Community adds additional complexity to the social-natural anthropology and sociology of people living together in a great nation. Here we see in the old metaphor of "the Ship of State" a more homely corollary: we really are all in the same boat.

## § 4.4 National Income by Industrial Sector in $M_4$

Personal earnings are why individual entrepreneurs undertake their enterprises of working at their chosen occupations. Corporate income is why individual entrepreneurs join forces with one another in an Enterprise. National income reflects the wealth-creating power of a nation's inter-locking network of Enterprises. Income defines whether or not Enterprise is being successful.

The census bureau defines **income** as the aggregate earnings of labor and property that arises from the current production of goods and services. The third series of data presented in this section presents national-level income data based on grouping Census Bureau industrial classifications into three general groups: Producers (Group A), Distributors (Group B), and Other (Group C). Table 11.3 below defines the broad industry classifications I have associated under each of these group designations. The Census Bureau's classification of the divers industrial entities in epoch $M_4$ is based on a system it describes as "similar to the U.S. Standard Industrial Classification System of 1957." The data source for the material presented in this section is from Bureau of the Census (1976), Series F 226-237.

The logic behind the threefold division depicted in table 11.3 is that of the basic structure of economics generally. The final destination of every economic good, whether it be a tangible good or a service provided, is consumption by a consumer, for whom the economic good constitutes a wealth asset. An economic good is called a "good" because it in some way satisfies a Desire on the part of the consumer who consumes it (i.e., it is "good for something"; this notion understands

**Table 11.3**
**Enterprise Industry Groups**

| Group A | Group B | Group C |
|---|---|---|
| Agriculture, Forestry, & Fisheries (AFF) | Wholesale and Retail Trade (WRT) | Services (SRV) |
| Mining (ME) | Finance, Insurance, & Real Estate (FIRE) | Government (GOV) |
| Construction (C) | Transportation (T) | |
| Manufacturing (MNF) | Communication and Public Utilities (CPU) | |

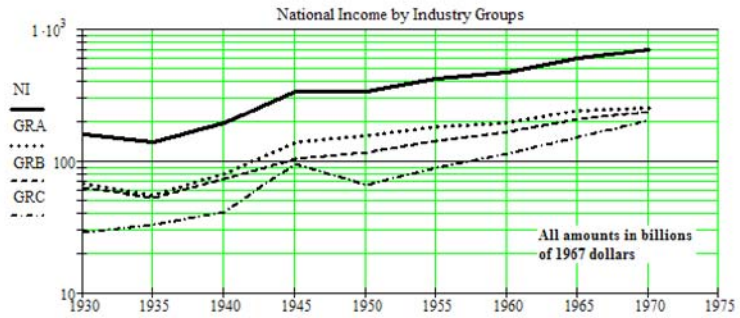



**Figure 11.26:** National income (in 1967 dollars) by industry Enterprise group from 1930 to 1970. Group A = producer industries; Group B = distribution and transportation industries; Group C = services & government; NI = national income. NI is the unweighted sum of the incomes of Groups A through C.

the idea of "utility" in economics). The consumer is said to *value* the economic goods he consumes. In the general division of labor, the raw materials of physical nature and human or animal labor must be transformed into the desired economic good (Group A). That good must generally be transported from where it is produced and otherwise made available for purchase by the end consumer (Group B). In some instances, the economic good provided is provided directly in the form of some service one person (either a real person or a corporate person) carries out for another person (either real or corporate). In this case we do not speak of a tangible good but, rather, of an intangible economic good, and this is represented by Group C.

This net system of producers, distributors, and service providers is necessary in an economy in which the division of labor is thoroughly established. Economic entities in each group are said to "add value" to the economic good in its journey from raw stock to final consumption because without their actions the complete transaction from initial production to final consumption cannot be completed. I remember that in the '70s I often heard managers and proprietors speak of the "value added" by the operations under their control. In the '80s I heard them use the term less and less, and by the '90s I rarely heard anyone use the term at all. This is not because the idea has become obsolete but because managers have over time become darkly ignorant of economics. That is one reason why most large corporations in the U.S. today are mismanaged.

