

THE POLITICS OF NUMBERS

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THE SOCIOLOGY OF OFFICIAL STATISTICS

PAUL STARR

SOCIAL scientists routinely use statistics from official sources as a *means* of analysis, but less frequently do they take the statistics or their sources as an *object* of analysis. If they do, they generally are interested in knowing whether—or showing how—social or political processes have distorted the results and, therefore, why they may be safely ignored or, if possible, what may be done to adjust the data or to improve official statistical practice. Not surprisingly, social scientists in the academy, business, and government approach statistics primarily with their own practical interests in mind—methodology, commerce, and policy.

Yet statistical systems are worth understanding as social phenomena in their own right. Although the sociology of statistics is not an established field of inquiry, much has been written in scattered places about statistical institutions, statistical policy and politics, the social and cultural history of statistics, the uses of statistics in organizations, and other related topics. From these diverse sources emerge general sociological questions about statistics. In this introductory essay I want to set out some of those questions, the approaches taken to them, and the

arguments that seem to me most persuasive and useful in understanding statistics as a social phenomenon.¹

The concept of "statistical system" lies at the center of this inquiry. By a statistical system I mean a system for the production, distribution, and use of numerical information. A statistical system may be said to have two kinds of structure—social and cognitive. Its social organization consists of the social and economic relations of individual respondents, state agencies, private firms, professions, international organizations, and others involved in producing flows of data from original sources to points of analysis, distribution, and use. Cognitive organization refers to the structuring of the information itself, including the boundaries of inquiry, presuppositions about social reality, systems of classification, methods of measurement, and official rules for interpreting and presenting data.

About any information system—whether for record-keeping, surveillance, news, or statistics—it is possible to raise several kinds of sociological questions, depending on whether the object is to explain (or derive consequences from) the origin or pattern of development of the system, its social or cognitive structure, its uses and effects, or its direction of change.² On this basis, it seems convenient to divide the sociology of official statistics into five overlapping sets of questions:

¹The reader should be alerted to three restrictions in the scope of this analysis. First, it is primarily concerned with descriptive statistics that measure social phenomena rather than with statistical data or techniques that measure the effects of different treatments or agents. In the latter category belong evaluation research and controlled social experimentation. The politics of program evaluation, risk assessment, and cost-benefit analysis do not receive sustained attention here. Second, I do not deal with the development of statistical methods. Although the term "statistics" refers both to numerical information and to a field of knowledge (the subject of statistics as a discipline), this analysis concerns statistics only in the first sense. [For historical and sociological work on the development of statistical methods, see Donald A. MacKenzie, *Statistics in Britain, 1865–1930: The Social Construction of Scientific Knowledge* (Edinburgh: Edinburgh University Press, 1981); Paul F. Lazarsfeld, "Notes on the History of Quantification in Sociology—Trends, Sources and Problems," in Harry Woolf, ed., *Quantification: A History of the Meaning of Measurement in the Natural and Social Sciences* (Indianapolis: Bobbs-Merrill, 1961), pp. 147–203; and Lorraine Daston, Michael Heidelberger, and Lorenz Krüger, eds., *The Probabilistic Revolution, 1800–1930* (Boston: Bradford Books, 1987).] Third, this analysis deals with official statistics, by which I mean statistics that governments produce, finance, or routinely incorporate into their decisions. Although the term "official" is sometimes used to describe any institutionally certified form (professional sports have their "official statistics"), the state is the main pathway to the distinctive cultural authority that official facts characteristically assume. Part of my interest in this topic derives from my earlier work on cultural authority. See *The Social Transformation of American Medicine* (New York: Basic Books, 1982), esp. chap. 1.

²In developing these categories, I benefit from James B. Rule's work on surveillance systems. See his *Private Lives and Public Surveillance: Social Control in the Computer Age* (New York: Schocken, 1974), esp. chap. 1. I owe a more general debt here to a classic essay that helped to organize the sociology of knowledge: Robert K. Merton, "Paradigm for the Sociology of Knowledge" [1945], reprinted in Merton, *The Sociology of Science: Theoretical and Empirical Investigations* (Chicago: University of Chicago Press, 1973), pp. 7–40.

1. *System origins and development*: What causes statistical systems to be established? Why do governments or other actors make a decision to count or to allow themselves to be counted? And what processes govern the systems' general historical evolution?
2. *Social organization of statistical systems*: What are the sources and consequences of different designs or patterns in the social organization of statistical systems?
3. *Cognitive organization of statistical systems*: What are the sources and consequences of elements in the informational structure?
4. *System uses and effects*: What effects do the production and distribution of statistical information have on politics and society? Do statistical systems shape understanding of social and economic reality so that effects are due, not to the phenomena measured, but to the system measuring it?
5. *Contemporary system change*: What processes, such as political changes or technological innovations, are now shaping the current and future development of statistical systems? Like the first group, these questions are historical and developmental, but they concern the future rather than the past.

The last of these sets of questions is partially dealt with in the final two chapters in this volume. Here I take up the first four problem areas and try to outline the sorts of questions raised and approaches taken for each of them.

I. Statistical Systems in the Making: Origins and Development

Social and economic statistics, Otis Dudley Duncan has recently observed, share common features with other forms of measurement.³ Like standard physical weights and measures, as well as measures of time and even common units of currency, they serve an interest in social coordination and control. In their origins and operation, they also have a specific relation to the state. Other institutions or groups often do not command—and have no reason to invest—the financial resources, organization, and authority required to carry out censuses and large-scale surveys. However, precisely because of the state's power, its inquiries are often especially feared and resisted as invasions of privacy and because of their possible use for assessing taxes or catching suspected criminals and subversives. To the use of statistics for domes-

³Otis Dudley Duncan, *Notes on Social Measurement: Historical and Critical* (New York: Russell Sage Foundation, 1984), pp. 12–38.

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tic intelligence have been added other complex political functions in the allocation of money and power, the setting of norms, the making of policy, and the evaluation of government performance. All these functions have increased the stakes in official statistics and underlined the importance of understanding their origin and development.

Explaining why governments produce social and economic statistics poses two separate tasks. The first is to explain the foundations of measurement: why governments establish the framework for a statistical system and what preconditions allow them to do so. The second is to explain specific decisions to introduce (or eliminate) a statistical series or undertake a particular survey once an intellectual and bureaucratic framework already exists. The first is a problem in institutional innovation; the second, in policy initiation (or termination). The inauguration of a population census or the advent of labor statistics is an example of the first; the introduction of a statistical series on job vacancies is an instance of the second. I shall concentrate here on the foundational problem.

Social Foundations of Official Statistics

One difficulty in explaining the foundations of official statistics is that they have a somewhat confusing line of historical descent. Census-taking originated as a means, not of gathering quantitative data, but of surveillance, conscription, and tax assessment. Neither did the term statistics originally have its present meaning. When first used in German and English, "statistics" meant facts about states and did not specifically refer to numerical data, much less to an abstract set of analytical principles. But although the earliest censuses and statistical studies do not correspond to modern social forms, the connections as well as the discontinuities between them are helpful in understanding the roots of modern statistical systems.

Censuses, Ancient and Modern

Censuses of population can be traced to ancient societies, but from ancient Greece and Rome to early modern societies a census was a registration of people and property. The term census comes from Latin and in Rome referred to "a register of adult male citizens and their property for purposes of taxation, the distribution of military obligations and the determination of political status."⁴ The Roman censor was also charged with the control of manners; hence the etymological associa-

⁴Walter F. Willcox, "Census," *Encyclopaedia of the Social Sciences* (New York: Macmillan, 1930), vol. 2, pp. 295-300.

tion with our terms censor and censorship. As late as the sixteenth century, Jean Bodin's classic work on statecraft, *The Six Bookes of a Commonweale*, described a census as "nothing else but a valuation of every mans goods," useful not only for levying taxes but also for determining the number and age of men available for war and public works, the needs of cities in the event of a siege, the resolution of civil disputes, and "the discovery of every mans estate and faculty, and whereby he gets his living, thereby to expell all drones out of a commonweale . . . and to banish vagabonds, idle persons, theeves, cooseners, & ruffians, which live and converse among good men, as wolues do among the sheepe. . . ." ⁵ A census at this stage was unambiguously an instrument of state power and social control.

A modern population census differs in several crucial ways. ⁶ *First*, a modern census is an enumeration of an entire population in a nation or one of its geographical subdivisions. Premodern censuses, according to Willcox, were often limited to males, particular age groups and classes, or hearths and households, and thus were less inclusive. ⁷ *Second*, a modern census records and counts individuals and provides data at the individual level. As late as the early nineteenth century, the household typically continued to be the unit of enumeration; minimal information, if any, was recorded about individuals other than the head. *Third*, a modern census is an enumeration at a fixed time, whereas the premodern form was often a continuous register. *Fourth*, statistical data from modern censuses are typically expected to be published; premodern censuses were generally state secrets. *Fifth*, and perhaps most significant, nations today generally distinguish statistical agencies from those charged with tax assessment and law enforcement; no such distinction was made in the premodern form. The modern census has as its primary and manifest function the production of quantitative information, whereas the premodern form was used explicitly for keeping people under surveillance and control.

The primacy of statistical functions and their bureaucratic segregation from police and tax collection influence, or are meant to influence, the social relation between census-takers and respondents. Although some respondents are suspicious of census-takers, many share the understanding that the purpose of an official census is to generate information about aggregates of people, not about individuals. Reports in the

⁵Jean Bodin, *The Six Bookes of a Commonweale* [1576], ed. Kenneth Douglas McRae (Cambridge, Mass.: Harvard University Press, 1962), pp. 637, 641.

⁶The characteristics of modern censuses identified here come from a United Nations list of "essential features" of a population census. This is a statement of normative expectations; not every criterion is realized all the time. See Conrad Taeuber, "Census," *International Encyclopedia of the Social Sciences* (New York: Macmillan, 1968-79), vol. 2, pp. 361-62.

⁷Willcox, "Census," p. 295.

mass media impart a general familiarity with statistical inquiry. In liberal democracies, moreover, citizens are generally guaranteed that their census returns will be held confidential.

In its treatment of information about individuals and populations, therefore, the modern census—at least in the liberal democracies—inverts the premodern pattern. In the premodern census, the state obtained information about persons and kept secret information about its population. The modern census is ideally expected to assure anonymity to persons and publicity to facts about population. Behind this inversion of secrecy lies a more profound change. The modern census presumes a cooperative relation between a state and its citizens rather than a coercive relation between a state and its subjects. The emergence of modern censuses, therefore, involves not only the expansion of statistical functions but also the separation of census-taking from surveillance and a new social understanding of the purpose of censuses and, more generally, of the relation between states and peoples.

The cluster of characteristics that I have identified with modern censuses did not come into existence simultaneously or unambiguously. A municipal census of Nuremberg in 1449 may have been the first to include the entire population, but its results were secret. Claims of the first modern census have been variously made for Canada, which as a French colony had an enumeration in 1665; for Sweden, where a census based on parish registers began to be taken in 1749; and for the United States, which in 1790 became the first nation to inaugurate a periodic census, publish the results, and use them in the organization of government. However, even in the United States it was not until the mid-nineteenth century that confidentiality was assured to respondents and the census began to record every individual by name.⁸

The legacy of the premodern census represented a major barrier to the development of the modern form. In eighteenth-century Europe, many statesmen who were convinced of the value of censuses were also convinced that they were administratively unfeasible because of popular or provincial opposition. In France during the mid-1700s, several inquiries into population and economic output were blocked by refusals of cooperation not only from ordinary people but also from local authorities who feared new tax levies. The *parlement* of Rouen threatened to fine anyone complying with one such survey.⁹ A proposal for a census

⁸Willcox, "Census"; August Meitzen, *History, Theory, and Technique of Statistics*, vol. 1., supp. to *Annals of the American Academy of Political and Social Science*, March 1891.

⁹David S. Landes, "Statistics as a Source for the History of Economic Development in Western Europe: The Protostatistical Era," in Val R. Lorwin and Jacob M. Price, eds., *The Dimensions of the Past: Materials, Problems, and Opportunities for Quantitative Work in History* (New Haven, Conn.: Yale University Press, 1972), p. 67.

in Great Britain in 1753 met defeat in Parliament at the hands of opponents who saw it as instrument of central domination.¹⁰

The use of censuses and surveys for surveillance continues to be a political concern. Studies of both the Chinese and the Soviet statistical systems emphasize the historical links between statistics and state intelligence.¹¹ Such systems have guaranteed neither confidentiality to facts about persons nor publicity to facts about populations. Fears that censuses may threaten individual rights have also arisen in the West and jeopardized the conduct of statistical inquiries. Since the early 1970s, many Western countries have introduced new measures to protect individual privacy, particularly against the risks posed by computerization.

The separation of censuses from surveillance, therefore, is not simply a theoretical dichotomy or historical accomplishment. It is a distinction that at least democratic governments continually must reassert as an institutional reality if they are to ensure the public trust necessary to carry out reliable statistical inquiries.

The Emergence of the Modern Concept of Statistics

As the modern census differs drastically from its antecedents, so, too, does the modern conception of statistics. The term itself indicates its historical association with knowledge of the state. In seventeenth- and eighteenth-century Germany, a series of university professors, beginning with Hermann Conring (1606–81), developed the field of *Staatenkunde*, the systematic study of states, an early form of what we would today call comparative politics. In their use, statistics were facts about a state, regardless of whether they were numerical. Among eighteenth-century practitioners in this field were exponents of *Tabel-lenstatistik*, who attempted to arrange the facts about states into rows and columns. Though not necessarily consisting of numbers, tables encouraged their use. Nonetheless, the German tradition of "university statistics" remained predominantly nonquantitative.¹²

In seventeenth-century England, William Petty (1623–76) and others pioneered a quantitative approach to problems of public policy.

