We propose that sociological theory should comprise a series of elementary and abstract principles on the operation of distinctive and generic social processes. These processes intersect and interact in varying combinations to create diverse social forms, including stratification. Six elementary principles, stated as simple equations, are developed for the social processes implicated in societal stratification.

1

SOME THEORETICAL PRINCIPLES OF SOCIETAL STRATIFICATION

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In this chapter we present six theoretical principles on societal stratification. Several assumptions have guided us in developing these principles. First, we assume that, in Radcliffe-Brown's (1948) words, "a natural science of society" is possible and that theoretical principles in sociology can and should resemble those in the other natural sciences. Second, we believe that theory in sociology should constitute a storehouse of elementary principles that are drawn on, in varying combinations, to explain some phenomenon of interest. Third, we argue that these principles should be highly abstract and simple, incorporating few concepts and articulating only the most basic relationships among concepts.

Although these assumptions invite controversy, our intent in enumerating them is to place into context the theoretical strategy to be pursued in this chapter. We do not visualize stratification as a unitary phenomenon about which "a" or "the" theory can be developed. For us, *stratification* is a name that sociologists give to the convergence of, and interaction among, several more basic social processes. In this chapter, then, we will attempt to isolate these underlying processes and then articulate an abstract principle for each.

Basic Social Processes and Stratification Systems

In this preliminary effort, we consider three generic processes to be implicated in what sociologists and anthropologists label "social stratification."

Distributive Processes. Valued resources are distributed unequally among members of a social system. At the most abstract level, we conceptualize these distributive processes in terms of the degree of concentration (C) of three basic resources: material wealth (MW), power (PO), and prestige (PR). The issue of concentration concerns the question of what proportion of persons in a social system possesses what proportion of a given resource (Mayhew and Schollaert, 1980). The following definitions will guide our analysis:

C_{MW} = the degree of concentration of material wealth in a system, with wealth defined as those material objects that people in a system value and find gratifying, or the capacity to purchase those objects with money

C_{PO} = the degree of concentration of power in a social system, with power defined as the capacity of a social unit to control the actions of other social units

C_{PR} = the degree of concentration of prestige in a social system, with prestige defined as the honor, respect, and esteem given by one social unit to another

In conceptualizing inequality, then, we are focusing on the issue of concentration. Indicators of the concentration of material wealth, such as income, are often defined as a Gini coefficient stating the

degree of deviation of the actual distribution of income from a hypothetical distribution of perfect equality (Turner and Starnes, 1976:54). Our view is that inequality of power and prestige can also be defined by concentration measures.[1]

"Social Class" Processes. From our perspective, the term *social class* is too inclusive. Social class is the realization of underlying social processes and therefore cannot be viewed as a unitary property of social systems. Although we acknowledge that other processes are no doubt involved, we will focus on only two discrete social processes that sociologists seem to denote most often by such terms as *class, stratum,* and *rank.* These are defined as follows:

DF_{HO} = the degree and extent of differentiation of homogeneous subpopulations in a system, with homogeneity defined as the degree to which subsets of members in a system can be distinguished by common or similar behaviors and attitudes

RA_{HO} = the degree to which homogeneous subsets in a system can be lineally rank-ordered in terms of their imputed worthiness

These two processes might be viewed as "group formation" and "ranking" processes, respectively. When sociologists discuss social class, they appear to stress that people belong to ranked subpopulations, but too frequently they fail to view ranking and subpopulation formation as separate variables. That is, the degree of group formation and the degree of ranking can vary independently. Hence, we must develop separate principles for each process.

Mobility Processes. People in social systems move from position to position and from place to place. In the context of stratification, concern is with movement across ranked positions and/or ranked subpopulations. Hence, our inquiry will be guided by the following definition:

MO = the degree of movement of individuals or collectivities of individuals from one ranked subpopulation to another, with the degree of social mobility defined in terms of (1) the proportion of individuals in a society who are mobile and (2) the

distance across rank-ordered subpopulations that those who are mobile travel

There is little that is original in our "discovery" of these processes; indeed, they often organize discussions in basic texts on stratification. But the full implications of distinctions like the foregoing are not always recognized. For example, if inequality in the distribution of wealth is a distinctive property of stratification (and of social organization in general), it requires a separate principle (in our terms, a principle on C_{MW}). The same is true for the other processes listed above—that is, C_{PO}, C_{PR}, DF_{HO}, RA_{HO}, and MO.