Figure 11.26 overviews the general picture of U.S. national income from 1930 to 1970. Group A (the producers) barely showed any characteristics of a natural growth process throughout the duration of the period covered by the 5-year data sampling points. Only in the brief period from 1945 to 1955 does this group achieve a correlation coefficient above the threshold for positing a natural growth process, and this coefficient was only $R = 0.9920354$ with an annual growth rate of 2.78%. This means that as an overall group producer Enterprises do not form a producers' mini-Community. One consequence of this that is predicted by the mathematics of enterprise networks is that interactions among members of Group A will be generally competitive and non-cooperative. This should surprise no one; commentators who poetically hail the so-called virtues of Darwinian uncivic free enterprise speak often of the alleged good of naked competition, and these commentators almost invariably speak from a producer's context in presenting their views.

It went otherwise with the other two groups. Group B (distributors) exhibited a natural growth rate process from 1950 to 1965 with definite breakpoint occurring in '65. Group C also exhibited a natural growth process from 1950 to 1970 with no break-point observed in $M_4$. Model fits are

$$\text{Group B}: R = 0.9972116 \quad B(y) = \$116.5334 \cdot (1 + 0.037146)^{y-1950} \text{ billion} \quad y \in [1950, 1965)$$

$$\text{Group C}: R = 0.9993837 \quad C(y) = \$65.20024 \cdot (1 + 0.057929)^{y-1950} \text{ billion} \quad y \in [1950, 1970)$$

expressed in 1967 dollars. The fact that each group exhibited the characteristic of natural growth points to the hypothesis that each group constitutes an overall mini-Community. The importance of this is that it implies some tacit recognition between members of the group of a commonality of interests, which in turn implicates *cooperative* interactions among the group's membership. This should not be surprising to you if you consider the cooperations that regularly take place between, e.g., wholesalers or retailers and financial institutes such as banks. If so, the benefits of cooperation are clearly reflected in the comparison between the growth rates of these groups (3.71% and 5.79%) in comparison with the 2.78% growth rate briefly achieved by Group A, and even more in the comparison of the steady growth rate of Groups B and C in comparison to the irregular and sometimes even flat (no-growth) performances exhibited by Group A.

Growth in the Enterprise groups contributes directly to national income growth. This, in turn, reflects an increase in the wealth of the nation, which has the potential to benefit the general welfare of the national Community and all its citizens. This is, after all, why any group of people choose to join together in mutual association under a social contract in the first place, and one of the key factors in the establishments of civil Community. However, the fact that the most rapid growth rate was taking place in the service group (Group C) is a cause for some concern. It has become popular to the point of becoming a slogan to say the United States is "evolving into a service economy." The performance of Group C is the factual basis for this statement. A number of people commenting on this change in the economic environment seem to express an additional presumption, namely that since the service economy is growing it is unnecessary for the nation to persist in that part of its economic system that is based on the producers' group – e.g. manufacturing is unimportant to the future wealth of the nation.

This second supposition is utterly false. The technical explanation of why this is so would carry us far too deeply into the details of macroeconomics, but the general notion is easy enough to state in context. The basic factor that makes division of labor work is the precept that one should never make for oneself that which is cheaper to buy. The corollary to this is one should never buy that which is more expensive to purchase than it is to either make yourself or go without. Now, the endpoint of every *complete* economic transaction is the consumption of a *tangible* good. However, the economic good that a service provider provides is always an intangible good. Once the service is provided, that service cannot *itself* be exchanged again; the service is "used up" at the moment it is provided. This is the sense in which the economic good provided is said to be an intangible good.