¹⁰Peter Buck, "People Who Counted: Political Arithmetic in the Eighteenth Century," *Isis* 73 (1982):28–45.

¹¹Choh-Ming Li, *The Statistical System of Communist China* (Berkeley: University of California Press, 1962), p. 4; Gregory Grossman, *Soviet Statistics of Physical Output of Industrial Commodities: Their Compilation and Quality* (Princeton, N.J.: Princeton University Press, 1960).

¹²Harald Westergaard, *Contributions to the History of Statistics* (London: P.S. King, 1932), pp. 4–15; Lazarsfeld, "Notes on the History of Quantification in Sociology," pp. 153–64.

Modern statistical thinking has its roots in this English tradition of political arithmetic, a term coined by Petty and understandable in light of the predominantly commercial conception of arithmetic at the time. Working with rudimentary data, Petty creatively used ratios, weighted means, and other techniques to estimate population size, agricultural production, trade, tax revenues, and other variables. A follower of Bacon and Hobbes, Petty argued that the objective knowledge of society had to be founded on a science of number, weight, and measure. But he himself often treated numbers in a cavalier fashion, introducing hypothetical figures into chains of unsupported calculations.¹³ Other practitioners of political arithmetic further advanced the art of social measurement. John Graunt's 1662 study of the London bills of mortality is recognized as a landmark in demography and epidemiology.¹⁴ The astronomer Edmund Halley published the first life tables in 1693, and in 1696 Gregory King made the first statistically based calculations of national income.¹⁵

The central preoccupation of political arithmetic was the application of rational calculation to the understanding, exercise, and enhancement of state power. Petty's study *Political Arithmetick*, for example, is an effort to compare the military and economic resources of England, France, and Holland and to argue for the superiority of English power.¹⁶ (Such comparative arguments are still very much alive: Witness Raymond Vernon's chapter in this volume, which deals with analogous topics in a contemporary context.) Gregory King's work on national income was an effort to estimate potential revenue (in today's terminology, tax capacity). Similarly, the studies of mortality rates were prompted in part by the interest in calculating the cost of government annuities. The main use of political arithmetic, according to one of its practitioners, was to "help any ruler to understand fully that strength which he is to guide and direct."¹⁷

Although the contribution of Petty and his followers is now recognized as seminal, political arithmetic went into decline and eclipse in the eighteenth century. The political economists, such as Adam Smith,

¹³On Petty, see E. Strauss, *Sir William Petty: Portrait of a Genius* (London: The Bodley Head, 1954), and Peter Buck, "Seventeenth-Century Political Arithmetic: Civil Strife and Vital Statistics," *Isis* 68 (1977):67-84.

¹⁴John Graunt, *Natural and Political Observations Made upon the Bills of Mortality* [1662], ed. Walter F. Willcox (Baltimore: Johns Hopkins University Press, 1939).

¹⁵Gregory King, "Natural and Political Observations and Conclusions upon the State and Condition of England" [1696], in George E. Barnett, ed., *Two Tracts by Gregory King* (Baltimore: Johns Hopkins University Press, 1936), pp. 12-56. See also Paul Studenski, *The Income of Nations* (New York: New York University Press, 1958).

¹⁶William Petty, *Political Arithmetick* (London, 1690).

¹⁷Buck, "People Who Counted," p. 45.

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were skeptical of the reliability of available data.¹⁸ They also rejected the underlying assumptions about state guidance of economic life.

In the second half of the eighteenth century, according to Peter Buck, a broad ideological shift transformed political arithmetic from "a scientific prospectus for the exercise of state power" into "a program for reversing the growth of government and reducing its influence on English social and economic life."¹⁹ Instead of conceiving of people as subjects, the new work conceived of them as citizens. Buck writes: "In a society where all manner of government functions were being appropriated by local ruling elites, freeing political arithmetic from the ideological albatross of state power stimulated the development of the science by allowing it to reenter the domain of public controversy on new terms."²⁰

The term "statistics" entered the English language in the late eighteenth century, initially with the German meaning of facts about a state. The first book in English to use the term in its title was John Sinclair's *Statistical Account of Scotland*, a comprehensive social and geographical survey based on questionnaires sent to local clergy and published in twenty-one volumes between 1791 and 1799. By the 1820s statistics referred primarily—but still not exclusively—to numerical information. Statistical societies founded in Britain and the United States in the 1830s conceived of their goal as the gathering of objective facts, wherever possible to be numerical; yet many of the studies they supported or published were still nonquantitative. By the end of the nineteenth century, however, the transition to the modern meaning of statistics was virtually complete.

In its modern meaning, statistics has no necessary connection to the state. But that the word statistics comes from the same root as "state" testifies to an important stimulus of development: the demands of the modern state for social and economic intelligence.

Statistics and State Building

State building, as Charles Tilly has emphasized, has historically entailed a series of "extractive and repressive" tasks such as the organization of the military, tax system, and police.²¹ The development of statistical systems represents a subordinate, auxiliary task of the same kind. I have already mentioned the historical connection of censuses to

¹⁸Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* [1776], ed. Edwin Cannan (New York: Random House, 1937), p. 501.

¹⁹Buck, "People Who Counted," p. 28.

²⁰Ibid., p. 35.

²¹Charles Tilly, ed., *The Formation of National States in Western Europe* (Princeton, N.J.: Princeton University Press, 1975).

conscription and tax assessment. In a sense, all three are extractive—of men, money, and information.

The concerns of political arithmetic also clearly show the close association between statistics and state building. As the work of Petty, Halley, King, and other practitioners of political arithmetic suggests, the development of statistics and statistical thinking had a particularly close link to public finance. In early modern states, "where there are taxes, there are statistics."²² Not only did fiscal problems stimulate census-taking and political arithmetic; in Britain tax returns provided King with data for his estimates of population and national income.

More generally, state building and state-sponsored economic development prompted the wider collection of statistical information. In the seventeenth and eighteenth centuries, David Landes writes, the "mercantilist and cameralist states of Europe sought to promote economic growth for political ends and thereby were led to seek more precise and complete information than before on the conditions and economic activities of their subjects."²³ In this period, Prussia produced more data than most other European countries because of the extensive involvement of the Prussian monarchy in economic development.²⁴ For similar reasons, elaborate data are also available on the Spanish colonies in Latin America in this era. As John J. TePashke writes:

Spanish attempts to exercise tight control over the colonies led to a penchant for scrupulous accounting. Private sectors of economic life such as mining and trade were in many ways part of the public sector as well, scrutinized continually by authorities in Madrid and Seville demanding meticulous records of what was going on in the Indies. The very nature of Spanish imperial control probably makes it easier to reconstruct a statistically based picture for the Spanish empire than for the English colonies, where the private activities of merchants and storekeepers were not as much the business of His Majesty's Government.²⁵

As a general hypothesis, it seems reasonable to suggest that the more extensive the scope of state authority over economic and social life, the greater the scope, detail, and volume of statistical inquiry. However, other factors complicate any such generalization.

First, the interests of the state do not, of course, automatically call

²²Gregory Grossman informs me that this is an old axiom of economic history.

²³Landes, "Statistics as a Source for the History of Economic Development in Western Europe," p. 54.

²⁴Ibid.

²⁵John J. TePashke, "Quantification in Latin American Colonial History," in Lorwin and Price, eds., *The Dimensions of the Past*, p. 438.

up systems of thought. Before governments undertake to collect statistics, they must have some conception of the methods and uses of statistics. As Schumpeter remarks, the Roman empire, facing staggering problems in trade, money and finance, colonial administration, food supply, and slave labor, could have fully employed "a legion of economists," but the intellectual foundations did not then exist.²⁶ Furthermore, it is one thing to record and number people and things, but another matter entirely to create bodies of manipulable data. The records and results from early forms of data gathering, such as censusing, were not used to think statistically. Although the seventeenth-century Spanish empire may have kept more comprehensive accounts than did England or its colonies, the English led in statistical analysis. They gathered less numerical data, but they produced more statistical information.

Second, although more interventionist regimes may have a broader interest in statistical inquiry, they may also arouse more resistance and, therefore, be less able to generate reliable information. Consider the reasons cited by Landes for the less ample statistical output of France in the seventeenth and eighteenth centuries, compared with England, despite the greater involvement of the French state in regulating and promoting economic development. Chronically short of revenue, the French monarchy sold offices and farmed out taxes. The sale of offices, notes Landes, limited the administrative capacity of the government, while tax farming put tax collection in the hands of entrepreneurs who "had every interest in keeping the results secret." The efforts to extract more revenue from a population resentful of tax inequities "imbued the subjects of the king with a mistrust of anything connected with the state and an unwillingness to provide any information that might serve the ends of the fisc." As a result, "the French state found it hard to collect statistical data; was ill-prepared to collate and process such data as it did have; and since it really did not want to know the unpleasant truth, was prepared to tolerate the falsification of these data."²⁷

The French example underlines the importance of political legitimacy in generating reliable official statistics. The gathering of much statistical information requires wide cooperation. So long as statistics were associated with taxation and conscription, their potential development was limited, particularly insofar as the tax system itself was felt to be inequitable. Thus there may be some connection between statistical inquiry and the rise of representative government.

²⁶Joseph A. Schumpeter, *History of Economic Analysis* (New York: Oxford University Press, 1954), pp. 66-67.

²⁷Landes, "Statistics as a Source for the History of Economic Development in Western Europe," p. 61.

Statistics and Representative Government

In this volume, Kenneth Prewitt argues that official statistics make vital contributions to the working of democratic governments. Yet there can be little doubt that nondemocratic governments also find statistical information useful. What effect, then, if any, does democracy have on statistics? Is there any particular link that has encouraged or better enabled democratic governments to produce and distribute more statistical information, or particular kinds, or to use distinctive methods?

Clearly, one reason for the interest of democratic states in statistics may be the use of population data in distributing representation. The constitutional requirement of a decennial census in the United States stemmed from the decision to apportion the House of Representatives and Electoral College on the basis of population. Furthermore, this use of the census encouraged a change in the relation between census-taker and respondent. The traditional coupling of censuses with tax assessment had created a strong incentive for people and localities to under-report their numbers or refuse all cooperation whatsoever. The framers of the American Constitution thought they could overcome this problem by making political representation dependent on the count. As the accuracy of the census would depend on the disposition of the states, wrote Madison in *The Federalist*, No. 54,

it is of great importance that the States should feel as little bias as possible, to swell or reduce the amount of their numbers. Were their share of representation alone to be governed by this rule, they would have an interest in exaggerating their inhabitants. Were the rule to decide their share of taxation alone, a contrary temptation would prevail. By extending the rule to both objects, the States will have the opposite interests, which will control and balance each other, and produce the requisite impartiality.²⁸

Another connection between democracy and modern statistics may lie in the greater willingness of democratic states to make statistics public. Willcox argues that "there is a real connection between democratic forms of government, with their attendant publicity, and the taking of a census. . . . The modern census began in the United States in close association with democratic forms of government, and even at the start the results were immediately made public. Along with the growth of democracy in the nineteenth century there was an attendant spread of census taking."²⁹

²⁸Alexander Hamilton, John Jay, and James Madison, *The Federalist* (New York: Modern Library, n.d. [orig. 1787-88]), p. 359.

²⁹Willcox, "Census," p. 296.

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Yet another connection between democracy and statistics is the potential value of statistical information in the presentation and evaluation of competing claims for legislation. In this volume, Steven Kelman criticizes the standard approach of microeconomics, which explains government's role in producing information and other public goods as a response to "market failure." Relying on nineteenth-century U.S. congressional debates, Kelman argues that support for public provision of statistics was based primarily on political purposes, such as the need of legislators themselves for information (even about problems for which social or economic legislation was proposed but rejected).

However, between democratic government and the use of quantitative data lies the mediating variable of political culture. In the early years of the Republic, Congress was divided over whether to extend government statistical inquiries beyond the bare requirement of an enumeration. Supporters of broadened inquiry thought such information valuable in helping legislators serve their constituents. They conceived of society as consisting of diverse and competing groups, and they thought of politics as a sphere of interests. The opponents viewed the object of government as the pursuit of an undifferentiated common good; for them, politics was a sphere of virtue, and empirical investigation was irrelevant. By the mid-nineteenth century, empirical inquiry won increasing support. The growing scope of the census thus reflected the triumph of a liberal and pluralist conception of the democratic state.³⁰

Yet another reason why liberal democratic government may be particularly hospitable to statistics is its receptivity to diverse interest groups. As Kelman makes clear, the demands for statistics frequently emanated from the quest of groups for public recognition of their identity and importance. This is also a theme of William Petersen's chapter on the politics of ethnic enumeration.

Statistics measure, disclose, and publicize the accomplishments and problems not only of groups but of the nation as a whole. Kelman argues that nineteenth-century Americans supported the census partly because they saw it as producing evidence of national achievement and the success of American democracy. William Kruskal observes that a national census is a kind of collective self-portrait that serves to reinforce national identity.³¹ The connection here is not to democratic government per se but to national integration and nation building. Yet as the example of modern Lebanon indicates, in some circumstances no

³⁰Patricia Cline Cohen, *A Calculating People: The Spread of Numeracy in Early America* (Chicago: University of Chicago Press, 1982). Some passages in the text here come from my review of Cohen's book in *The New Republic*, February 13, 1984.