In the sections that follow, our goal will be to develop several elementary equations that explain the dynamics of the processes just listed. In this initial effort, we will confine our analysis to societal stratification, although the processes defined are relevant to other units and levels of analysis. Moreover, as will become evident, we will seek to simplify the equations by modifying somewhat conventional mathematical notation. And we should stress at the outset that our efforts are theoretical. At this stage we are not attempting to operationalize concepts or to test the principles. Such activities are obvious next steps, but they are beyond the space limitations of a single chapter.

Principles of Distributive Processes

As our earlier definitions imply, analysis of distributive processes requires an understanding of those conditions influencing the concentration of three basic resources—material wealth, power, and prestige. For each of these resources, somewhat different conditions affect the degree of concentration, and hence it is necessary to develop three separate theoretical principles for C_{MW}, C_{PO}, and C_{PR}.

Concentration of Material Wealth. In Equation 1 we present our views on those generic forces that are related to C_{MW}.

$$(1) \quad C_{MW} = W_1(P^{\exp}) \times W_2(NH^{-\exp}) \times W_3(NO^{-\exp})$$

where

P = the degree of productivity, or the total volume of products and services generated by the members of a social system, with products defined as material objects created by the conversion of environmental resources and with services defined as activities that facilitate the production and distribution of material objects

NO = the number of organizational units in a social system

NH = the number of hierarchies that link organizational units in a social system, with hierarchies defined as the vertical control of units in terms of power

and where

$$W_1 > W_2 > W_3$$

The notation system in Equation 1 and in subsequent equations requires some explanation. In our equations, we can potentially present six basic types of relations between the variables on the left-hand side of the equation and each of those on the right-hand side: positive linear, negative linear, positive logarithmic (log), negative logarithmic (-log), positive exponential (exp), and negative exponential (-exp). In Equation 1, C_{MW} is viewed as a positive exponential function of productivity (P) and a negative exponential function of the number of social hierarchies (NH) and the number of organizational units in a system (NO). Each of the variables in Equation 1 is weighted (as symbolized by W_1, W_2, W_3) so that the exponential relation between P and C_{MW} is given more weight than the negative exponential relation between C_{MW} and NH, which, in turn, is assigned more weight than the negative exponential relation between C_{MW} and NO. The terms in the equation are multiplicatively related because the effect of each independent variable on C_{MW} depends on the levels of the other independent variables.

Equation 1 borrows ideas from Marx ([1867], 1967), Weber (1968), Lenski (1966), and Turner (1972). Both Marx and Len-

ski have argued that inequality in wealth is a function of productivity and the concentration of power.[2] Under conditions of low levels of productivity, extreme concentration of material wealth would drive the majority of a population below subsistence, whereas under conditions of high productivity, there is much material surplus to extract. This relation between productivity and the concentration of material wealth is exponential because initial increases in P have less effect on C_{MW} than subsequent increases.

Rather than using the concentration of power (C_{PO}) as the second term in Equation 1, we have conceptualized the impact of the distribution of power on C_{MW} in terms of the densities of organizational units (NO) and hierarchies (NH) in societies. This formulation borrows heavily from Lenski's discussions of the origins of the state, Marx's consideration of monopoly power, and Weber's concern with the growth of bureaucratic authority. Hierarchical organization of units in a society involves the use of power by units high in the hierarchy to extract resources from units lower in the hierarchy; in our conceptualization, it is the number of hierarchies that is the critical force. That is, among two societies with comparable productivity and organizational density, the one with more hierarchies will reveal the least concentration of material wealth, for whereas resources will flow to the top of any hierarchy (Michels, 1915), the existence of multiple hierarchies disperses resources more than in systems with one hierarchy. These processes help account for Lenski's (1966) finding that industrial social systems reveal less inequality than agrarian systems, despite their increased productivity. One reason for this decrease, we feel, is the increasing number of social hierarchies in industrial societies, but additionally, much of the increase in equality is the result of the third variable on the right side of Equation 1—the number of organizational units in a system (NO). Weber (1968) recognized clearly that organized subunits in a system require resources to sustain themselves; and the more organizational subunits in a society, whether kin-based, community-based, economic, or political, the more dispersed will be resources. In sum, then, the degree to which wealth is concentrated in social systems is a positive function of productivity and a negative function of the number of social hierarchies and organizational subunits in a system.