Producers produce *tangible* economic goods. If a national economy cannot produce its own tangible goods, then it must either purchase them from an external supplier or go without them. But the external supplier is then in a position that is the dream of all monopolists, namely, that he can restrict the supply of tangible goods provided and thereby demand *and get* a greater quantity of whatever is exchanged for it. In a pure service economy, the only thing that economy can exchange is service – an intangible good. *The servers have to serve the supplier*. Tangible goods they need become "dearly bought" by having to provide a much greater quantity of service labor to purchase them. If the supply of service providers is much greater than the demand for their services by the external supplier – and every skilled monopolist will see to it that precisely this happens – then the service-providing population must either sell its services more cheaply or some large fraction of that population must do without the tangible good. One good example of this was the Arab Oil Embargo OPEC imposed on the U.S. in 1973-74 in retaliation for President Nixon sending military supplies to Israel during the October Yom Kippur War.

This is the general situation nations with so-called "third world economies" find themselves in. When medicine is too dearly bought, the population goes without medicine; when shelter is too dearly bought, the population goes without shelter; when food is too dearly bought, the population goes without food ("famine"); etc. *Producers are essential to the wealth of a nation*.

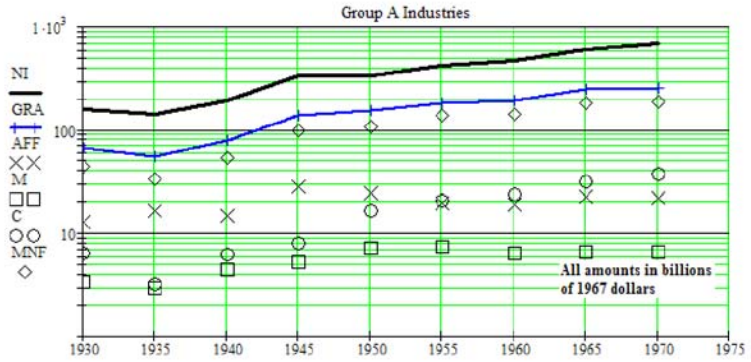



**Figure 11.27:** National income from Group A Industries in billions of 1967 dollars. NI = national income. GRA = Group A as a whole. For the rest of the key see table 11.3.

But it is easy for a people who are not aware of remote consequences of economic decisions to choose actions that appear to be immediately beneficial (to themselves) but which have disastrous macroeconomic consequences (for themselves) later. This is the case with short-sighted views of a service economy. In economics supply-and-demand situations are often described in terms of a measure called an "elasticity." There are many kinds of elasticities but they all follow the general formula

$$"x \text{ elasticity of } y" = \frac{\%\text{ change in quantity of } y}{\%\text{ change in quantity of } x}.$$

In 1969 Lipsey and Steiner wrote,

> The second set of observations shows clearly that income elasticities change only gradually over time. Over the last forty years, for example, the American income elasticity of demand for wheat and for most other food products has been observed to be less than unity and declining. We are thus very safe in predicting that a rise in income over the next ten years will be associated with a less than proportional increase in demand for these goods and that, unless the growth of agricultural productivity falls dramatically, the farm problem will be a continuing one. On the other hand, many service industries have encountered income elasticities that are well in excess of unity and rising over time. We do not expect these elasticities to drop suddenly to very low levels, and we are thus able to predict that, unless service industries achieve rates of productivity growth very much in excess of the national average, there will be a continuing pressure from the price system for more resources to move into the service industries. [Lipsey & Steiner (1969), pp. 187-88]

Both these predictions came to pass. One manifestation is "jobs being shipped to other countries." I often wonder why boards of directors of American corporations think foreigners will need *them* once they have established balanced producer-distributor-service economies for themselves. It certainly won't be for the keen wit and business acumen of U.S. directors and managers.