³¹William Kruskal, "Research and the Census," paper presented to the Congressional Research Service, Washington, D.C., January 26-27, 1983.

census is conducted for fear that its results may be destabilizing. Whether statistical information serves an interest in social integration and conflict resolution depends on the nature of political bargains and the relationship between social groups, local authorities, and the state. No fixed relationship should be assumed.

Statistics, Capitalism, and Culture

That capitalism encouraged a calculating mentality and thereby promoted statistical thinking in spheres other than business is an argument with a long heritage. Capitalism, in this view, is not merely an economic system but a civilization with a distinctive culture. The bourgeoisie, Marx and Engels wrote, drowned all sentimentality in "the icy water of egotistical calculation."³² Schumpeter argued that the economy was the "matrix of logic" and that capitalism could proudly take credit for increasingly quantitative habits of mind. For once "defined and quantified" in the economy, the rational habit of mind started "upon its conqueror's career subjugating—rationalizing—man's tools and philosophies, his medical practice, his picture of the cosmos, his outlook on life, everything in fact including his concepts of beauty and justice and his spiritual ambitions."³³

At least among the English, commercial bookkeeping was certainly taken as an exemplary lesson for government. This was the premise of political arithmetic. "Arithmetic," wrote John Arbuthnot, a seventeenth-century English mathematician, "is not only the great instrument of private commerce, but by it are (or ought to be) kept the public accounts of a nation. . . ."³⁴ Commerce provided the chief stimulus for acquiring basic numerical skills. Nonetheless, as Patricia Cline Cohen has pointed out, commerce ironically also impeded the spread of quantitative reasoning. Arithmetic was so widely understood as a commercial skill that it was long considered inappropriate for either general or elite education. Furthermore, texts in arithmetic were so thoroughly dedicated to commercial applications that its fundamental principles were ill understood and ill taught. The same mathematical operation would be presented as one rule for pounds and shillings, another rule for ounces and quarts. Because of the plethora of rules that needed to be memorized, arithmetic was believed to be extremely difficult to learn—and under those circumstances, it was.

The link between capitalism and numeracy relies heavily on a

³²Karl Marx and Friedrich Engels, "Manifesto of the Communist Party" [1848], in Robert C. Tucker, ed., *The Marx-Engels Reader*, 2nd ed. (New York: W. W. Norton, 1978), p. 475.

³³Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy* (New York: Harper & Row, 1950), pp. 123–24.

³⁴As quoted in Cohen, *A Calculating People*, pp. 28–29.

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presumed demand of capitalism for systematic accounting. Weber defined "a rational capitalistic establishment" as "one with capital accounting, that is, an establishment which determines its income yielding power by calculation according to the methods of modern bookkeeping and the striking of a balance."³⁵ Similarly, Sombart identified systematic accounting as a key characteristic distinguishing the capitalistic entrepreneur.³⁶ However, research into bookkeeping practices between the fourteenth and mid-nineteenth centuries—particularly the use of the double-entry form thought to be essential to capitalist enterprise—suggests that merchants used bookkeeping primarily as a record of accounts and not to calculate profits. Their main interest was to keep track of credit dealings with customers and suppliers and among partners; for such purposes, a simple form of bookkeeping sufficed. The more demanding double-entry system provides a more systematic analysis of profits and losses, financial condition, and return on capital, but it appears that merchants rarely carried through these calculations. "Description of assets appears to have been much more important than their 'quantification,'" writes B. S. Yamey. According to Yamey, household expenses, money received in dowries, and other domestic transactions were included in profit-and-loss accounts. "There is little evidence of a careful calculation and analysis of profits, and even less of any attention to the separation of business from domestic affairs."³⁷

Whatever its real application, double-entry bookkeeping represented an ideal of methodical organization that may have had some normative effect on governmental administration and hence on the development of official statistics. Yet it may be wrong to identify this kind of methodical procedure as originating from a raw economic need. As Weber and others have argued, the same concerns may be found elsewhere in the culture, as in religious life. In her study of the rise of numeracy and the spreading "domain of quantification" in Britain and America from the seventeenth through the mid-nineteenth centuries, Cohen argues that measurement met other than economic interests. "In fact, most seventeenth-century capitalists, traders, and mercantilists got along quite well without using the quantitative techniques—double-entry bookkeeping, geometrical gauging, national account books—that the quantifiers praised."³⁸ She also rejects a variant of the

³⁵Max Weber, *General Economic History* [1919/20] (New Brunswick, N.J.: Transaction Books, 1981), p. 275. See also Max Weber, *Economy and Society* [1922], ed. by Guenther Roth and Claus Wittich (New York: Bedminster, 1968), pp. 90–100.

³⁶F. L. Nussbaum, *A History of Economic Institutions of Modern Europe* (An Introduction to Sombart's *Der Moderne Kapitalismus*) (New York: F. S. Crofts, 1933), p. 160.

³⁷B. S. Yamey, "Scientific Bookkeeping and the Rise of Capitalism," *Economic History Review*, 2nd ser., 1(1949): 99–113.

³⁸Cohen, *A Calculating People*, p. 18.

Weberian argument about Protestantism that links religion to the development of numeracy, and instead suggests, in regard to seventeenth-century Britain, that it might be the "chaos and disorder of a revolutionary situation that directly encouraged a quantitative orientation."³⁹

Such unsettling conditions, in and of themselves, clearly cannot produce an interest in quantification, except perhaps in the context of particular intellectual traditions. Many accounts of the emergence of statistical inquiries emphasize the influence of Baconian empiricism. In each of the major Western countries where statistical institutions first developed it is possible to identify a line of intellectual descent, running from figures who provided broad philosophical orientations to those who carried out a program of quantification. In Britain, Bacon and Hobbes prepared the ground for Petty, who in turn prepared it for people like King; in the early nineteenth century, Malthus took part in the founding of the Statistical Society of London.⁴⁰ In Germany, Leibniz set out a program for official statistics.⁴¹ In France, some of the eighteenth-century *philosophes*, most notably Condorcet, envisioned a social mathematics.⁴² After these conceptual pioneers came the people who worked out the ideas in practice and translated them into institutions: in Britain, men like Rickman, Farr, and Chadwick; in Germany, Engel; in Belgium, Quételet; in France, Guerry and Villermé; in America, Jarvis, Walker, and Wright.⁴³ These early statisticians did not work in a cultural vacuum. By the early nineteenth century, as Cohen relates, the interest in quantification had become widely diffused in popular culture, political controversy, and the professions. She notes, for example, the growing popularity of gazetteers and almanacs with statistical data and the democratization of arithmetic through its simplification and introduction into the schools.⁴⁴

Throughout the West, capitalism no doubt encouraged quantifi-

³⁹Ibid., p. 43.

⁴⁰Michael J. Cullen, *The Statistical Movement in Early Victorian Britain: The Foundations of Empirical Social Research* (New York: Barnes & Noble, 1975), p. 79.

⁴¹Ian Hacking, "Prussian Numbers," in Daston, Heidelberger, and Krüger, eds., *The Probabilistic Revolution*; and Ian Hacking, *The Emergence of Probability* (London and New York: Cambridge University Press, 1975).

⁴²See Keith Michael Baker, *Condorcet: From Natural Philosophy to Social Mathematics* (Chicago: University of Chicago Press, 1975).

⁴³Cullen, *The Statistical Movement in Early Victorian Britain*; Hacking, "Prussian Numbers"; Lazarsfeld, "Notes on the History of Quantification in Sociology"; William Coleman, *Death Is a Social Disease: Public Health and Political Economy in Early Industrial France* (Madison: University of Wisconsin Press, 1982); Bernard Lecuyer and Anthony R. Oberschall, "The Early History of Social Research," in *International Encyclopedia of the Social Sciences*, vol. 15, pp. 36-53; Gerald N. Grob, *Edward Jarvis and the Medical World of Nineteenth-Century America* (Knoxville: University of Tennessee Press, 1978).

⁴⁴Cohen, *A Calculating People*.

cation by sweeping more people into a money economy. However, "needs" of the economy, like "needs" of the state, do not automatically call up systems of thought. Cultural influences and intellectual programs provided an independent stimulus to statistics, not reducible to material interests alone. Economic and political developments—the rise of capitalism, the modern state, and political democracy—reacted on a cultural base that already was disposed toward the methodical, rational outlook of which social and economic statistics were one product and expression.

The Path of Development

The production of official statistics has become more routine and grown in scale and sophistication, spans a wider domain of social life, and penetrates more deeply into the workings of society than it did during the formative, early stages of development. A rough parallel may be observed between the evolution of commercial and state accounting systems. Histories of business accounting suggest that there have been three phases to its development. The earliest, record-keeping, consisted of documenting transactions and can be traced to the first literate societies. Bookkeeping, the long intermediate phase, involved classifying transactions "according to a preconceived plan, as the basis for reporting the financial condition and all operating results of a business enterprise." The third phase, accounting, has seen the elaboration of financial analysis and control functions.⁴⁵ Official fact-gathering has followed a similar path. As the ancient censuses illustrate, the earliest inquiries were methods of registering and recording people and things, not of creating manipulable numerical data. Like bookkeeping, social and economic statistics in the West through the early nineteenth century involved relatively simple classification and analysis. The rise of modern national income accounting, economic indicators, and other tools of macroeconomic management and planning parallels the transformation of commercial bookkeeping into modern accounting.

We get a somewhat different framing of periods if we focus on the routinization and scope of official statistics as well as advances in complexity. The development of modern European economic statistics, suggests Landes, may be divided into three eras: (1) the "protostatistical era," running approximately through the eighteenth century, when governments were "desultory and incomplete in their collection and publication" of statistics; (2) the "first statistical era," roughly from the

⁴⁵James Don Edwards, "Early Bookkeeping and Its Development into Accounting," *Business History Review* 34 (1960): 446–58.

early nineteenth to the early twentieth century, when states came to realize numbers were too important to be left to chance and began to adopt a "systematic program of regular and fuller coverage" of certain indicators and to create permanent bureaucratic agencies for producing statistics; and (3) the modern or "second statistical era," signaled by the development of composite indexes of wages and prices and national income accounting, as "new conceptions of the role of the state and the character of economic change have made it desirable to go beyond the collation and arithmetical transformation of simple raw numbers and to create aggregative and analytical indicators of a much more highly processed character."⁴⁶

Landes's "first statistical era" began with what earlier historians sometimes described as an "era of statistical enthusiasm" in the 1820s and 1830s. Those decades saw not only a shift from episodic measurement toward routine monitoring of society but also a broadening of interests in what were then called "moral statistics." Governments began to measure and analyze health, education, and crime. The enthusiasm for these inquiries was stirred by a social movement, or at least a movement of intellectuals and administrators, the "statistical movement" of the nineteenth century, whose members founded the first statistical societies and congresses and propagated an ideology of objective fact-finding.⁴⁷ Moral statistics were a characteristic expression of the mid-nineteenth-century phase of genteel professionalism, which identified moral reform with scientific knowledge. Reform is, of course, a continuing theme in the making of statistical systems, but it is hard to say whether reformism led to statistics, or statistics to reform. The inauguration of labor statistics in the late nineteenth century was clearly prompted by industrial unrest. But were they created because of the power of the labor movement or labor reformers, or as a diversion of protest and aid to state policy dominated by employers? It is entirely possible that both may be true—for different actors whose joint action resulted in building labor statistical bureaus.⁴⁸

As I suggested earlier in discussing the effects of state intervention on statistics gathering, easy generalizations about the relation of state intervention to statistics should be resisted. To be sure, state planning does seem to promote an interest in statistics; the Soviet statistical system, according to official pronouncements, was created to support central planning.⁴⁹ However, the United States established its elaborate

⁴⁶Landes, "Statistics as a Source for the History of Economic Development in Western Europe," pp. 53–54.

⁴⁷Westergaard, *Contributions to the History of Statistics*, 136–71.

⁴⁸James Leiby, *Carroll Wright and Labor Reform: The Origin of Labor Statistics* (Cambridge, Mass.: Harvard University Press, 1960).

⁴⁹Grossman, *Soviet Statistics of Physical Output of Industrial Commodities*, pp. 13–21.

social and economic statistical systems without any commitment to planning. Indeed, statistics such as the modern economic indicators seem to have been introduced in the federal government as a substitute for planning. While planning requires elaborate data, so do Keynesian, welfare state, and even monetarist policies. If monetarists want to manage the money supply and to index wages, interest rates, and tax brackets, they need statistics about money, prices, and other variables. But they may not require or want other kinds of social statistics; more important, they may not organize or conceive the data in the same way.

Changing policy interests and ideologies clearly affect the domain of official statistical inquiry, but here we are in the realm of incremental decision-making mentioned at the outset of this section. Once the foundations and framework for official statistics have been established, the decisions about what to measure belong to the everyday world of political conflict and coalition building.⁵⁰ Also at work are cycles of faith and skepticism in the power of rational management and the social sciences. Enthusiasm for statistical enterprises such as social indicators rises—and falls. The inability of such movements to secure political support should not always be interpreted as a sign of the limits of policymaking. Though they may have the patina of rationalism, movements on behalf of statistics are not always rational in strictly relating means and ends. For those with a deep belief in the blessings of information, the means become an end. Political leaders who must raise taxes and voters who must pay them cannot always afford such expensive tastes.

II. The Social Organization of Statistical Systems

No social scientist has yet attempted any systematic, comparative analysis of the organization and politics of the statistical process (in the vein, for example, of Wildavsky's studies of the budgetary process).⁵¹ However, suggestive studies of statistical institutions as well as methodological criticism of official statistics help to identify sociologically relevant issues in the design and workings of statistical systems. These issues may be grouped into two general categories: the politics of organizational structure and the sociology of the statistical process.