Concentration of Power. In Equation 2 we specify what we believe are the most generic conditions influencing the concentration of power (C_{PO}) in societal social systems:

$$(2) \quad C_{PO} = W_1 \log(ET) \times W_2(P^{\exp}) \times W_4(IT^{\exp}) \times W_3(IC^{\exp})$$

where

ET = the degree to which members of a social system perceive threats from sources external to that system
P = productivity (see definition in Equation 1)
IC = the level of internal conflict, or potential for internal conflict, among units in a system
IT = the total volume of internal transactions among members and units of a system

Equation 2 states that the concentration of power (C_{PO}) is logarithmically related to the level of perceived external threat (ET) and exponentially related to the level of productivity (P), the degree of internal conflict or conflict potential (IC), and the volume of internal transactions (IT). These factors stand in a multiplicative relation to one another with regard to their impacts on the concentration of power. That is, the effect of each factor on C_{PO} depends on the levels of the other factors. The weightings (W) argue that external threat is the most important influence on the concentration of power, followed respectively by productivity, internal conflict, and internal transactions.

The processes connecting these variables to C_{PO} and to one another in the ways specified in Equation 2 can be described as follows. As Spencer (1885) and Simmel (1956) recognized, societies engaged in conflict, such as war, become despotically organized in order to mobilize and coordinate resources for the conflict. We have stated this insight more abstractly in that any perceived threat to a society creates pressures for the centralization of authority to mobilize and coordinate resources to deal with the threat. We view this relation between ET and C_{PO} as logarithmic in that initial increases in perceived threat immediately activate and disproportionately affect the level of C_{PO} more than subsequent increases.

Productivity is related to C_{PO} in ways visualized by such

thinkers as Marx ([1867], 1967, [1848], 1971) and Lenski (1966). Increases in *P* create material wealth, which is usurped by some sectors and used to buy power; and once power is initially consolidated, it can then be mobilized to acquire more wealth and employed again to garner even more power. However, this relation between C_{PO} and *P* is exponential, in that productivity must increase to a point where there is a sufficiently large economic and material surplus to usurp and utilize in consolidating political power (see Lenski, 1966, for empirical documentation).

Internal conflict and C_{PO} are also related exponentially, because initial conflicts, or early increases in hostilities and potential conflict, often disperse power or at least signal its lack of concentration. In systems where conflict has occurred or where it is a constant possibility, considerable centralization of power and its mobilization to deal with internal conflicts will be evident. Thus, although it may appear at first glance that conflict signals the dispersion of power (since to engage in conflict requires that each unit in the conflict have some power), our view is that the total level of power is expanded with conflict and that, over time, power becomes consolidated to deal with internal sources of tension.

Internal transactions are related to C_{PO} in a manner first given forceful expression by Spencer (1885) and more recently by organizational theorists (Blau, 1970). As the volume of interaction among units expands, and as their exchanges of resources increase, coordination, regulation, and control become severe problems, requiring the centralization of power to regularize exchanges. This relation between C_{PO} and *IT* is seen as exponential as well, in that initial increases in the volume of transactions do not require political regulation. It is only after a certain volume is reached that the capacities of system subunits to coordinate and control their own activities are exceeded.

As noted earlier, the factors *ET*, *P*, *IT*, and *IC* are seen to have an interactive relation with the degree of concentration of power. That is, the impact of each factor on the concentration of power is seen to depend on the levels of the other factors. The extent to which an increase in external threat will result in increasing concentration of power, for example, is greater in systems with high levels of productivity, internal conflict, and regulatory complexity than in systems that are lower in these factors.

Similarly, the impact of an increase in productivity, transactional complexity, or internal conflict on the degree of concentration of power is dependent on the existing levels of the other variables. Although it is not immediately relevant to the statement of the principle embodied in Equation 2, the levels of external threat, productivity, transactional density, and internal conflict also "interact" in that these forces may be causally related. As with all the principles stated in this chapter, however, specification of the determinants of the factors on the "right-hand side" of equations is beyond the scope of the current work.

