INDUSTRIAL RELATIONS SYSTEMS

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AN INDUSTRIAL RELATIONS SYSTEM

There are marked differences in industrial relations among enterprises, industries, and countries. While each work place is to a degree unique, there are groups of situations with common industrial-relations features. A participant—whether manager, worker, representative of workers, neutral, or government agent—moving from one place to another will recognize familiar arrangements; other moves will reveal strange surroundings. Practical experience in the United States would identify a distinctive pattern of industrial relations within the railroad industry, the maritime field, basic steel, a construction site, the plants of General Motors, the newspaper offices in metropolitan New York City, the Bank of America in California, or the offices of federal government departments. Each of these cases constitutes a system of industrial relations. For some purposes these illustrations may be broken down into smaller and more distinctive systems and for other purposes they may be integrated into still larger systems. Those with industrial relations experience identify and distinguish among systems on the basis of rules of thumb developed out of experience.

Practitioners recognize that within a single industrial-relations system there are common problems, distinctive from those posed in other systems; there also tend to be distinctive solutions. A system has a certain unity; changes in one part of a system affect other parts of that system more directly than they affect other systems. The participants are more attuned to developments within the system than without; they share a common work place language, distinctive common beliefs and prejudices. The perceptions of the sensitive practitioner are no substitute for systematic analysis, but they are a suggestive starting point.

The literature on industrial relations has recently begun to make explicit use of the term "system," particularly to describe features characteristic of one country and distinguished from others.[1] Two studies are illustrative: *The System of Industrial Relations in Great Britain*[2] and "The American System of Industrial Relations."[3] "System" in these writings does not mean a planned order. ". . . We have chosen to deal

with so vital a matter as the relations between employers and employed in an extremely involved and haphazard fashion. This is, after all, an age of planning. Yet in no part of our economic life is planning so strongly opposed by all classes in the community."[4] "The ardent advocates of economic planning may be shocked by the haphazard consequences of our voluntary system; they see power overriding equity, tradition barring the way to rational change, and muddled compromise being preferred to ordered consistency."[5]

> Perhaps it is wrong to designate as a "system" a group of arrangements that has grown up without being planned as a whole. . . . Our arrangements in the field of industrial relations may be regarded as a system in the sense that each of them more or less intimately affects each of the others so that they constitute a group of arrangements for dealing with certain matters and are collectively responsible for certain results.[6]

The present interest in industrial relations systems is to be sharply distinguished from classifications of union-management relationships in the spectrum of labor peace and warfare.[7] These typologies use such terms as open conflict, armed truce, arm's-length bargaining, and full cooperation; in one sense each may be regarded as a different system of relationships between parties. The concern with labor peace or warfare probably has stimulated interest in the larger subject of industrial relations systems, but such classifications have almost no relevance to the present inquiry.

What meaning, then, is to be given to an "industrial relations system"? In what sense is a "system" involved? Can the term be given rigorous and analytical definition, or shall it remain a perceptive phase corresponding to the insights of practical experience? Are there characteristics common to all industrial relations systems? What factors distinguish one industrial relations situation from another? Can the same concept be used to facilitate analysis among sectors within a country and also among countries? These questions are suggestive of the major problem of this chapter: to provide *analytical* meaning to the idea of an industrial relations system.

INDUSTRIAL RELATIONS AND INDUSTRIAL SOCIETY

In primitive and agrarian societies the analog of industrial relations problems arise—such as, who shall perform what work, what standards of discipline shall be applied at the work place, or how shall the fruits of

labor be divided. These issues are typically handled within the extended family, which is closely integrated into the society. In the plantation-slave society the corresponding problems are met by the political institutions that maintain slavery.[8] Thus, industrial relations problems of a general type are not unique to modern industrial society. But industrial society, whatever its political form, creates a distinctive group of workers and managers. The relations among these workers and managers, and their organizations, are formally arranged in the industrial society outside the family and distinct from political institutions, although the family and political institutions may in fact be used to shape or control relations between managers and workers at the industrial work place.[9]

The full range of the complex interactions among groups and persons in a modern industrial society does not admit of ready description or explanation. The social system as a whole is ordinarily regarded as the province of sociology. Economics has carved out from the fullness of social action certain limited facets of behavior. Within the confines of these abstractions, it has developed rigorous theoretical models and analytical propositions relevant to these limited aspects of total social behavior. There is no purely economic behavior but economists have developed significant and useful propositions about the economic aspects of behavior. They have also organized specialized collections of facts, often built around special-purpose concepts and definitions such as national-income accounts or input-output tables. Thus economics has become highly developed as a discipline.