⁵⁰For the classic incrementalist view, see Charles E. Lindblom, "The Science of Muddling Through," *Public Administration Review* 19 (1957): 79–88, and Aaron Wildavsky, *The Politics of the Budgetary Process* (Boston: Little, Brown, 1964).

⁵¹*Ibid.* and Aaron Wildavsky, *Budgeting: A Comparative Theory of Budgetary Processes* (Boston: Little, Brown, 1975).

The Politics of Organizational Structure

Statistical systems take a variety of organizational forms. The division of statistical labor typically involves different bureaucracies and levels of government, the private as well as public sector, and various professions. Choices in organizational design have a bearing on the functional autonomy of statistical institutions; the ability of different actors to secure statistical information relevant to the decisions they face or useful for the pursuit of their claims; ingrained tendencies toward over- or undercounting or errors of classification; and the control over access to information, including the release of information damaging to individuals, agencies, or governments as a whole. In short, the division of statistical labor affects the social distribution of knowledge and power.

At least four such divisions have been persistent matters of political contention:

1. *Central statistical offices versus statistical branches of operating agencies.* Government at every level faces a choice between concentrating statistical activities and competence in a central professional agency and dispersing statisticians among various operating departments. This is an instance of the general problem of choosing between functional and divisional forms of bureaucratic structure. The choice is not, of course, necessarily either/or, since some statistical functions may be concentrated and others dispersed. Some countries, such as Canada, have chosen to create central statistical offices; others, such as the United States, have not. The U.S. Bureau of the Census does represent a highly professionalized statistical agency, but by no means have all federal statistical activities been centralized in it.

Like other professionals, statisticians often prefer independent organization because it allows them more professional autonomy and collegiality. However, such independence may come at the expense of influence over policy. Policymakers and administrators often prefer to have statisticians dispersed in operating agencies because it gives them more authority to direct the statisticians to produce useful data and perhaps more favorable measures of their own performance. On the other hand, an independent professional agency may have higher technical standing and the ability to recruit more highly qualified statisticians. The political problem is to reconcile the advantages and risks of the alternatives. As Margaret Martin puts it: "If the statistics bureau is too close to policy planning and analysis, it runs the risk of becoming partisan. If it is too insulated from policy considerations, the statistics

bureau may be perceived and treated as . . . a mere numbers factory. . . .⁵²

2. *National/local divisions of labor.* A second problem of centralization is the allocation of statistical activities or functions among levels of government. For example, even if a census is carried out on a national scale, some aspects of it may be decentralized: (a) The enumerators may be local officials, local clergy, or paid agents responsible to local authorities, rather than permanent employees of the central government; (b) the census returns themselves may be left in the hands of local or provincial governments, with only summaries sent to the central government, instead of being transmitted in full; (c) analytical capacities may be dispersed in provincial or state governments; and (d) control over public access to information may be given to local authorities.

Conflicts over these choices appear throughout the literature on the history and politics of statistics. Early modern censuses typically relied on parish records or local clergy, the overseers of the poor, or other local officials to gather data. As a result, they embedded the production of statistics in local status relations and religious conflicts.⁵³ Like the coupling of censuses with taxation, the use of such sources or agents inhibited accurate disclosure and thereby distorted the data. Moreover, if the records or clergy of an established church were the sources of information, the statistics sometimes entirely omitted or provided inadequate coverage of dissenters. The historical shift toward paid, secular agents of central governments represented a key change at the "base" of the social structure of official statistics.

Recent protests against a national census in West Germany stemmed in part from a design that potentially allowed local authorities access to personal information about individuals. The West German system is one of those in which the provincial governments transmit only summaries of data to the federal level, whereas in the United States the federal government controls and processes all census returns.⁵⁴ In the United States, according to Judith deNeufville's chapter

⁵²Margaret E. Martin, "Statistical Practice in Bureaucracies," *Journal of the American Statistical Association* 76 (March 1981):1-8. See also James T. Bonnen, "Federal Statistical Coordination Today: A Disaster or a Disgrace?" *Milbank Memorial Fund Quarterly/Health and Society* 62 (1984):1-41; Claus Moser, "The Role of the Central Statistical Office in Assisting Public Policy Makers," *The American Statistician* 30 (1976):59-67; and United Nations, "The Organization of National Statistical Services: A Review of Major Issues," *Studies in Methods, Series F*, No. 21 (New York, 1977), pp. 7-10.

⁵³Buck, "People Who Counted."

⁵⁴William P. Butz, "Data Confidentiality and Public Perceptions: The Case of the European Censuses," paper presented to the Population Association of America, Minneapolis, May 3, 1984.

in this volume, "dependency in statistical production" limits the ability of local governments to meet their own, highly particular needs for demographic and economic data. On the other hand, according to the chapter by Janet A. Weiss and Judith E. Gruber, decentralized authority over the schools in the United States has prevented the federal government from obtaining consistent and relevant educational statistics. Federal officials lack the power to compel the states to produce data that might reflect badly on their performance. Even in the same society, therefore, both local and national governments may experience dependency in statistical production in different institutional spheres.

3. *Public/private divisions of labor.* Private-to-public transitions in the production of statistics have been common in the history of statistical systems. Many kinds of statistics have been pioneered by private individuals or reform organizations and then taken over by the state. The private efforts of eighteenth- and nineteenth-century English and American reformers in producing labor, public health, and poverty statistics are good examples.⁵⁵ But particularly in recent years, there have also been public-to-private transitions, as some governments have abandoned the collection, analysis, or distribution of data on the grounds that those functions were being—or could be—undertaken in the private sector.

Accounting for such transitions takes us back to the first class of problems—what do governments count?—but with more of an emphasis on the exchanges, relations of interdependence, and potential conflicts between the public and private sectors in the performance of statistical functions. Even if government chooses to count, it may not be the only producer of data. A key difference between American and Soviet economic forecasting, as Leonard Silk observes, is that in the United States "official economic reporting and forecasting are heavily constrained by the competition of private economists, analysts, businessmen and reporters, whereas the Soviet variety can exist in a cloud-land of its own."⁵⁶ When the Commerce or Treasury Departments make projections of economic growth, unemployment, and budget deficits, their projections compete for influence with those of other public sources, such as the Congressional Budget Office, as well as numerous private forecasters. Pluralism is as important a check on the performance of statistical agencies as it is on other organizations. However, governments even in pluralist societies still have a monopoly in producing much raw statistical data because of the sheer cost of production. Therefore, many governmental decisions in the construction of

⁵⁵See Cullen, *The Statistical Movement in Early Victorian Britain*, and Lecuyer and Oberschall, "The Early History of Social Research."

⁵⁶Leonard Silk, "U.S. vs. Soviet Forecasting," *The New York Times*, January 4, 1984.

the data—such as the categories used in official questionnaires—rule out alternative conceptions. Moreover, because of the unique authority of official statistics, private agencies cannot always compete effectively for attention or credibility. Nonetheless, the presence of private statistical criticism and analysis represents a key difference in the functioning of statistical systems between totalitarian and liberal societies.

4. *Bureaucratic/academic divisions of labor.* Like private companies, the academic social sciences, based in institutions enjoying relative autonomy from the state, constitute a partial check on official statistics. Moreover, the universities are the source of much training for the government's own statisticians and social scientists, and the disciplines constitute a key reference group for bureaucratic analysts. On the other hand, academic professionals often depend on bureaucratic professionals for raw data as well as contracts and grants. The role of academic analysts may be high in the early stages of statistical work (such as the formulation of problems and the design of questionnaires), fall through the middle phases of data collection, and then rise again in the latter stages of analysis, interpretation, and public dissemination.

A key question here is the extent of information processing undertaken by official agencies. The more processing is completed in the deep recesses of the bureaucracies, the less able are independent private and academic analysts to unscramble the categories, change the assumptions, and generate alternative data. However, such tasks may, in effect, be spun off by data producers. In his chapter on population forecasting in this volume, Nathan Keyfitz points out that by offering a range of forecasts instead of a single point, demographers have partially ceded to the users of the data the responsibility for choosing among assumptions. The division of labor here is not between bureaucratic and academic analysts but rather between producers and users (who may themselves be researchers, policymakers, or other information consumers). As computerization becomes more widespread and less costly, it permits more independent processing of statistical data by users further "downstream." Instead of being distributed in the relatively fixed medium of printed tables, the data are increasingly distributed in more manipulable electronic form. In this way, computerization may change the distribution of statistical labor, somewhat reducing centralization.

The Sociology of the Statistical Process

I turn now from structural alternatives in the organization of statistical systems to the social relations of the statistical process. By the

statistical process I mean the sequence of activities in the production and dissemination of statistics. In official statistical agencies these activities are organized temporally in a production cycle. For purposes of analysis, the cycle may conveniently be divided into several phases: (a) the design of cognitive instruments (such as questionnaire items, classification systems, coding instructions, etcetera) and the planning and fielding of an administrative apparatus for data production; (b) a primary phase of collection consisting of contact and interaction with respondents and the entry of data by respondents, enumerators, or other officials; (c) intermediate social processes, consisting of the transmission and processing of data through various levels of organization; and (d) the higher levels of analysis, representation, and disclosure of data by official agencies. Many of the questions about the design and analysis of statistics I have deferred until the next section on cognitive organization. Under this heading, I primarily consider the possible effects of social relations on statistics production.

1. *Methods of data collection: census, survey, and administrative data.* A choice of statistical sources or methods is a choice of social processes for the generation of data. Censuses and sample surveys are more structurally differentiated processes of social measurement; the production of data is their specific, manifest function. Hence professional statisticians are more likely to assume a dominant role. Administrative data, on the other hand, are generally by-products of bureaucratic processes conducted for other purposes and not controlled by statisticians. Such data are often used for monitoring bureaucratic and professional performance and may, therefore, be particularly subject to image-conscious manipulation. Administrative data are also particularly sensitive to vagaries of bureaucratic policy or procedure unrelated to the external social phenomenon they may be taken to measure. For example, changes in budgets, personnel, and internal incentives and controls such as quotas for cases opened or closed are likely to influence administrative measures of crime, illness, and other forms of social deviance. Rules of eligibility and other screening mechanisms filter administrative readings of poverty, unemployment, homelessness, and other forms of social distress. The very devices that screen out claims on public revenue may produce lower measured rates of distress than would surveys of the general population—a feature that may lead administrative data to be quoted by those in office and denounced as misleading by their critics. Unemployment data generated by unemployment insurance agencies, crime statistics produced by police, health statistics from hospitals and other medical facilities—all such statistics are deeply embedded in local bureaucratic practice and professional cultures and may, therefore, have limited value for comparisons

across societies or over time. To be sure, some of their limitations may be overcome through surveys of crime victimization, unemployment, and illness in the general population. However, no technical method is free of social process. In a sense, all data are administrative since none can be gathered without an administrative apparatus and without formal rules for classification.

The choice between censuses and sample surveys has political, cultural, and economic aspects. In the United States, the Constitution calls for an enumeration every ten years, a requirement interpreted to demand a complete population census. In the nineteenth century, this specific authority led to the concentration of federal statistical inquiries in the decennial census, since it was disputed whether the government had authority to undertake other forms of social research. In the twentieth century, on the other hand, the rise of alternative and cheaper methods of inquiry has raised doubts whether a full census is necessary, but the constitutional language stands as a barrier to change. (Another reason for maintaining a national census is that, unlike surveys, it provides data on small areas, which are required for many allocative purposes.) Whether the constitutional requirement of an enumeration allows any estimation procedures—for example, adjustments for population undercounts—became an important point in the legal disputes over the 1980 census. The Census Bureau held that the Constitution did not allow any adjustment, even though census procedures already call for imputing characteristics to households and individuals who do not return census forms and cannot be located by interviewers.⁵⁷

Despite professional cautions that censuses may be subject to errors as great as, or larger than, errors in surveys, censuses appear to retain greater cultural and political authority. A national census involves general public participation in a collective "self-portrait." A count, furthermore, seems a relatively straightforward task. On the other hand, surveys do not constitute public events in themselves, and the logic of sampling is more difficult to comprehend. When a federal agency in the 1930s first used random sampling for a study of the distribution of wealth, the U.S. Chamber of Commerce, displeased with the findings, dismissed them as based merely on a sample and "a random sample at that!"⁵⁸ The gradual acceptance of sampling in the twentieth century constitutes a significant change in our political culture.

⁵⁷David Seidman, "Numbers That Count: The Law and Policy of Population Statistics Used in Formula Grant Allocation Programs," *George Washington Law Review* 48 (January 1980):229-67; Note, "Demography and Distrust: Constitutional Issues of the Federal Census," *Harvard Law Review* 94 (1981):841-63.

⁵⁸Joseph W. Duncan and William C. Shelton, *Revolution in United States Government Statistics, 1926-1976* (Washington, D.C.: U.S. Department of Commerce, 1978), p. 41.

Despite the greater authority of censuses, governments increasingly rely on periodic surveys and administrative data for more frequent information. This pattern reflects not only the demand for more up-to-date information but also the steep rise in the costs of interviews relative to the costs of manipulating computerized records.⁵⁹ Nonetheless, the national population census remains the central and archetypal statistical enterprise, and it may well survive, despite expense, because of its broader social functions.

2. *Respondent compliance and disclosure.* Response to official sample surveys is generally voluntary and without financial reward, whereas filling out forms for welfare, police, tax collection, and other agencies is typically mandatory and backed by significant rewards or penalties. This difference may produce higher compliance but less reliable disclosure in administrative statistics and, conversely, lower compliance and more reliable disclosure in surveys. In national censuses responses are legally required, but the sanctions for noncompliance are generally less severe than for failing to turn in, say, income tax returns. As previously indicated, the volume and reliability of response to censuses may reflect the level of public trust of governmental authorities, particularly confidence in the segregation of statistics from surveillance, taxation, and law enforcement.