Concentration of Prestige. In Equation 3, we specify some of the conditions influencing the concentration of prestige, or C_{PR}, in societal social systems.

$$(3) \quad C_{PR} = W_1\left[-\log\left(\frac{Po}{N}\right)\right] + W_2\left[\left(\frac{SK}{N}\right)^{-\exp}\right] + W_3\left[\left(\frac{FI}{N}\right)^{-\exp}\right] + W_4\left[\left(\frac{Mw}{N}\right)^{-\exp}\right]$$

where

N = the number of people in a social system
Po = the number of people in status positions that are *perceived* by members of a social system to possess high levels of power
SK = the number of people in status positions that are *perceived* by members of a social system to possess high levels of skill
FI = the number of people in status positions that are *perceived* by members of a social system to possess a high degree of functional importance
Mw = the number of people in status positions that are *perceived* by members of a social system to bring a high level of material wealth

and where

$$W_1 > W_2 > W_3 > W_4$$

Equation 3 states that the degree of concentration of prestige

(C_{PR}) is a negative logarithmic function of the number of positions, as a proportion of all persons (N), that are perceived to possess power (Po), or (Po/N), and a negative exponential function of the number of positions, as a proportion of all persons (N), that are perceived to possess skill (SK), functional importance (FI), and material wealth (Mw), or (SK/N), (FI/N), and (Mw/N), respectively. These variables are seen as additively related, with greater weight given to (Po/N), followed in order by (SK/N), (FI/N), and (Mw/N).

In this proposition, we have borrowed from the Davis-Moore (1945) hypotheses[4] and Bernard Barber's (1978) more recent theory of occupational prestige. As indicated in the definitions presented earlier, prestige involves bestowing honor and esteem; and when we analyze its concentration, we are addressing the question: What proportion of all people in a society is bestowed what level of honor and esteem? Equation 3 states that the concentration of prestige is an additive function of the number of people in a society (N) and the number of positions *perceived* by its members to carry at least some degree of power (Po), skill (SK), functional importance (FI), or material wealth (Mw). The more of these attributes people bestow on a position, the greater will be the honor, esteem, or prestige given to that position. The perceptions do not have to be accurate; people only have to *believe* that others have power, skill, functional importance, or wealth for them to be given prestige. As is evident, however, the number of people in a society is a critical variable in assessing the concentration of prestige. Our concern is not with the level of prestige of any one position but with the *proportion* of all positions in a society receiving honor. The greater the number of positions receiving prestige in relation to the total number of positions, and the greater the number of people in these prestigious positions, then the less concentrated is prestige in a society. And conversely, the fewer the prestigious positions, and the fewer the people in those positions, then the more concentrated is the prestige.

We should emphasize that prestige is a somewhat different resource from either material wealth or power, primarily because it is a perceptual and behavioral variable. It is *bestowed* when people *perceive* that a position has power, functional importance,

skill, or wealth. We are assuming in this statement that people naturally assess positions in terms of these attributes and are willing to give varying degrees of honor in accordance with how much of any one attribute is perceived to exist and which combination of attributes a position is perceived to possess. That is, people want to know which positions are powerful, which ones involve skill, which ones are important for the society, and which ones carry wealth. We are also assuming in Equation 3 that people perceive power as the most deserving of honor, followed, respectively, by perceived skill, functional importance, and wealth. Again, these perceptions do not have to be accurate; people only have to believe that a position carries one of these attributes.

Principles on "Social Class" Processes

As noted earlier, one of sociologists' and anthropologists' most ambiguous concepts is denoted by the label *social class* or, alternatively, *rank* and *stratum*. What is typically termed social class is, at the very least, the intersection of two distinct processes: (1) the process of differentiation (DF_{HO}) of relatively homogeneous subpopulations in societies and (2) the process of ranking (RA_{HO}) of these homogeneous subpopulations.