Turning now to the member Enterprises of the three groups, figure 11.27 presents the national income contributions of Group A. All four constituencies exhibited characteristics of natural growth at some point in epochs $M_3$ and $M_4$ but only two of these, mining and construction, exhibited natural income growth at the same period of time. Agriculture, forestry, & fisheries (AFF) arguably exhibited natural decline in income from 1945 to 1955. Technically speaking, the correlation coefficient for income decline does not quite reach the threshold of -0.990 but the tiny

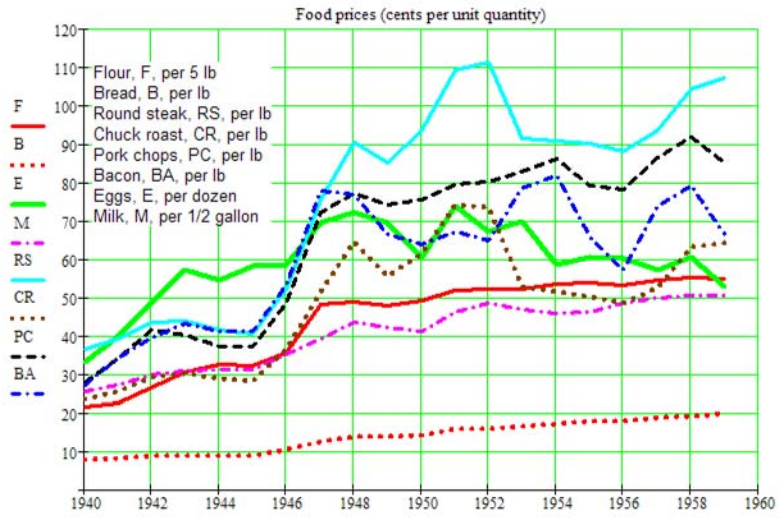



**Figure 11.28:** Prices of selected food items from 1940 to 1959 in current-price cents per unit quantity. Source: Bureau of the Census (1976) Series E 187-195.

numerical shortfall is easily accounted for by numerical roundoff error in the calculations. The model fit for income growth from 1945 to 1955 is

$$\text{AFF}: R = -0.9899875 \quad AFF(y) = \$28.64973 \cdot (1 - 0.0377117)^{y-1945} \text{ billion}$$

in 1967 dollars. Even with numerical roundoff error and uncertainty in the collected statistics taken into account, it is speculative to posit that this represents a natural decline because the correlation coefficient sits right at the convention for empirical threshold for correlation. Natural growth can be posited, but additional supporting evidence must be examined to support the hypothesis. As noted earlier, earnings for wage earners in AFF from 1940 to 1944 *did* exhibit a natural growth characteristic and did so at the extraordinary annual rate of 19.4%. This does seem to corroborate the hypothesis that 1945 to 1955 likely does represent a period of natural income decline – what stock traders call a "market correction" of the exceedingly high 1940-'44 rise in earnings in this industry. The correction in this case could easily be caused by pushback reaction to the costs of food, forest, and fishery products that would accompany such a rise in earnings following the end of wartime rationing.

Figure 11.28 illustrates that precisely such a rapid climb in prices did in fact occur. Consumers do not see an inflation-adjusted price at the counter; they see current prices and react to them directly. Many basic American food staples doubled, or more, in price from 1945 to 1955. The reaction of consumers to this would have been immediate, especially for a generation who had just lived through the Great Depression: they would have substituted lower-priced substitutes and cut back on consumption. I remember eating a diet of mostly bread, cereals, and chuck roasts in the 1950s. I have never really liked chuck roast very much. Pork chops were a real but rare treat.

Mining and construction both exhibited the character of nature growth rate processes from 1960 to 1970. Model fits over this period are

$$\text{Mining}: R = 0.9999877 \quad M(y) = \$6.400252 \cdot (1 + 0.003081)^{y-1960} \text{ billion;}$$
$$\text{Construction}: R = 0.9924684 \quad C(y) = \$23.78056 \cdot (1 + 0.046316)^{y-1960} \text{ billion}$$

both in 1967 dollars. The growth rate in mining was so anemic as to be practically nonexistent.