Noncompliance may be divided into two categories: individual and collective. Individual nonresponse has been a rising problem for social research of all kinds in the postwar era in Western Europe and the United States. One recent study attributes this secular tendency, not to methodological deficiencies, but to growing public anxieties about invasions of privacy.⁶⁰ Nonresponse may also take the form of organized collective action: a "statistics strike" in which respondents refuse to complete forms and thereby deny a government statistical information.⁶¹ The cancellation of West German censuses in the early 1980s resulted from a threatened statistics strike by about one fourth of the population, as measured by public opinion polls. Opposition to the census arose from feared invasions of privacy, prompted by the government's decision to use it as an opportunity to fill gaps in official local registers of inhabitants. Since census forms did not separate individuals'

⁵⁹Wendy Alvey and Fritz Scheuren, "Background for an Administrative Record Census," in Wendy Alvey and Beth Kilss, eds., *Statistics of Income and Related Administrative Record Research: 1982* (Washington, D.C.: Department of the Treasury, 1982), pp. 47-62.

⁶⁰John Goyder and Jean McKenzie Leiper, "The Decline in Survey Response: A Social Values Interpretation," *Sociology* 19 (1985):55-71.

⁶¹Government Statisticians' Collective, "How Official Statistics Are Produced: Views from the Inside," in John Irvine, Ian Miles, and Jeff Evans, eds., *Demystifying Social Statistics* (London: Pluto Press, 1979), p. 142.

names from answers to questions about personal matters such as income, many West Germans became concerned that the local authorities might use the returns for tax enforcement or to prosecute people who had given false information to registration authorities. Early opposition from the radical Green Party gradually spread to a broad spectrum of the population, and the West German courts canceled an already postponed census planned for April 1983.⁶²

In striking contrast, American protests before and after the 1980 census were directed at the probable undercount of minorities and metropolitan areas and sought legal recognition of a "right to be counted." Cities and minority groups mobilized to get the maximum numbers to fill out returns, as they might mobilize to get out the vote in an election.⁶³

The explanation for the difference in collective patterns of response to census plans may lie in the incentives created by the political systems. In America, but not in Germany, the census is the basis for major distributional decisions. The stakes have interested the public in being counted. In the *Federalist Papers*, Madison suggested that by apportioning both representatives and taxes according to population, the Constitution would secure a balance of interests that would lead the states neither to swell nor to reduce their reported population. But the balance no longer exists. Federal aid to states and localities now depends on their population, but tax burdens are not similarly allocated. The Sixteenth Amendment, allowing a federal income tax, exempted it from the requirement that direct taxes be apportioned according to the census. This political factor, rather than objective deficiencies in the census, probably explains why census controversy in the United States now focuses on undercounts rather than other problems, such as possible overcounts.⁶⁴

The controversy over census undercounts, however, underlines the important point that noncompliance has a social distribution. In a sense, the problem is analogous to nonvoting, particularly because statistics are used to allocate representatives and to represent social realities. Thus the campaigns for census compliance, adjustments for minority undercounts, and more intensive sampling of minority popula-

⁶²"Standing Up to the Counters," *New Statesman*, April 15, 1983, and Butz, "Data Confidentiality and Public Perceptions: The Case of the European Censuses."

⁶³On the conflicts over the 1980 census, see Ian I. Mitroff, Richard O. Mason, and Vincent P. Barabba, *The 1980 Census: Policymaking Amid Turbulence* (Lexington, Mass.: Lexington Books, 1983); Bryant Robey, "Adjusting for Census Undercount: The Statistical Nightmare," *American Demographics* (February 1980):18-23, 46; Myron Magnet, "Behind the Bad-News Census," *Fortune*, February 9, 1981; Seidman, "Numbers That Count."

⁶⁴Daniel Melnick, "The 1980 Census: Recalculating the Federal Equation," *Publius: The Journal of Federalism* 11 (Summer 1981):39-65.

tions may be viewed not only as issues of technical adequacy but also as a kind of statistical counterpart to affirmative action.

3. *The social relations of data collection.* Almost all statistics come from answers to questions, and questioning inevitably entails a social relation. Even if the questions appear impersonally on a form, the "government" is asking for information and the answers may be shaped by the respondents' relation to the government—their interest in cooperating, fear of scrutiny, or differences in language and understanding. If interviewers or governmental functionaries ask the questions, their identity and role may influence the transaction. Changes in the makeup of both groups, questioners and questioned, may have major consequences. Thus the growing proportion of women working outside the home has reduced the available supply of educated, low-paid, unthreatening census enumerators as well as the probability of finding a woman respondent at home during the day. This kind of social change may lie behind the narrower economic calculations that have dictated reliance on mailed census questionnaires.

Several general perspectives are evident in the analysis of the social relations of data collection. One emphasizes the rational calculations of respondents and other agents in the statistical apparatus. In this view, official statistics are a function of the strategic behavior of actors at all levels of a statistical system. This approach may be found in Oskar Morgenstern's classic study *On the Accuracy of Economic Observations*. Morgenstern notes, for example, that one difference between "describing a statistical universe made up of physical events exclusively and one in which social events occur" is that people may lie, be evasive, or misunderstand the questions asked of them. Nature does none of these. As Einstein once said, "The Lord God is sophisticated, but he is not malicious."⁶⁵ Misrepresentation in the reporting of social and economic data, on the other hand, may inspire countermeasures by those designing statistical inquiries, creating what Morgenstern refers to as "a non-strictly determined two-person game where both sides have to resort to mixed or 'statistical' strategies."⁶⁶

The opportunity for strategic behavior in data reporting is greatly increased by ambiguities of classification and the sheer complexity of some calculations. Without actually lying, respondents such as corporations being questioned about their financial condition may choose to report to the government figures conveniently different from those they use internally. The story is told of a series of interviews for a job as an auditor in a Soviet factory. "How much is two and two?" asks the

⁶⁵Oskar Morgenstern, *On the Accuracy of Economic Observations*, 2nd ed. (Princeton, N.J.: Princeton University Press, 1963), pp. 17–18.

⁶⁶*Ibid.*, p. 22.

manager. "Four," says the first candidate, who is promptly dismissed. Asked the same question, the second job-seeker says "Five"—and obviously he won't do, either. Finally, the third candidate is asked the question, and he responds, "How much do you need?" That man gets the job.⁶⁷ The same story might easily be told of creative accounting in the West. It is a commonplace of accounting that numbers are not absolute; they are a policy decision. As Morgenstern argues, any corporate balance sheet consists of values ranging from precisely known, highly liquid assets to others that are purely speculative estimates, such as the value of trademarks.⁶⁸ Even within the limits of standard accounting practices, the opportunity for strategic data reporting is vast.

A second approach, common among sociologists influenced by phenomenology, emphasizes the varying interpretations of categories and evidence by those who enter data used for official statistics. A critical analysis of official suicide data by Jack Douglas exemplifies this perspective.⁶⁹ The conventional view, represented in sociological studies of suicide since Durkheim's classic work, is that the identification of suicide is unproblematic; if suicide statistics suffer from any deficiencies, it is underreporting because of concealed cases. Hence the reported rates are generally assumed to be low estimates. Douglas shows that the difficulties are much more serious.

To categorize a death as a suicide, one must resolve several types of ambiguity. In the case of a man found dead, for example, coroners, police, or other officials must decide whether he died of natural causes, killed himself, or was murdered; second, if he killed himself, whether he took the action that killed him accidentally or intentionally; and third, if intentionally, whether he knew the action would kill him. Labeling a death a suicide clearly involves attributing an intention to the deceased, which means interpreting his state of mind. This interpretation is often highly conjectural. About many deaths, such as drownings and one-car accidents, the evidence is often minimal; suicide is, so to speak, in the eye of the beholder. Counting up such categorizations does not make them any less interpretive, and calling them official does not make them any less problematic.

Although most definitions of suicide include the idea of an intention to die, even the legal definitions in different countries, let alone the local coroners and police, do not agree about the meaning of suicide and how to infer intention. Douglas argues that official rules and practices for identifying cause of death vary in the objective criteria for assigning

⁶⁷The story comes from Gregory Grossman.

⁶⁸Morgenstern, *On the Accuracy of Economic Observations*, pp. 70–87.

⁶⁹Jack D. Douglas, *The Social Meaning of Suicide* (Princeton, N.J.: Princeton University Press, 1967), esp. pp. 163–231.

cases to categories, the weight given to conflicting evidence for those criteria, and the "search procedures" for discovering evidence or evaluating reports. And since the moral connotations of suicide vary, so does the willingness of family and officials to categorize deaths as suicides.

Durkheim himself dismissed official statistics about the *motives* for suicide on the ground that these "are actually statistics of the opinions concerning such motives of officials, often of lower officials, in charge of the information service." Durkheim continued: "Unfortunately, official establishments of fact are known to be often defective even when applied to obvious material facts comprehensible to any conscientious observer and leaving no room for evaluation. How suspect must they be considered when applied not simply to recording an accomplished fact but to its interpretation and explanation!"⁷⁰ Yet, as Douglas argues, Durkheim failed to see that the suicide statistics themselves were records not of simple facts but of interpretations. Moreover, the same forces that Durkheim saw influencing suicides may instead have been influencing the attribution of suicide by official agencies. For example, Douglas suggests that the better integrated a deceased individual was in the community, the less likely is the coroner to conclude that the person committed suicide; and the more highly integrated the family of the deceased, and hence the closer their relationship to doctors, police, and other officials, the less likely those officials may be to impute suicide over the family's objections. Virtually any argument for the relation of a social factor and suicide rates can be plausibly reconstructed as a relation between the same factor and the rate of suicide attributions. Without ascertaining the magnitude of possible effects on attributions, it is difficult to identify the "true" or at least a consistent suicide rate. In other words, suicide cannot be analyzed through the prism of official statistics without also analyzing the sociology of the statistical process.

Like Morgenstern's work, which also emphasizes inconsistencies of interpretation as well as strategic behavior, the phenomenological approach critical of official statistics is deeply threatening to the entire enterprise of official statistics and the research based on it. Economists have generally ignored Morgenstern's cautions, despite his considerable prestige; sociologists have given somewhat more attention to the phenomenological criticism, particularly in the study of deviance.

In a rebuttal from a Marxist perspective, Hindess insists that official statistics are "in no way reducible to the subjective experience

⁷⁰Emile Durkheim, *Suicide* [1897] (New York: Free Press, 1966), p. 148, cited by Douglas, *Social Meaning*, p. 174.

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of enumerators and other officials," but rather are "the product of a determinate process of production of knowledge governed by a determinate system of concepts." In support of this position, Hindess analyzes an Indian agricultural census of 1950 in which the categories of income seem to have been drawn from classic British texts of political economy. He argues that the grave problems of classification in this census arose not from the subjective orientations of the interviewers but from the structure of official categories, which inadequately represented the categories of Indian land tenure.⁷¹ Whatever the merits of this analysis, the one case scarcely shows that interactive and interpretative factors never come into play in the generation of official data. But it does underline the potential for ambiguity and error arising from a severe mismatch between official categories and patterns of social life.

4. *The social relations of data processing.* The same arguments about the effects of social interaction on data collection have been made about the intermediate social processes of data production. Administrative statistics, as already mentioned, are particularly subject to pressure because of their use in performance monitoring. In an authoritarian regime, the problem of falsification arises not merely because the regime may lie but because subordinate officials in industry and regional government have good reason to lie to their superiors. Hence progressively larger distortions may appear as information travels up the hierarchy. In a paper on Chinese statistics, Orleans wryly suggests "the greater the number of administrative plateaus which serve as resting places for statistics as they are moved up the line, the less accurate are the figures."⁷²

Data processing is a form of work—and in modern societies an increasingly important form. The production of statistical data is, among other things, an industrial process, or labor process, in which large numbers of clerical workers perform routine tasks and are supervised by several levels of administrators and professionals. The distribution of knowledge and control over this work repeats the more general industrial pattern—the concentration of conceptual and planning functions among a relatively small class. In the organization of statistical work, a minority of professionals understands the system and can spot errors. For the majority, on the other hand, the work itself is virtually meaningless. Consequently, they are likely to have neither the interest nor

⁷¹Barry Hindess, *The Use of Official Statistics in Sociology: A Critique of Positivism and Ethnomethodology* (London: Macmillan, 1973), p. 56.

⁷²Leo Orleans, "Chinese Statistics: The Impossible Dream," *The American Statistician* 28 (May 1974):51.

the capacity to identify mistakes.⁷³ Computerization may eliminate some routine clerical tasks and increase the demand for employees with statistical competence, but it seems unlikely to change the basic hierarchical structure of data production.

5. *Disclosure and dissemination: government falsification, statistical blackouts, and the social distribution of public data.* Just as respondents and intermediate officials may falsify statistical reports, so may governments. Morgenstern notes that even the Bank of England for years deliberately misreported its gold reserves.⁷⁴ The professionalism of statistical agencies is a partial barrier to "political" tampering with official statistics, but there are numerous examples of misrepresentation. Rather than outright falsification, more common techniques include deceptive use of classifications and tolerance of methodological inadequacies that yield data with useful political effect. For example, many countries in Latin America appear to have underreported infant mortality rates by allowing many infant deaths to go unrecorded.⁷⁵

Statistical blackouts are, in some respects, a functional alternative to misrepresentation and tolerated error. By a statistical blackout I mean the reverse of a statistical strike—that is, the refusal by a government to release statistical data to the public. In Communist China, according to Orleans, 1960 marked "the beginning of a virtual blackout of statistical information."⁷⁶ At that time, the Chinese published little statistical information compared to the Soviet Union. Since the late 1970s, however, the Chinese have disclosed more statistical information, while the Soviets have published less. These changes seem to reflect more general tendencies toward "closed" and "open" societies. Thus the volume of statistical output may itself be an interesting indicator of political culture. However, statistical blackouts may also be understood in more strategic terms. The Russians stopped publishing data about infant mortality in the early 1970s, when the figures seem to have grown embarrassingly high. They cut off statistics of grain production when the Carter administration imposed its grain embargo. Altogether, about thirty major items disappeared from the Soviet statistical yearbook in the decade after 1974, according to Murray Feshbach.⁷⁷

⁷³Government Statisticians' Collective, "How Official Statistics Are Produced: Views from the Inside," pp. 130–51.