Differentiation of Homogeneous Subpopulations. In Equation 4 we present our ideas on those properties that affect the degree of differentiation among, and homogeneity in, a society's subpopulations (DF_{HO}).

$$(4)\quad DF_{HO} = W_1 \log(N) \times W_4 (DF_p{}^{\exp}) \times W_5 \log(DF_{T,S}) \times W_2 (I^{\exp}) \times W_3 \log(D)$$

where

N = the total number of people in a social system
I = the degree of inequality in the distribution of rewards, or $C_{MW} + C_{PO} + C_{PR}$
D = the rate of discriminatory acts by members of the majority against members of minority subpopulations in a social system
DF_p = the degree of differentiation of productive positions in a social system

$DF_{T,S}$ = the degree of differentiation of productive positions in time and geographical space

and where

$$W_1 = W_2 > W_3 > W_4 > W_5$$

Equation 4 suggests that the degree of differentiation among, and extent of homogeneity within, subpopulations is a function of size (N), functional, spatial, and vertical differentiation (DF_p, $DF_{T,S}$, I), and discriminatory behavior (D). These factors are seen as interactive in their impact on DF_{HO}. That is, the impact of each factor on the degree of differentiation of homogeneous subpopulations depends on levels of the other factors. Equation 4 also suggests that the effects of each factor on DF_{HO} are nonlinear and that size and vertical differentiation have larger effects than do discrimination (D), functional differentiation (DF_p), and spatial differentiation ($DF_{T,S}$).

As Spencer and Durkheim[5] argued a century ago, there is a basic relation between social differentiation and population size. Part of this relation is purely mathematical in that a small population cannot be divided into as many subunits as a large one. But there are also substantive lines of argument: (1) differentiation of productive and political activities is necessary to sustain and control larger populations; (2) differentiation of larger populations will result from the increasing difficulty of sustaining high rates of face-to-face interaction as the number of interacting parties increases; (3) differentiation of larger populations will ensue from the increasing difficulty of maintaining physical proximity of individuals as their numbers increase. Thus, certainly one of the driving forces behind differentiation is population size. Yet, although population size may increase the degree of social differentiation, it does not account for the degree of homogeneity of differentiated social units.

Our concern is not just with differentiation (DF) but also with those forces related to the creation of homogeneity among differentiated subpopulations (HO). This emphasis requires isolating those forces that are related to increasing not just differentiation itself but also homogeneity of differentiated subpopulations,

or DF_{HO}. Inequality (I) is certainly one such force, since when people possess varying levels of resources, their perceptions and actions will also vary, for the level and configuration of one's resources enable one to do some things and not others; and we assume that people with similar levels of resources are likely to see and act in convergent ways. A high degree of inequality in the distribution of resources produces differences in people's shares of resources; and those with similar shares are, in general, likely to be similar in their attitudes and modal behaviors.

Another condition fostering homogeneity in subpopulations is discrimination, for when members of a society are consistently subject to discrimination (D), they are likely to be excluded from certain positions and forced into a relatively narrow range of productive roles, thereby differentiating them from others while forcing a convergence of attitudes and behaviors. Moreover, victims of discrimination are likely to band together as a way of insulating themselves from the abuses of discrimination, with the result that as their rates of interaction increase, they become more alike in outlook and behavior (which, of course, makes them easier targets of discrimination).

Differentiation of productive positions (DF_p) is another force creating homogeneity. Those in similar roles are likely to develop common outlooks, because (1) their experiences are similar, (2) their rates of interaction are high, and (3) their shares of resources converge. Moreover, if these roles are separated in time and space ($DF_{T,S}$), there are further pressures for the convergence of attitudes and behaviors; for when people are separated in time and region, especially when performing their major income-producing roles, they are likely to develop a common perspective and to engage in modal behaviors that distinguish them from others.

The weightings of the variables in Equation 4 follow from our comments above. Population size (N) is probably the most important initial force in increasing DF_{HO}, because in a small population, differentiation of a society is unlikely. Only in small populations, however, are the limiting effects of size on differentiation fully realized, as is indicated by the logarithmic form of the relation shown in Equation 4. The impact of distributional inequality (I) acts in the opposite direction, with "increasing marginal returns" to differentiation as inequalities increase. Discrimi-

nation (D) is the next most critical force, since it is a major factor increasing rates of interaction within groups. The logarithmic form of the relation between D and DF_{HO} suggests that relatively low levels of discrimination are sufficient to induce group interaction effects and that further increases in discrimination result in smaller increases in interaction. Differentiation of productive activities (DF_p) and separation of subpopulations in time and space ($DF_{T,S}$) are also critical forces in generating homogeneity, though less so than discrimination. The relation between DF_p and DF_{HO} is exponential in that early differentiation of productive roles leads to less differentiation of whole subpopulations than do subsequent increases in differentiation. The relation of $DF_{T,S}$ to DF_{HO} is logarithmic, since initial increases in the separation in time and space of productive workers have more influence on the homogeneity of differentiated subpopulations than do further increments of $DF_{T,S}$.