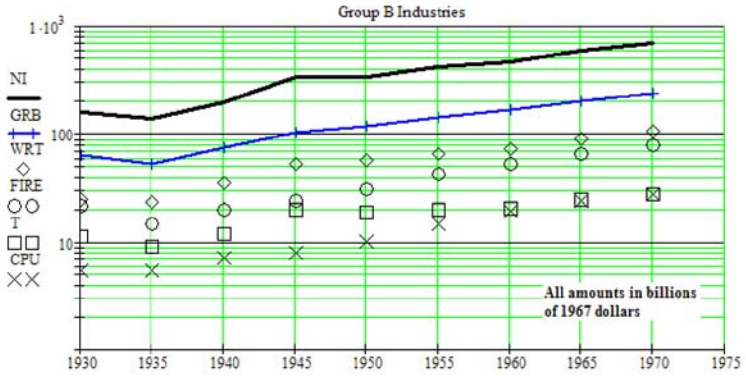



**Figure 11.29:** Group B (distributors) income in billions of 1967 dollars. NI = national income, GRB = sum total of Group B income. For the rest of the key see table 11.3. Source: Bureau of the Census (1976) Series F 231-234.

Manufacturing exhibited a brief, but somewhat glorious, period of natural growth during the prewar industrial buildup and the war years from 1935 to 1945. Growth rate in this period was a extraordinary 11.5%. The model fit for 1935-1945 is

$$\text{Manufacturing}: R = 0.9987626 \quad MNF(y) = \$32.09398 \cdot (1 + 0.114976)^{y-1935} \text{ billion}$$

in 1967 dollars. It was never able to sustain this sort of natural growth for any appreciable interval of time throughout the remainder of $M_4$.

Figure 11.29 presents the income performance of Group B. Three of its four constituent industries exhibit the characteristic of a natural growth process; the fourth comes close but falls just short of achieving it twice in the period covered. Wholesale & retail trade (WRT) exhibits it in adjacent periods from 1935 to 1945 and then from 1950 to 1970. The model fits are

$$\text{WRT}: R = 0.9999995 \quad WRT(y) = \$22.90558 \cdot (1 + 0.085258)^{y-1935} \text{ billion}, \; y \in [1935, 1945];$$
$$\text{WRT}: R = 0.9949716 \quad WRT(y) = \$22.90558 \cdot (1 + 0.031122)^{y-1950} \text{ billion}, \; y \in [1950, 1970].$$

Finance, insurance, and real estate (FIRE) also exhibits the characteristic in two periods, from 1935 to 1950 and from 1955 to 1965 with a just-discernible break between 1965 and 1970. The model fits are

$$\text{FIRE}: R = 0.9960909 \quad FIRE(y) = \$14.96424 \cdot (1 + 0.049310)^{y-1935} \text{ billion}, \; y \in [1935, 1950];$$
$$\text{FIRE}: R = 0.9982396 \quad FIRE(y) = \$42.18588 \cdot (1 + 0.044203)^{y-1955} \text{ billion}, \; y \in [1955, 1965].$$

Communication and public utilities (CPU) exhibits the characteristic in two contiguous intervals, 1945 to 1955 and 1955 to 1965 with discernible breakpoints in 1955 and again in 1965. Its model fits are

$$\text{CPU}: R = 0.9938428 \quad CPU(y) = \$7.640861 \cdot (1 + 0.066146)^{y-1945} \text{ billion}, \; y \in [1945, 1955);$$
$$\text{CPU}: R = 0.9976205 \quad CPU(y) = \$14.94342 \cdot (1 + 0.049530)^{y-1955} \text{ billion}, \; y \in (1955, 1965].$$

Only the transportation industry (T) falls short of exhibiting the characteristic of a natural growth process. For 1950 to 1960 it falls short with $R$ = 0.9866780, and for 1960 to 1970 it again