⁷⁴Morgenstern, *On the Accuracy of Economic Observations*, p. 20.

⁷⁵José Carlos Escudero, "On Lies and Health Statistics: Some Latin American Examples," *International Journal of Health Services* 10 (1980):421–35.

⁷⁶Orleans, "Chinese Statistics: The Impossible Dream," p. 49.

⁷⁷Cullen Murphy, "Watching the Russians," *Atlantic Monthly*, February 1983, p. 51 (quoting Feshbach); Amity Shlaes, "Soviet Watchers Face Growing Secrecy on Kremlin's Economic, Crop Statistics," *The Wall Street Journal*, February 2, 1984.

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Furthermore, even when the Soviets do publish data, they often fail to explain their methods or change definitions without notice. "Such statistical bad manners," observes Walter Laqueur, "have the same effect as outright disinformation."⁷⁸

Ironically, the United States has become the "leading world supplier" of Soviet economic statistics.⁷⁹ The Soviets themselves seem to be relying on American figures. Gregory Grossman points out that the Soviet press sometimes quotes Western reports on Soviet economic performance because of the implicit recognition that Western statistics will have more authority even for the Soviet public.⁸⁰

Not all data are made public in the United States. For example, the budget of the Central Intelligence Agency is secret. There have also been charges that some data series in the United States have been discontinued, or never developed despite congressional authorization, because of fears that they might hurt the administration in power.

Other factors besides decisions about disclosure affect the social distribution of statistical information. Governments face politically significant choices among technologies of dissemination (books, computer tapes, online electronic services); methods for setting prices; options for marketing and publicity; and contacts with various groups of data users, such as commercial organizations, local governments, the mass media, universities and schools, and ordinary citizens.

Patterns of choice in the distribution of public data influence the level of information inequality in a society. No doubt public data in a liberal democracy are a resource more equal in their distribution than proprietary information. But the same public data may have immensely greater value to those who have the skills and resources for analysis than to those who do not. The distribution of statistical competence and analytical resources, such as access to computers, varies greatly in society, not only among individuals but also among businesses, local governments, and community organizations. Stronger and more vocal forces are also better able to use channels of influence to secure the kind of data that serve their interests. The distributional patterns, therefore, have a feedback effect on the cognitive organization of statistics. I turn to that topic next.

⁷⁸Walter Laqueur, *A World of Secrets: The Uses and Limits of Intelligence* (New York: Basic Books, 1985), p. 42.

⁷⁹*The Wall Street Journal*, February 2, 1984.

⁸⁰Personal conversation, Berkeley, California.

III. The Cognitive Organization of Statistical Systems

By the cognitive organization of statistical systems, I mean the more or less permanent ways in which statistical instruments and data are structured to produce information.⁸¹ One way to conceive the cognitive function of statistical systems is that they serve to bring about a progressive reduction of complexity. Social conditions and the activities and characteristics of people are myriad and subtly varied; statistical inquiries must be limited to particular items and categories of response. Yet the raw data thereby collected can be combined and analyzed in sundry ways; scarce cognitive as well as economic resources dictate that only some routes of analysis be followed. Even so, the data and analyses churned out by statistical agencies are too much for the political system and media of communication to absorb. Hence yet another reduction of complexity must be performed by a variety of intermediaries who interpret the data for public consumption.

At each stage in this progressive reduction of complexity, some information is lost as other information is created. Technical criteria alone do not dictate the choice. The statistical information sought—and hence the procedures for combining, analyzing, and representing the data—depends on the purposes in view. The professionals and administrators who design official statistics must, therefore, not only apply their technical competence but also interpret political and social objectives for the data. Their choices will also depend on accepted beliefs about the nature of social reality. Once again, even if unconsciously, they are engaged in a kind of interpretation, choosing a language for inquiry and analysis that does not jar cultural or ideological presuppositions. For so long as their choices fall comfortably within the dominant societal consensus, their judgments are likely to be accepted as objective (by all but philosophers and sociologists). It is where political and cultural conflict and ambiguity exist that the designers of statistical information are likely to experience the greatest anxiety and pressure. In those cases, they may face protests over decisions that sacrifice one sort of information in the interests of producing another kind.

Controversy, however, is only a manifest sign of the political choices that otherwise lie latent and obscure in the cognitive organiza-

⁸¹Here—and generally throughout this chapter—I follow a distinction proposed by Daniel Bell. Data, information, and knowledge, he suggests, may be distinguished according to the complexity of organization of their elements: *Data* are the least organized, whereas *information* is "a pattern or design that rearranges data for instrumental purposes" (that is, for decisions), and *knowledge* consists of the "reasoned judgments" that integrate information at a more abstract level. See Daniel Bell, "The Social Framework of the Information Society," in Michael L. Dertouzos and Joel Moses, eds., *The Computer Age: A Twenty-Year View* (Cambridge: MIT Press, 1979), p.171.

tion of statistics. At the root of the politics of statistical information are the limits of technical knowledge, which cannot resolve large questions about the organization of data. Even the identification of information needs and design of instruments require some conception of social and economic relations and often reflect theoretical schemes from the social sciences. Yet the theories have no official status. At least in the liberal democracies, the public and its officials typically subscribe to a radical empiricism that presumes that statistical inquiry can be theoretically as well as ideologically innocent. These expectations mean that professionals must translate political purposes, cultural presuppositions, and formal social science theories into statistical procedures and data while only seeming to apply their technical skills. Indeed, to avoid cognitive dissonance, they may convince themselves that technical skills are all they are exercising. But as each of the following areas illustrate, the structuring of information allows room for discretionary choice and, therefore, necessarily receives direction from broader social and political values and frames of reference.

The Framing of Inquiry

In the phases of design, fundamental decisions need to be made about the focus, priorities, language, and ultimate objectives of statistical inquiries. To ask some questions is to sacrifice others. The boundaries of official inquiry are the statistical counterpart to the boundaries of the political agenda; and it is an elementary point of political analysis that the control of such boundaries is a critical face of power. Just as statistical blackouts testify to deeper processes at work in a society, so do the patterns of statistical blind spots—that is, the anomalous lacunae in official facts. To make an official count of some phenomenon is often to confer recognition that the phenomenon is real and to risk that its measurement will embarrass those in authority. But omissions may stem from many other possible reasons, including cost-benefit judgments that the additional information is simply not worth the expense, interest group opposition, and general principles for limiting the government's cognitive interest. Even democratic societies decide that some subjects are too sensitive or volatile for political discussion—or for official statistics.⁸²

Religion is such a topic in the United States. Neither the census nor any federal surveys ask about religious affiliation. In 1957, when the Census Bureau last included an item about religion in a survey, it was

⁸²Stephen Holmes, "Gag Rules or the Politics of Omission," in Jan Elster, ed., *Constitutionalism and Democracy* (forthcoming).

forced to bury the data and abandon plans for a religious question on the next decennial census. Some groups, such as Jews and Christian Scientists, objected to the consequences that they anticipated of officially demarcating and inquiring into that domain.⁸³ So far as official sources go, statistical Americans have no religion.

A fundamental question in the framing of inquiry is the degree of linkage between theory and data. Data cannot be gathered in a conceptual vacuum, but not all data are conceived with a theoretical design that organizes categories and hypothesizes relations among them. Morgenstern distinguishes between data and observations on the grounds that observations are guided by theory. "*Observations* are deliberately *designed*; other *data* are merely *obtained*."⁸⁴ Between the earliest tax and foreign trade statistics, which were mere by-products of administration, and modern systems of economic indicators there is a considerable gulf. The twentieth-century forms illustrate Bell's argument about the increasing centrality of theoretical knowledge.⁸⁵ Just as technology and science long proceeded on separate paths of development and only in the last century became closely connected, so large-scale social statistics—a kind of social technology—have only in the last century become closely linked to theories in the social sciences.

The development of the American national income accounts, as Mark Perlman shows in chapter 3, exemplifies the simultaneous importance of political purposes and formal theory in the modern design of statistical systems. In that case, the decision to emphasize economic stabilization policy over long-term growth or distributional questions and the influence of Keynesian theory were critical in framing the system, particularly the decision to treat all government expenditures as consumption and none as investment. In other societies where public investment is critical and the state assumes an active and openly acknowledged role in economic development, the national accounts typically treat state expenditures differently. The American system yields information relevant to the management of demand, but it obscures the role of government in the development of the nation's capital stock. For

⁸³Charles R. Foster, "A Question of Religion," Inter-University Case Program No. 66 (Indianapolis: Bobbs-Merrill, 1961).

⁸⁴Morgenstern, *On the Accuracy of Economic Observations*, p. 88.

⁸⁵Daniel Bell, *The Coming of Post-Industrial Society* (New York: Basic Books, 1973). For an argument that the lack of a persuasive theory diminishes the value of social indicators as a guide to policy, see Aaron Wildavsky, *Speaking Truth to Power: The Art and Craft of Policy Analysis* (Boston: Little, Brown, 1979), pp. 26–40. On social indicators, see also Raymond A. Bauer, ed., *Social Indicators* (Cambridge, Mass.: MIT Press, 1966); Daniel Bell, "The Idea of a Social Report," *The Public Interest*, 15 (1969):72–97; Judith Innes de Neufville, *Social Indicators and Public Policy* (New York: Elsevier, 1975); and a special issue of *Items*, bulletin of the Social Science Research Council, vol. 37, no. 4 (December 1983).

example, between 1929 and 1948 the American accounts show an increase in real private output of 57 percent but an increase in the private nonresidential capital stock of only 1 percent. As Robert Gordon points out, this economic miracle is a statistical mirage. The accounts ignore or underrepresent the huge federal investments during World War II in government-owned but privately operated factories in such industries as steel, aluminum, and aircraft.⁸⁶

At issue in the design of national accounts are fundamental questions of policy, not just of fact. In the early debate over the accounts, Simon Kuznets repeatedly emphasized the practical impossibility of measuring national product without making philosophical choices about the end-purpose of economic activity. National income estimators, he wrote, might "find it comforting to cling closely to the raw data yielded by the economy," but the results would have no relation to economic concepts and therefore would be meaningless. Useful data inevitably required "considerable adjustment and purification," and in the process the estimators had no choice but to make explicit philosophical choices.⁸⁷

Systems of Classification

By classification⁸⁸ I mean "the ordering or arrangement of objects into groups or sets on the basis of their relationships."⁸⁹ At issue here is the choice of categories in the design and analysis of statistics.

Classification is sometimes opposed to quantification as an alternative or lesser form of understanding.⁹⁰ But there is no counting without categories, and, as Cohen and Nagel write, classifying "really involves, or is a part of, the formation of hypotheses as to the nature of things."⁹¹ However, social classification—that is, the classification of people, their activities, and their attributes—differs from other kinds (say, the classifications of plants) because people typically have their own con-

⁸⁶Robert Gordon, "\$45 Billion of U.S. Private Investment Has Been Misplaced," *American Economic Review* 59 (1969):221–38.

⁸⁷Simon Kuznets, *National Product in Wartime* (New York: National Bureau of Economic Research, 1944), p. 3; Kuznets, "Government Product and National Income," in Erik Lundberg, ed., *Income and Wealth*, ser. 1 (Cambridge, Mass.: Bowes & Bowes, 1951), p. 180.

⁸⁸In this section I draw from an unpublished manuscript of mine on social classification.

⁸⁹Robert R. Sokal, "Classification: Purposes, Principles, Progress, Prospects," *Science* 185 (1974):115–23.

⁹⁰See, for example, Cohen, *A Calculating People*, p. 46.

⁹¹Morris R. Cohen and Ernest Nagel, *An Introduction to Logic and Scientific Method* (New York: Harcourt Brace, 1934), p. 223, cited in Duncan, *Notes on Social Measurement*, p. 137.

ceptions of membership. Whether the state accepts those conceptions or imposes others may depend on cultural and class divisions, the form of government, and the ability of groups to get their self-definitions recognized as official.

The process of social classification can be broken down analytically into a series of decisions: (1) the definition of a domain of classification; (2) the grouping of elements into sets; (3) labeling of the groups; and (4) the articulation or arrangement of categories in the classificatory order (for example, rank in a hierarchy).

1. *Domain definition.* Domains of social classification do not simply exist. They are historically constituted. To classify by occupation makes sense only when the division of labor is sufficiently advanced. In the congressional debate over the first U.S. Census in 1790, Madison proposed to include an item about occupation. Others, however, doubted that their constituents could report a specific occupation. A congressman from New Hampshire was "confident the distinction . . . could not be performed."⁹²

Although our official statistics now classify populations by ethnic group, ethnicity is not a self-evident domain. Alternative, related, or overlapping conceptions, such as race, nationality, ancestry, caste, and religion, compete for recognition. Even where a particular grouping may be clear, its domain may not be. Jews have been variously classified as an ethnicity, a race, or a religion. The choice matters. Furthermore, to classify by ethnicity only makes sense if people understand themselves as having one, and even now it is not clear that all Americans do. As Petersen reports in chapter 5, citing NORC data, some 10 to 15 percent of white Americans give no ethnic identity; another 35 to 40 percent cite two or more ethnic strains, and of these, 11 to 12 percent cannot choose between them. If a classificatory system simply puts individuals in classes (without allowing for different kinds of membership in classes), it may impute more structure to the domain than actually exists. In official social classification, domains are, therefore, doubly constituted: first, in social life; and, second, in the formal classificatory systems—the state's mapping of society.