In Equation 4, size, discrimination, and the various forms of differentiation (DF_p, $DF_{T,S}$, I) are shown as interdependent in their impacts on DF_{HO}. This multiplicative form is a way of specifying a series of assertions that we feel reflect many of the major ideas about the formation of subpopulations that exist in the sociological literature. The multiplicative combination of N, I, DF_p, $DF_{T,S}$, and D asserts, for example, that the impacts of differentiation (DF_p, $DF_{T,S}$, I) on the formation of homogeneous subpopulations are greater in large populations than in small. It is also likely, though beyond the scope of this chapter, that size, differentiation, and discrimination effects on the formation of homogeneous subpopulations are accelerated by causal relations among these factors.

Ranking of Differentiated and Homogeneous Subpopulations. In Equation 5 we present our ideas on the conditions affecting the degree of rank ordering among subpopulations (RA_{HO}):

$$(5) \quad RA_{HO} = W_1 \log(CN_{VS}) \times W_2 (DF_{HO}{}^{\exp})$$

where

CN_{VS} = the degree of consensus over value standards among members of social systems

DF_{HO} = the extent of differentiation of, and the degree of homogeneity in, subpopulations in a social system (see Equation 4)

and where

$$W_1 > W_2$$

Equation 5 states that the degree of linear rank ordering among homogeneous subpopulations (RA_{HO}) is a logarithmic function of the degree of consensus over value standards (CN_{VS}) and an exponential function of the degree of differentiation of homogeneous subpopulations (DF_{HO}). Consensus over value standards is weighted more heavily than subpopulation formation. And CN_{VS} and DF_{HO} are seen as multiplicatively related in that increases in the value of one increase the impact of the other on ranking.

Equation 5 borrows from Parsons's (1953) "analytical model" of stratification, which we view as a theory of ranking more than as a model of stratification.[6] To assess the worthiness of an object, it is necessary to have standards; and at the societal level of organization,[7] we argue, the degree of consensus over value standards is the critical force. In systems with high degrees of consensus, the criteria for ranking are clear, and it is relatively easy to assign a position in that system a rank in terms of its worth as measured against value standards. We have speculated that this relation between ranking (RA) and value consensus (CN_{VS}) is logarithmic because initial increases in value consensus set into motion efforts to apply those agreed-on standards to virtually any differences among the members of a society. We are assuming, of course, that people naturally tend to evaluate and rank one another —an assumption that we feel is reasonable.

In the context of social stratification, our concern is with ranking of homogeneous subpopulations (RA_{HO}), and if a system is to reveal ranked subpopulations, there must be distinct differences among some of its subpopulations. Otherwise, ranking under conditions of high CN_{VS} will be in terms of the attributes of individuals. For us, the degree of differentiation of homogeneous subpopulations (DF_{HO}) is the critical consideration in creating ranked "social classes," because homogeneity of behaviors and

attitudes within different subpopulations gives members of a society a target or object for applying their value standards. But without fairly high degrees of DF_{HO}, rankings will not be clearly linear, since distinctions among subpopulations will be somewhat ambiguous. It is for this reason that the relation between RA_{HO} and DF_{HO} is exponential; that is, initial increases in DF_{HO} are much less critical than further increases, since it is only when DF_{HO} is high that RA_{HO} can also be high.

In Equation 5 CN_{VS} is given more weight than DF_{HO}, because considerable ranking occurs even in populations with quite low levels of differentiation. Yet DF_{HO} can, even at low levels of value consensus, lead to at least some efforts at ranking, we believe, because people in different subgroupings will seek to assess their relative standing (indeed, individuals are constantly engaged in "social comparison" processes). In fact, as people seek to assess their relative standing, they often create value standards to justify their assessments.