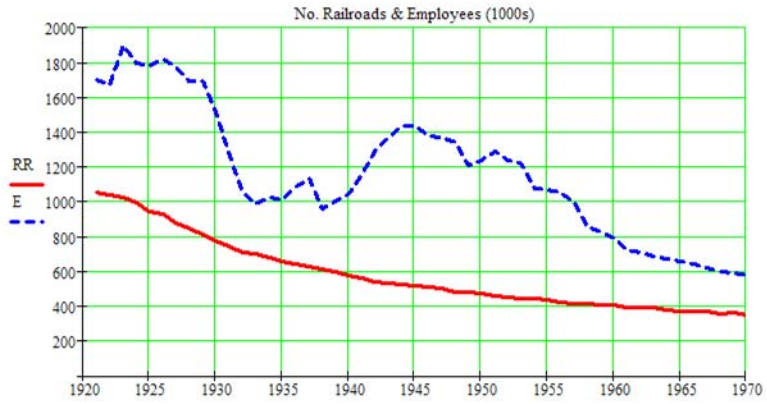



**Figure 11.30:** Number of operating U.S. railroads and railroad employees from 1921 to 1970. RR = number of operating railroads. E = number of railroad employees in thousands. Source: Bureau of the Census (1976) Series Q 284, 398

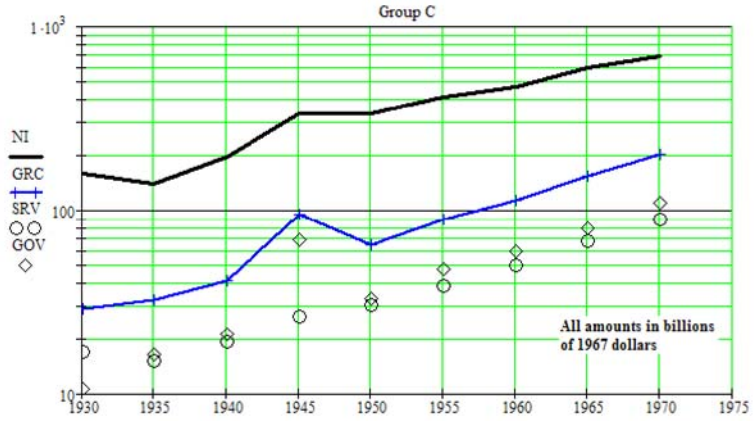



**Figure 11.31:** Group C (service and government) income in billions of 1967 dollars. NI = national income, GRC = sum total of Group C income. For the rest of the key see table 11.3. Source: Bureau of the Census (1976) Series F 235-236.

falls short with $R = 0.9874282$. Two more or less obvious hypotheses compete here to explain the observed performance of the transportation industry. The null hypothesis is that T does not form a mini-Community at all. The alternate hypothesis is that T presents a mini-Community being confronted with a series of Toynbee challenges and not succeeding in meeting these challenges.

Only a more in depth study of the transportation industry can tip the evidence one way or the other in regard to these competing hypotheses. I personally tend to favor, at this time, the alternate hypothesis – that T is a failing mini-Community during $M_4$ – in light of the following additional factors. First, this industry was heavily unionized, although the Bureau of Labor Statistics does an appallingly poor job of reporting union data through the Census Bureau. It seems very unlikely an industry in which unions such as the Teamsters were so prominent during this period would fail to exhibit mini-Community formation. Second, the railroad industry was certainly being confronted with major challenges by technology improvements in motor vehicles, the construction of the nation's interstate highway system, and the growth of the airlines industry. The mismanagement of the railroads by its hired-help managers, who thought they were in the railroad business instead of the transportation business, is also a factor. Figure 11.30 presents the number of operating railroads and the number of railroad employees (in thousands) from 1921 to 1970. The data reveal a sick and dying industry that less than a century earlier had been a high

technology darling of American business. Even so, the question requires more study.