2. *Grouping.* At stake in the groupings established by official statistics is not only the bounding of an analytical category but often the demarcation of political alliances and coalitions, social movements, and interest groups, which may seek official recognition of their common identity. However, official categories of groups may also put together people who have never thought of themselves as being "in the same category." Nonetheless, by virtue of a common administrative and statistical status, their interests may be joined. In this way, official

⁹²Cohen, *A Calculating People*, p. 160.

classification may not merely register but redraw the lines of social differentiation.

Racial and ethnic groupings provide clear examples of such changes, such as the recent statistical amalgamation into the category Hispanic of groups as different as Cuban Americans, Puerto Ricans, and Mexican Americans. This consolidation both reflected a political mobilization and advanced it.

Geographical groupings, such as the boundaries of metropolitan statistical areas (MSAs), also are subject to the same kinds of pressure. In 1983, for example, the Federal Committee on Metropolitan Statistical Areas revised the criteria for designation as an MSA. Some cities that had been joined were separated; others that were separated were joined. But the criteria were not entirely technical. Since the MSA designations are used for economic calculations about advertising and other markets, a merged area may appear to be a more attractive market for business. On the other hand, smaller cities in metropolitan areas often believe they are overshadowed by their bigger neighbor. Norfolk and Newport News, Virginia, wanted a marriage to become the biggest MSA between Washington and Alabama, while Fort Worth got divorced from Dallas, and Oakland from San Francisco.⁹³

3. *Labeling.* Different names often indicate different groupings, but even when referring to the same group, two names may suggest entirely different attributes. Labeling theory, developed in the sociology of deviance, emphasizes that the social response to a form of behavior without a label may be quite different from the response to the labeled phenomenon.⁹⁴ To count "homelessness" rather than "vagrancy" is the statistical counterpart to transforming deviants into victims. Although from a formal taxonomic standpoint a name is just one of many properties of a category, naming is the point of departure for classification—the trigger for the damages and advantages that categories bring.

A special problem that arises in statistics is the lack of consistency between technical and everyday language. Statistics are sometimes deceptive because operational definitions do not correspond to common understanding. For example, in 1970 over 30 percent of the nation's rural population lived in metropolitan areas; over 40 percent of the non-metropolitan population was classified as urban; and 90 percent of the land in metropolitan areas was classified as rural!⁹⁵

⁹³John Herbers, "Big City Ringed by Suburbs Giving Way to Sprawl of Small Metropolitan Areas," *The New York Times*, July 8, 1983.

⁹⁴See, for example, Howard S. Becker, *Outsiders* (New York: Free Press, 1963), and John I. Kitsuse and Aaron Cicourel, "A Note on the Uses of Official Statistics," *Social Problems* 2 (1963):135-39.

⁹⁵I owe this example to William Alonso.

4. *Ordering.* The problem of order in classifications arises because social life is not only complex but messy. Boundaries between sets are fuzzy, and the sets overlap but not necessarily to the same degree in all regions of a domain. Occupational classification illustrates these problems. Some occupational roles are reasonably well-defined because of what may be called the primary processes of classification that take place in education and the economy. Systems of credentialing, professional qualification, and collective bargaining help to demarcate some occupations by generating job titles, occupational definitions, and barriers to entry. These primary classification processes constitute a subject for sociological analysis in their own right. But in addition, there is a set of secondary processes in which official agencies attempt to get from this partial structuring of occupations to a total, systematic mapping of occupational roles.

At this secondary level, several notable problems arise: (i) Reconciliation of inconsistencies: The job classifications in one firm or city may not match those in another; or they may change from one period to another; or what is worse, the names may not change but the occupational roles do, as when a skilled occupation in one census becomes unskilled by the next; (ii) Structuring of ill-defined regions: Just as people may vary in the degree of ethnic identity, so do they vary in attachment to occupational roles—hence the problem of classifying when the subject does not have an occupational self-definition; (iii) The elaboration of hierarchy—in two senses: first, defining what goes under what (for example, defining the major occupational divisions); and second, rank-ordering individual occupations and the occupational divisions. The primary processes of classification yield hierarchies within firms and among professional occupations but generally do not do so for the occupational domain as a whole. That ordering or arrangement requires the imposition of some conceptual framework by the observing state on a partially structured domain of social reality. The U.S. Census Bureau, as Margo Conk has shown, has used several such frameworks and thereby has shaped the measurement and understanding of social mobility and social structure in America.⁹⁶

Measurement and Weighting

The social phenomena measured by official statistics are often historically unique. Of course, every physical measurement is a discrete event, but not in "historical time." It makes little difference whether

⁹⁶Margo Anderson Conk, *The United States Census and the New Jersey Urban Occupational Structure, 1870–1940* (Madison, Wisc.: UMI Research Press, 1980).

the distance to Jupiter is calculated before or after the next presidential election. Most measurements in the physical sciences can be repeated; so can many measurements in the social sciences needed for evaluating the effects of treatments, procedures, or agents. However, the descriptive statistics that primarily concern us here—the taking of censuses and monitoring of the economy—cannot usually be replicated (though comparisons with independent data and other checks on reliability are sometimes available). The inability to replicate is one reason why their official character is so important. In the social and physical sciences, replicability is the basis for the authority of a finding. For descriptive statistics, official status is a functionally equivalent means of legitimation.

Another feature of much social and economic measurement distinguishes it from measurement of natural phenomena. In nature there are no numbers. Observers have had to create them.⁹⁷ The measurement of temperature required a leap of human imagination, but it was not thereafter confused by any scales that the gyrating molecules themselves used. Society, on the other hand, generates its own numerical data before the state comes to count. Just as social classification is complicated by conflicts between subjects' self-conceptions and the categories of official statistics, so problems may arise from the mixing of different systems of measurement—those of subjects and those of observers.

For this reason, it is difficult to make any sharp distinction between primitive and processed social data. Much raw data entered into official statistics have already been privately processed, though not necessarily according to the definitions used in official statistics. I have already mentioned some implications for official statistics of creative accounting and other kinds of strategic data reporting. One problem in official measurement, which arises directly because of its official character, is that the state is handicapped in measuring phenomena some or all of which people want to hide from the state. The state cannot easily determine the level of untaxed income, illegal migration, narcotics traffic, or unreported crime. The "dark figure of crime" has long been the bane of crime statistics (along with the "gray figure" of crime reported to the police but disregarded by them or resolved through informal means and therefore kept out of official records).⁹⁸ Society's "dark

⁹⁷Morgenstern, *On the Accuracy of Economic Observations*, p. 123.

⁹⁸Albert D. Bideman and Albert J. Reiss, Jr., "On Exploring the 'Dark Figure' of Crime," *Annals of the American Academy of Political and Social Science* 374 (1967): 1-15; N. H. Avison, "Criminal Statistics as Social Indicators," in Andrew Shonfield and Stella Shaw, eds., *Social Indicators and Social Policy* (London: Heinemann, 1972), pp. 33-52.

side" is not only difficult technically to estimate; it is sometimes politically impossible to acknowledge. Some regimes, such as those in the Communist world, maintain that problems like unemployment or crime to be found in decadent societies simply do not exist in theirs, at least not in significant degree. The Latin American governments that deny that their countries are major sources of cocaine or marijuana are unlikely to publish estimates of earnings from illegal drugs in their foreign trade statistics.

Many of the enduring political conflicts over statistics are conflicts over the rules of measurement. The classic dispute about the national income accounts concerns the practice of not attributing any economic value to nonmarket services, such as those traditionally provided by women within the family. This is offensive to feminists. Cost-benefit analysis typically measures the value of human life by future earnings; this is offensive to groups representing the elderly. Indeed, the application of cost-benefit analysis to medical care for the aged has rather severe political and ethical limitations.⁹⁹ In the determination of the poverty rate, conservatives favor the inclusion of in-kind income, which would bring down the absolute rate by raising the measured income of the poor. On the other hand, advocates of the poor want the income cut-off for poverty raised because the original basis for its computation no longer exists. The index assumes that the poor spend one-third of their income on food; the cut-off is determined, therefore, by multiplying a subsistence food budget by three. However, critics argue that since the poor now spend less than a third of their income on food, the multiple should be higher than three.

In these disputes, the forces arrayed on different sides want their values embodied in the numbers because the numbers influence perceptions of group worth—what women contribute to the economy; what value is to be put on the elderly, and what it is worth spending on them; how many are the poor, and what priority they deserve. To adopt a rule of measurement in these cases is plainly a political choice of great symbolic and practical consequence.

That the political conflicts in these cases concern the underlying rules is a critical point. Principles are at issue. Even those who criticize the official figures generally do not suggest that politics enters into particular calculations. The case is somewhat different with the politics of economic and budget forecasting. Perhaps no statistical results are more sensitive to political considerations than are projections and forecasts, for these may be self-fulfilling. A high forecast of economic growth may

⁹⁹Jerry Avorn, "Benefit and Cost Analysis in Geriatric Care: Turning Age Discrimination into Health Policy," *New England Journal of Medicine* 310 (May 17, 1984): 1294-1307.

encourage capital spending, whereas a low forecast may crimp investment. A high growth forecast may also bring with it higher projections of government revenues and therefore encourage more government spending; a low forecast may raise projected deficits and thereby disarm advocates of bigger government programs. Projecting "revenue low and expenditure high" is a predictable budget-balancing strategy of ministries of finance, particularly in countries facing severe fiscal problems.¹⁰⁰

The peculiar problem of official forecasts is that they serve not only to predict future states but also to proclaim present intentions. An administration that intends to "stay the course" is not likely to tolerate forecasts by its own chief economist indicating that current policy will lead to slow growth and high deficits. So it was that Martin Feldstein had to leave his post as chairman of the Council of Economic Advisors in the Reagan administration—and so it was that President Reagan nearly abolished the council. Forecasting may well be a kind of statistical undertaking for which official agencies are structurally disabled.

The Periodicity of Inquiry and Adaptation to Change

Statistical systems have several different kinds of periodicity. Data are gathered and reported at varying intervals; and the questions, categories, and other instruments may be tested and reexamined at other, longer intervals. In the United States, the federal government publishes weekly data on the money supply, monthly data on unemployment, quarterly data on GNP, annual estimates for poverty, and the decennial census of the nation's population. These varying frequencies are almost as much a part of the political system as the election of congressmen every two years, presidents every four, and senators every six.

But obviously different considerations are involved. The frequency of data collection and publication seems to reflect an implicit judgment about the rate of change of the phenomena being measured and the value of up-to-date information. Presumably, slow-moving variables do not require the same frequency of reporting as do those that fluctuate rapidly. This may be the reason that the relatively stable social indicators, such as birth or divorce rates, command less frequent press attention than the more volatile economic indicators. Indeed, the attention given social and economic indicators seems to depend largely on whether and how much they move, or to be more precise, on change in

¹⁰⁰Wildavsky, *Budgeting: A Comparative Theory of Budgetary Processes*, p. 143.

the rate of change. When the infant mortality rate stopped falling in the early 1980s as rapidly as it had before, that was news.

Statistical information may decline in accuracy not only because measurements get out of date but because the classifications or other underlying principles of cognitive organization lose their validity. For example, changes in the structure of the economy inevitably create new categories of industry and employment. The most rapidly growing industry in New York State at one point was "other." Although statistical systems need continually to be adjusted to take account of such changes, they have powerful inertial forces at work. The more categories and questions are revised, the less comparable are data for different periods. Structural revisions are also costly to undertake. Hence there are strong conservative tendencies that may lead to a lag in the recognition of structural change.

The history of the consumer price index (CPI) illustrates the conservative character of official statistics. The "market basket" of commodities whose prices are included lags behind purchasing patterns. Old product models hang on. Typically new products have been introduced into the index only long after they have been on the market and have already undergone large price declines. Gordon notes:

The United States became a motorized society in the 1920's and 1930's, when there was an enormous improvement in the performance of automobiles along with a decline in their price—but the automobile was not included in the CPI until 1940. Penicillin entered the CPI in 1951, after it had already experienced a 99 percent decline from its initial price. The pocket calculator entered the CPI in 1978, after it had declined in price about 90 percent from the early 1970-71 models and about 98 percent from the price of a comparable electromechanical desk calculator of the 1960's.¹⁰¹

In this particular case, a built-in lag in recognizing change lends an upward bias to the measure of inflation, but there is no definite political pattern to the effects. Statistical systems are conservative in an institutional rather than political sense.

The Presentation of Data in Bureaucratic Life

Neutrality does not fully express the bureaucratic ideal in the presentation of statistical data. It is more like relevance without parti-

¹⁰¹Robert J. Gordon, "The Consumer Price Index: Measuring Inflation and Causing It," *The Public Interest* 63 (Spring 1981), p. 130. See also Richard W. Wahl, "Is the Consumer Price Index a Fair Measure of Inflation?" *Journal of Policy Analysis and Management* 1 (1982):496-511.

sanship.¹⁰² However, the very fear of appearing partisan, ideological, or sectarian promotes abstention from judgments that express shock or surprise (particularly about the performance of administrations in power!). Nonetheless, official agencies in some societies do quietly produce data that reflect unfavorably on their governments. Even more remarkable is the kind of case that Christopher Jencks discusses in this volume. In reporting changes in real income, federal agencies probably made the performance of the U.S. government and economy in the 1970s seem worse than they actually were. Here again institutional conservatism may chiefly be at work. The methods of reporting did not change; social and economic relations did—but to acknowledge and assimilate those changes in revised statistics might raise more opposition than it would dispel.