In Equation 5 value consensus and differentiation of homogeneous subpopulations are shown as multiplicatively related to RA_{HO}. This multiplicative form suggests that the impact of DF_{HO} on ranking is greater at high levels of value consensus and, conversely, that the impact of value consensus on ranking is greatest in highly differentiated societies. In addition, though beyond the scope of this exercise, the process of ranking in societies is further reinforced by relations between CN_{VS} and DF_{HO} such that increases in the two tend to be associated.

To the degree that stratification involves consideration of "classes" of individuals, then theory must separate those processes that create subpopulations and those that lead to ranking of these subpopulations. We are not arguing that Equations 4 and 5 exhaust the conceptual possibilities for isolating the constituent processes of social class, but we are asserting that it is necessary to view class as the outcome of a series of discrete processes that require separate theoretical principles. Two of these processes are DF_{HO} and RA_{HO}.

Mobility Processes

In Equation 6 we present our ideas on the process of vertical mobility (MO) as defined earlier:

$$(6)\quad MO = [W_1(DF_{HO}{}^{-\exp}) \times W_2(RA_{HO}{}^{-\exp})] + [W_3(NP^{\exp}) \times W_4(CP^{\exp})] + [W_5(C_{OR}{}^{-\exp}) \times W_6(C_{IR}{}^{-\exp})]$$

where

DF_{HO} = the extent and degree of differentiation of homogeneous subpopulations in a social system (see Equation 4)
RA_{HO} = the degree of linear rank ordering of subpopulations in a social system (see Equation 5)
NP = the absolute number of productive positions in a social system
CP = the rate of change in the types of productive positions in a social system
C_{OR} = the degree of concentration of organizational resources in a social system
C_{IR} = the degree of concentration of individual resources in a social system

and where

$$W_1 = W_2 = W_3 = W_4 > W_5 > W_6$$

In Equation 6 the rate of mobility is seen as a function of three basic terms. The first, RA_{HO} and DF_{HO}, may be thought of as the height of the barriers to mobility, or distances among the classes. The negative exponential form attached to these terms suggests that increases in interclass distances at low levels do little to dampen interclass mobility, while similar incremental changes in interclass distances at higher levels have much greater mobility-dampening consequences.

The second major element of Equation 6 refers to "structural" mobility—that is, moves facilitated by either the complexity of the positional structure (NP) or changes in structure (CP). As the number of positions increases, the number of possible moves between positions is seen as increasing exponentially. This is mathematically obvious and requires no further comment. Similarly, changes in the number of positions (CP) create "vacancy chains"

such that the total number of possible moves increases exponentially for each new position created. *NP* and *CP* are seen as related to total mobility in a multiplicative way. An increase of one position in a quite simple structure (low levels of *NP*) is seen as setting off far fewer moves than a one-position increase in a more complex structure, because far more moves will be required to readjust the more complex structure to the changes induced by the addition of a new position.

The third element of the mobility equation (C_{OR} and C_{IR}) suggests that, controlling for structural mobility and barriers to interclass mobility, concentration of organizational and individual resources acts to reduce aggregate mobility. This part of the equation represents the "human capital" or "status attainment" approach to circulation mobility. It suggests that, to the degree that individual resources or access to organizational resources is unequally distributed in a population, aggregate rates of mobility are reduced. Such reductions of mobility rates due to unequal distribution of resources are not linear in their effect, in that increases in C_{OR} and C_{IR} at low levels are argued to have little impact on mobility, while marginal increases in C_{OR} or C_{IR} at high levels act to restrict mobility chances substantially.

The rationale for the relation specified in Equation 6 can be expressed in terms of the processes that connect the variables to one another. Rates of interaction within a homogeneous subpopulation are greater than those outside the subpopulation, creating pressures for similarity in behaviors and attitudes. Such similarities present a barrier to those who would enter this subpopulation, since there is likely to be dissimilarity between the attitudes and behavioral patterns of subpopulation members and those who would seek to enter a population. Unless anticipatory socialization occurs, or unless individuals can acquire the necessary behavioral and attitudinal repertoire quickly on entering a new subpopulation, entry will prove difficult. Ranking of subpopulations accelerates these processes by giving members of a subpopulation something to lose if those below them can penetrate their group, for the more persons who can occupy a given rank, the less will be its worth. Of course, high degrees of ranking of groups provide incentives for upwardly mobile individuals or groups of individuals, but other things being equal, these pressures are more than compen-

sated for by people's desire to preserve their position and exclude those who would dilute its worth. Thus, as homogeneity and ranking of subpopulations increase, processes that inhibit mobility are increasingly operative; and hence DF_{HO} and RA_{HO} not only are multiplicatively related to each other but are related in a negative exponential curve to MO.