Figure 11.31 presents the two constituents of Group C. Here, both the service industry proper and government clearly exhibit the character of natural growth processes from 1950 through 1970. This evidence favors the hypothesis that each presents a mini-Community. The model fits for this period are

$$\text{Government}: R = 0.9976511 \quad GOV(y) = \$33.64266 \cdot (1 + 0.060267)^{y-1950} \text{ billion};$$
$$\text{Service}: R = 0.9994893 \quad SRV(y) = \$29.80498 \cdot (1 + 0.055663)^{y-1950} \text{ billion}.$$

## § 5. Chapter Summary

This is a lengthy chapter and in any lengthy report that brings out numerous empirical findings it is easy to lose track of them. A recapitulation of those most pertinent to the institution of public instructional education is therefore in order.

The theory of mini-Communities is central to understanding a Society, its institutions, and their proper design and function. Social-chemistry is a theoretical methodology to be employed in developing social-natural sciences of institutions and Societies. Many methods and mathematical tools already exist from work in the physical-natural sciences that can be imported, modified, and put to use for the purposes of social-natural science. The SAMO model is one example of a possible mathematical systems approach to modeling societal dynamics.

The phenomena reviewed in chapter 11 are economic phenomena judged to be pertinent to the identification of economic mini-Communities. The standard for empirical judgment used here is the degree to which economic phenomena appear to follow natural growth or natural decay processes over time. It is hypothesized that real mini-Communities will exhibit this sort of process as each individual member seeks to improve and perfect the power of his person (his own *Personfähigkeit*). Mathematical correlation is used as the standard gauge with a magnitude greater than 0.990 established as the cut point. However, if $R$ is very close to the cut point value, corroborating evidence must always be sought because when $|R| = 0.990$ the level of confidence that a conclusion is a false positive or a false negative is too great to ignore.

Existing data covering $M_1$ and $M_2$ are sparse and limited. Nonetheless, examination of hourly earnings data does support the hypothesis that such economic data can be used to identify features signaling the real *Dasein* of mini-Communities. Economic phenomena are directly linked to the degree of tangible *Personfähigkeit* achieved by individuals and corporate persons. The mental physics of the processes of human judgmentation, practical action selection, and equilibration all compel every human being to practically regard perfection of the tangible power of his own person as a psychologically-necessary goal. In this way economic circumstance is self-made into a direct stimulator of provocations involving the individual's higher tenets of Duties-to-Self in regard to his external situation. Interpersonal interactions are co-determined by the mutual interests and antagonisms of practical tenets held by the different interacting persons or groups of persons. Civil Communities form when these interactions lead to reciprocal tenets of mutual Obligation and concepts of deontological Duty.

Epoch $M_3$ was brought on by *laissez faire* government policies resulting in inadequate over-sight and regulation of U.S. banking and investment enterprises. This permitted the actions taken by a relatively tiny fraction of the U.S. population, taken in pursuit of the satisfaction of their own self-interests, to co-involve the far greater body politic of the citizenry at large in the adverse consequences that eventually came from these actions. The actions these individuals took are easily predictable from an understanding of deontological practical maxims of Duties-to-Self. *Laissez faire* policymaking and lawmaking was an uncivil factor in government that allowed

unwise actions to develop the conditions for and then trigger the economic crash of 1929. Once triggered, positive feedback mechanisms within the Enterprise-protein structure of U.S. Society acted to worsen the severity of the overall economic effects. The policy of *laissez faire* was a dereliction of Congressional and Executive Duty to promote the general welfare of *all* citizens.

$M_4$ was a largely unsettled epoch. It displayed brief interludes of economic equilibrium by exhibiting natural growth processes, but these processes were non-robust and were not sustained. Small business proprietors demonstrated superior and more profitable management skills in the employment of the resources at their disposal than did the hired-help managers of larger corporations.

The data demonstrate that mini-Communities are not permanent. They form and dissolve under conditions of social, technological, and economic change. The absence of evidence of natural growth processes when $|R|$ is very close to the cut point of 0.990 must be regarded as possibly signaling that the displayed economic dynamics might be those of an actual mini-Community facing challenging hindrances to its members' exercise of their civil liberties permitted under the social contract of Society-at-large. This is of vital social importance because in such a situation the formation of Toynbee proletariats is prone to occur with possibility of a resulting aftermath of breakdown in the Society overall. It is a situation that pertains immediately to the justice system of the nation because it directly pertains to governments' general objective to secure the blessings of civil liberty for all citizens.