The acknowledgment of ambiguity and imprecision in the presentation of data poses a task of considerable delicacy. The appropriate disclaimers may be made in technical appendices, while the basic mode of presentation implicitly says the opposite. In a pattern that Morgenstern calls "specious accuracy," figures are regularly reported to several decimal places even though they cannot possibly be accurate to that degree.¹⁰³

Conceptual ambiguities often suggest the need for more than one indicator, but for political reasons this is rarely done. The U.S. Treasury does produce a series of different numbers for the money supply, each reflecting a different conception. But several other proposals for multiple-number indicators have been rejected. In the debate over the national income accounts in the 1940s, Kuznets argued that rather than producing a single figure for gross national product, the Commerce Department should produce a group of different figures based on varying definitions.¹⁰⁴ Similarly, Eisner has recently suggested that rather than a single number for the federal deficit, the government could justifiably produce a dozen, each with different assumptions and useful for different purposes.¹⁰⁵ However, in the late 1960s, when three different budget figures were in use, the accounting system was revised to yield

¹⁰²Martin, "Statistical Practice in Bureaucracies."

¹⁰³Morgenstern, *On the Accuracy of Economic Observations*, p. 62. Making the same point in another domain of statistics, Tufte writes: "The study of politics, like the study of economics, is usually a one-digit science at best; in fact, we do well to get the sign right more than half the time. How then can anyone be asked to take the third, fourth, and fifth significant digits seriously?" Edward R. Tufte, "Political Statistics for the United States: Observations on Some Major Data Sources," *American Political Science Review* 71 (1977):312.

¹⁰⁴Simon Kuznets, "National Income: A New Version," *Review of Economics and Statistics* 30 (August 1948), pp. 151-79.

¹⁰⁵Robert J. Eisner, "Which Budget Deficit: Some Issues of Measurement and Their Implications," *American Economic Association Papers and Proceedings* 74 (May 1984): 138-43.

ISBN:

a single figure for a budget surplus or deficit. The presidential commission that recommended the change claimed that the use of three different numbers had been politically confusing and led to public cynicism about their manipulation.¹⁰⁶ A single number, after all, is the ultimate step in the reduction of complexity that official statistics bring about. If the statistical agencies do not perform that reduction, others will when they translate the data into one-page briefings for policymakers and newspaper headlines for the public.

IV. Uses and Effects: Do Statistics Count?

The most common metaphors for statistical systems suggest that they passively record and measure social and economic conditions. They are typically called barometers or mirrors, and statistical tables or graphs are described as pictures or photographs. Like photographs, statistics seem to arrest the flow of human activity and fix it for more detached inspection. Numbers seem superior in objective reality to "mere" words for the same reason Susan Sontag cites in suggesting why photography, in contrast to painting, so strongly compels belief: A number, like a photograph, seems a piece of reality, rather than an interpretation of it.¹⁰⁷ However, statistics not only lend themselves to many interpretations; they contain them. And because statistics do not simply reproduce reality, statistical systems represent an independent factor in social life.

Yet to say that statistics count is not to identify (much less measure!) their effects. The effects of information or communication are notoriously difficult to specify. Much research has evaluated the effects of mass communications—radio campaigns, advertising, and violence on television are each the subject of an entire corpus of sociological work¹⁰⁸—but nothing comparable is available on official statistics. Indeed, the effects are so diffuse and elusive that valid generalizations may be few.

I have already alluded to many uses or functions of official statistics. But use never proves effect. For example, instead of information causing a decision, a decision made for other reasons may cause the in-

¹⁰⁶U.S. President's Commission on Budget Concepts, *Report* (Washington, D.C.: G.P.O., 1967).

¹⁰⁷Susan Sontag, *On Photography* (New York: Farrar, Strauss & Giroux, 1977), p. 4.

¹⁰⁸For a review, see Todd Gitlin, "Media Sociology: The Dominant Paradigm," *Theory and Society* 6 (1978):205-52.

formation to be cited. Statistics, as Keyfitz says in chapter 6, are the rhetoric of the age.

While keeping that caution in mind, I shall try to identify a few general effects of official statistical systems. My main concern here is the possible impact on politics and social structure in contemporary society.

Official Statistics as Cognitive Commitments

Although critics often object to the federal government's methods for determining unemployment, inflation, and economic growth, the official figures provide the common point of reference in assessing the condition of the economy and the performance of administrations in office. The official definitions are not the only ones possible; alternatives may be found in academic papers and sometimes in the financial press. But the meanings shared socially in the widest sense are the concepts operationalized in the government's statistical series.

Official statistics thereby become cognitive commitments for a society. We have, in effect, bound ourselves collectively to think of the social phenomenon of unemployment—its magnitude, trends, distribution—in the way that the statistical agencies and commissions have settled upon. The structure of rules (classifications, methods of measurement and weighting) is the cognitive equivalent of a constitution. Just as a constitution binds a polity to rules for elections (a kind of numerical procedure), so the structure of statistics binds it to procedures for resolving potentially divisive questions of fact (how many are unemployed or poor, or whether real income is rising or falling).

The classifications used in official statistics are cognitive commitments of a powerful kind. Once governments decide to use particular categories to count, the terms enter the language of administration and shape both private and governmental decisions. Official categories may help to constitute or divide groups and to illuminate or obscure their problems and achievements. Once the Census Bureau adopted the category Hispanic, American society became cognitively committed to it. In France the use of the category "cadres" in official statistics helped to crystallize the class identity of those in middle-level technical and managerial posts.¹⁰⁹ The groupings for social insurance in Germany, particularly the split between *Arbeiter* and *Angestellten* (wage-workers

¹⁰⁹Luc Boltanski, "Taxinomies sociales et luttes de classes: La mobilisation de 'la classe moyenne' et l'invention des 'cadres,'" *Actes de la recherche en sciences sociales* 29 (September 1979):75–103.

and salaried employees), are said to have helped to shape class consciousness.¹¹⁰

Official statistics count even if the methods are faulty and the data incorrect. The axiom of modern computer research—garbage in, garbage out—does not exactly apply when statistics are official. In that case the rule may be *garbage in, consensus out*.

Statistics and the Emergence of Norms

If official statistics affect social perception and cognition, so they also powerfully affect social norms. An average is not just a number; it often becomes a standard. In many contexts, to be average is to be okay. Below an average may lie evidence of failure and possibly presumptions of need, whereas above it may lie evidence of success and claims of merit.

Social norms for public policy tend to keep pace with statistical measures of actual conditions. De Neufville notes that the number of children per classroom influences norms of class size, and the norm varies from one country to another according to the measured ratios.¹¹¹ In the United States a 2 percent inflation rate and a 3 or 4 percent unemployment rate were considered normal during the 1950s and 1960s. As measured inflation and unemployment rose in the 1970s, the norms also inched up. By the mid-1980s, normal inflation seems to be about 4 percent, and "full employment" is an unemployment rate of as much as 6 or 7 percent.

Many regularly reported social and economic indicators have instantly recognizable normative content. The numbers do not provide strictly factual information. Since the frameworks of normative judgment are so widely shared, the numbers are tantamount to a verdict. Combining the cognitive commitments of official statistics with shared frameworks of judgment effectively binds our politics to a court in which the statistical agencies pass on the performance of national leaders. And as Kenneth Prewitt points out in these pages, voters seem to base their judgments more on the performance of the national economy than on their own personal experience. Since the statistics are the basis for those readings, their influence on elections may sometimes be critical.

¹¹⁰Jürgen Kocka, "Class Formation, Interest Articulation, and Public Policy: The Origins of the German White-Collar Class in the Late Nineteenth and Early Twentieth Centuries," in Suzanne D. Berger, ed., *Organizing Interests in Western Europe* (New York: Cambridge University Press, 1981), pp. 63–82.

¹¹¹De Neufville, *Social Indicators and Public Policy*, p. 4.

Statistical Systems as "Automatic Pilots"

Statistics and statistical formulas have been adopted in a variety of contexts as a device for routinizing decisions. Many of these uses are comparatively recent. Cost of living adjustments (COLAs), typically based on the CPI, first became common in labor contracts in the 1950s and 1960s. In 1972 Congress voted to index Social Security benefits to protect them against inflation, and in 1981 it indexed federal income tax brackets to prevent "bracket creep." In the 1970s the federal government increasingly began to distribute aid to state and local governments according to statistical formulas. And under the Gramm-Rudman plan enacted in 1985, Congress voted to bring down the federal deficit over five years through staged reductions to be made by formula if Congress and the President in any year failed to agree on sufficient spending cuts or tax increases.

In each of these instances, decision makers have used statistical devices to limit the boundaries of discretion. The reasons for the rise of COLAs in collective bargaining may help to identify the general process at work. Sanford M. Jacoby points out that COLAs facilitate contracts of longer duration and, therefore, tend to reduce the "reopening costs" of new negotiations and the risk of strikes. However, before 1950 both unions and management generally opposed COLAs for fear that workers might strike if wages were automatically cut as a result of a fall in prices; employers also did not like guaranteeing wage increases if prices rose. Two principal factors seem to account for the growing use of COLAs in the postwar era: (1) the change in inflationary expectations, which meant that automatic pay cuts were unlikely; and (2) the growing complexity of collective bargaining agreements, which made them more difficult and expensive to renegotiate. The rising cost of contract reopenings led management to accept automatic pay formulas to secure longer and more stable agreements.¹¹²

The use of automatic formulas for distributing federal aid may reflect similar changes in transaction costs. Just as labor contracts became more complex, so did federal programs. Formulas reduce the need for legislative reopenings and administrative evaluation of specific programs, both of which demand time and potentially increase conflict. The indexing of Social Security may have been directly influenced by the example of COLAs in labor contracts. Just as changed inflationary expectations meant that employees need not fear COLA-induced pay cuts, so, too, Social Security beneficiaries saw a prospect only of upward

¹¹²Sanford M. Jacoby, "Cost-of-Living Escalators Became Prevalent in the 1950's," *Monthly Labor Review* (May 1985):32-33.

adjustments. But in this case, a miscalculation also played a role. The proposal to index Social Security came from Republicans, who erroneously believed it would limit future growth in benefits.¹¹³ In fact, the initial procedure for indexing overcompensated for inflation, and because of the unexpected rise in inflation in the 1970s, the real value of benefits jumped substantially.

As a result of these institutionalized uses in private contracts and public programs, official statistics now affect the distribution of income and other resources. The distributive effects result from both biases in the indexes and variations in their application. If all sources of income and all tax provisions were indexed by one ideal measure of inflation, that measure would have no effect (except presumably to reduce concern about inflation). However, only some sources of income and a few tax provisions are now indexed, and the indexes are far from perfect. Robert Gordon observes that the use of escalator clauses based on the consumer price index has created "a two-class society, separating those who are protected against inflation, legally or by contract, from those who are not."¹¹⁴ The "class" whose interests are linked to the CPI includes 8 million workers covered by collective bargaining contracts with cost of living adjustments; 31 million Social Security beneficiaries; 2.5 million retired military and federal Civil Services employees and survivors; 20 million food stamp recipients; and 25 million children receiving subsidized school lunches. (The latter two groups' benefits depend not on the CPI as a whole but on one of its components.) Counting dependents, about half the population of the United States is directly affected by the way the CPI measures inflation. The incomes of that class grew at the expense of the unprotected in the late 1970s, when the CPI significantly overstated inflation because of its peculiar treatment of housing costs.

The CPI is an especially clear example of how statistical systems matter. Even though it was widely known that the CPI misrepresented the inflation rate, real political consequences were felt because of the index's behavior. Not only did it redistribute income; it helped to raise inflation and panic the Carter administration into its ill-fated credit controls.

Yet there is another side to this issue. A statistical rule is a device for making a decision impersonal, or at least making it appear to be impersonal. In this regard, statistics represent resources for politics, not only in providing information but in providing a means for reducing the

¹¹³Paul Light, *Artful Work: The Politics of Social Security Reform* (New York: Random House, 1985), p. 45.

¹¹⁴Gordon, "The Consumer Price Index," p. 114.

fear of unchecked power. To be sure, a formula for distributing federal aid may have been designed to benefit the district of an influential congressman. But once the indicators and the formula are established, they resist modification. To subordinate ourselves under an impersonal rule is the fundamental reason why we have laws and constitutions. However imperfect, a rule of law tends to restrain the abuse of power and thereby enlarges liberty. Statistical systems help to accomplish similar purposes, and, despite their imperfections, they may also contribute to our freedom.

A Concluding Note

At the outset I suggested that statistical systems deserved attention as social phenomena in their own right, not just for the practical value of determining whether statistics are distorted by social processes. But, of course, a more thorough understanding of the social and cognitive organization of official statistics may give rise to better ideas about how to produce them—or, for that matter, when to ignore them. Joan Robinson once said that the reason to learn economics is to avoid being deceived by economists. The rationale for sociological inquiry into statistics is partly to avoid being deceived by official statistics. Studies of the development and organization of statistical systems are a journey upstream toward the sources of everyday facts. In that sense, they serve purposes fundamental to sociology and help illuminate a sphere of knowledge that has taken on central importance in our political and economic life. In a small way, this volume may contribute to those larger goals.