The number of productive positions in a society is, we feel, an obvious and very important force. If positions are few, opportunities for movement are limited. But as the number of positions increases, opportunities for people to move to new positions increase, since someone must fill the expanding number of productive roles. When such increases are associated with changes in types of productive positions, then there are even more new opportunities for individuals or groups of individuals.

Whether individuals (or collectivities) can take advantage of opportunities created by such changes is influenced by their organizational and individual resources. Access to resources also influences people's capacity to maintain their rank in the face of changes in the number and nature of positions. If organizational resources are highly concentrated, then those in higher positions can maintain their relative station in either static or changing systems. But if resources are widely dispersed, then pressures for change in people's positions can be generated. Moreover, once changes occur as a result of these pressures or for other reasons, people have the organizational resources to take advantage of the opportunities created by such changes. Dispersion of individual resources accelerates these processes by allowing more people to use their skills to create effective organizations that generate pressures for new opportunities and by increasing the number of persons who can take advantage of whatever opportunities become available.

Conclusion

In this chapter we have argued that theory in sociology should consist of a series of simple and abstract principles about generic social processes. Theory about composite phenomena, such as stratification, thus consists of an ad hoc juxtaposition of elementary principles. We have sought to illustrate the utility of

this no doubt controversial strategy by developing six abstract and simple equations about the generic properties of the social universe that, when found operating together, create a social form usually termed *stratification.*

We do not assert categorically that these six are the only processes involved; there may be more. Our view, however, is that the processes delineated in Equations 1 through 6 are among the most critical; for, whatever else may be involved, stratification is a social form created by the intersection of those processes involved (1) in concentrating material wealth, power, and prestige, (2) in creating subpopulations that become rank-ordered, and (3) in accelerating or lessening the movement of people and groups as they move from one ranked population to another. A "natural science of society" seeks to explain the operation of these processes; and even though Equations 1 through 6 may require refinement or be subject to empirical refutation, they represent a sincere effort to develop scientific theory in the social sciences.

Notes

1. A similar approach to the concept "centralization" as the degree of concentration in the distribution of formal authority across actors in a system is elaborated in Hanneman and Hollingsworth (1978).

2. Marx's basic ideas can be represented as follows: $C_{MW} = W_1(P^{\exp}) \times W_2 \log(C_{CP})$, where C_{CP} is defined as the concentration of control in the means of production and where $W_1 > W_2$. Lenski's formulation can be expressed as follows: $C_{MW} = W_1(P^{\exp}) \times W_2(ES^{\exp}) \times W_3(C_{PO}{}^{\exp})$, where ES is defined as the level of economic surplus and where $W_1 > W_2 > W_3$.

3. This formulation borrows much from Herbert Spencer's (1885) early analysis. Spencer's formulation can be expressed as follows: $C_{PO} = W_1 \log(ET) + W_2(IC^{\exp}) + [W_3(IT^{\exp}) \times W_4(P^{\exp})]$, where $W_1 > W_2 > W_3 > W_4$.

4. The Davis-Moore hypothesis can be expressed as follows: $C_{PR} = W_1\text{-}\log(\frac{FI}{N}) + W_2\text{-}\log(\frac{AP}{N})$, where AP is defined as the number of personnel available to fill positions defined as functionally important and where $W_1 > W_2$.

5. Spencer's (1885) formulation can be expressed as $DF =$

N^{exp}, and Durkheim's ([1893], 1947) can be expressed as $DF = (N^{exp}) + \frac{EC}{N}$, where EC is defined as the extent of geographical space.

6. Parsons's (1953) basic proposition can be summarized as follows: $I = \log(CN_{VS}) + DF_A{}^{exp}$, where DF_A is defined as the differentiation of actors in terms of "qualities," "performances," and "possessions."

7. More abstractly, $RA = (CN_S) \times (DF_A)$, where RA is defined as ranking, CN_S as consensus over standards of evaluation, and DF_A as the differentiation of actors.

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