Mini-Community extinction differs from mini-Community breakdown. In the latter, the social institutions themselves disintegrate. In the former, they are maintained, but for a declining population of mini-Community members – a "vanishing breed." Technology is a significant factor in bringing about mini-Community extinction. It tends to affect the marketability of tangible skills of enterprise that persons rely upon to obtain their income revenue. Major techno-economic changes can produce major changes in demanded skill sets within the Society's overall division of labor.

Within any Society, mini-Community formation and dissolution occurs as a continually on-going process. This has significant and, I think, rather obvious implications for social institutions of all kinds. In $M_4$, much although not all the data signals that a major trend break in U.S. Society occurred in the period from 1965 to 1970. This period corresponds in time to a national phase of violence and turmoil that produced deep divisions among divers groups of Americans. Because this period saw frequent episodes of deadly violence occurring nationwide, it can only be called a period of civil war. This is in contrast to earlier violent episodes characteristic of the early phases of the civil rights movement, when incidents tended to be highly local and regionalized rather than national in breadth. Under the later-phase conditions, the widespread formation of Toynbee proletariats is practically unavoidable.

Mini-Communities do not necessarily form by classes of occupations along industrial lines. Sometimes they do, but there are exceptions. When there is an inconsistency between industry earnings or income growth processes and occupational class earnings growth processes, the possible *Dasein* of an instituted caste system cannot be dismissed. All caste systems are antisocial and violate the terms of the American social contract. They are perpetrations of injustices and, if these are allowed to be perpetuated, will produce Toynbee proletariats and eventually bring about the fall of the Society.

Four general findings can be concluded from the analysis:

1. Empirical evidence suggests people do form large, abstract mini-Communities along the lines of occupational pursuits;
2. Mini-Communities both come into existence and undergo economic extinction as

socio-economic-technological changes occur;

3. Actions taken by one group affect other groups through the mediation of the Enterprise-protein structure of a free enterprise system. The transmitted effects can be either beneficial or disbeneficial.
4. Because of (3), systems for governmental monitoring of mini-Community diversity, conditions, and behaviors must be instituted to be adaptive and flexible if agencies of government at all levels are to be able to provide adequate civil government to the Society and remain responsive to the Sovereign, i.e., the nation's citizens. This is a function instituting non-instructional education necessary for the preservation and Progress of a free Society. The U.S. Census Bureau is one example of such a necessitated educational institute.

The series of income data was usable as a measure of success or failure of Enterprises. The U.S. economy is divided into three major Enterprise groups: producers, distributors, and other service providers (including government). As a group, producers' Enterprises do not form a producer's mini-Community in the United States. This means their enterprise network dynamic is competitive and non-cooperative. The psychological implication here is that corporate decision-makers in the producers' group tend to regard business as a zero-sum game. Consequently, in an uncivic free enterprise environment such attitudes or presumptions naturally lead to a Darwinian circumstance of internecine competition. However, the fact that the other two major groups *did* exhibit natural growth processes, with the implication that they form great mini-Societies of cooperating mini-Communities, shows that the producers' group zero-sum presupposition is false.

Furthermore, false supposition of a zero-sum economy is antithetical to Progress in a Society. Indeed, such a presupposition, which can and does act as a so-called "self-fulfilling prophecy," is antithetical to the wealth of the nation. In $M_4$, Enterprise groups that exhibited mini-Community outperformed the producers' group in both consistency of income growth and rate of income growth.

I would like to report to you that epoch $M_5$ presents a much improved picture over the circumstances seen to be setting in at the end of $M_4$. Unfortunately, the evidence is against any such happy finding, as chapter 12 next demonstrates.

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