The economic system can be regarded as a subsystem of the more general total social system. Few scholars have explored the interrelations and boundary lines between a general system of social action and economics more comprehensively nor persistently than has Professor Talcott Parsons.[10] While it would be interesting to apply directly the general analytical scheme developed by Professor Parsons and various associates to the industrial relations features of industrial society,[11] such an exercise is not the central interest here. Nonetheless, the analogy of economics, an economic system, and the relations between the economic aspects of behavior and the totality of social action is suggestive for organizing insights and observations about the industrial relations aspects of behavior in industrial society.

1. An industrial relations system is to be viewed as an analytical subsystem of an industrial society on the same logical plane as an economic system, regarded as another analytical subsystem. The industrial relations system is not coterminous with the economic system; in some respects the two overlap and in other respects both have different scopes. The procurement of a work force and the setting of compensation for labor services are common centers of interest. A systematic explanation

of production, however, is within economics but outside the scope of industrial relations. The full range of rule making that governs the work place is outside the scope of an economic system but central to an industrial relations system.

2. An industrial relations system is not a subsidiary part of an economic system but is rather a separate and distinctive subsystem of the society, on the same plane as an economic system. Thus the theoretical tools designed to explain the economic system are not likely to be entirely suitable to another, different analytical subsystem of society.

3. Just as there are relationships and boundary lines between a society and an economy, so also are there between a society and an industrial relations system. All analysis of the economy makes some assumptions, explicitly or implicitly, about the remainder of the social system; so also must an analysis of an industrial relations system make some assumptions about the rest of the social system.

4. An industrial relations system is logically an abstraction, just as an economic system is an abstraction. Neither is concerned with behavior as a whole. There are no actors whose whole activity is confined *solely* to the industrial relations or economic spheres, although some may approach this limit. Neither an economic system nor an industrial relations system is designed simply to describe in factual terms the real world of time and space. Both are abstractions designed to highlight relationships and to focus attention upon critical variables and to formulate propositions for historical inquiry and statistical testing.

5. This view of an industrial relations system permits a distinctive analytical and theoretical subject matter. To date the study of industrial relations has had little theoretical content. At its origins, and frequently at its best, it has been largely historical and descriptive. A number of studies have used the analysis of economics particularly in treating wages and related questions; other studies, particularly of factory departments, have borrowed the apparatus of anthropology and sociology.[12] Although industrial relations aspires to be a discipline, and even though there exist separate professional societies, industrial relations has lacked any central analytical content. It has been a crossroads where a number of disciplines have met—history, economics, government, sociology, psychology, and law. Industrial relations requires a theoretical core in order to relate isolated facts, to point to new types of inquiries, and to make research more additive. The study of industrial relations systems provides a genuine discipline.

6. Three separate analytical problems are to be distinguished in this framework: (a) the relation of the industrial relations system to the society as a whole, (b) the relation of the industrial relations system to the subsystem known as the economic system, and (c) the inner structure

and characteristics of the industrial relations subsystem itself. These questions have not ordinarily been separated in industrial relations discussion, and what is given and what is variable accordingly has not been clearly stated. These issues are quite distinct. The next section considers the structure and characteristics of the industrial relations subsystem of industrial society.

STRUCTURE OF AN INDUSTRIAL RELATIONS SYSTEM

An industrial relations system at any one time in its development is regarded as composed of certain actors, certain contexts, an ideology that binds the industrial relations system together, and a body of rules created to govern the actors at the work place and work community.

The Actors in a System

The actors are: (1) a hierarchy of managers and their representatives in supervision, (2) a hierarchy of workers (nonmanagerial) and any agents, and (3) specialized governmental agencies (and specialized private agencies created by the first two actors) concerned with workers, enterprises, and their relationships. These first two hierarchies are directly related to each other in that the managers have responsibilities at varying levels to issue instructions (to manage), and the workers at each corresponding level have the duty to follow such instructions (to work).

The hierarchy of workers does not necessarily imply formal organizations; they may be said to be "unorganized" in popular usage, but the fact is that wherever they work together for any considerable period, at least an informal organization comes to be formulated among the workers with norms of conduct and attitudes toward the hierarchy of managers. In this sense workers in a continuing enterprise are never unorganized. The formal hierarchy of workers may be organized into several competing or complementary organizations such as works councils, unions, and parties.

The hierarchy of managers need have no relationship to the ownership of the capital assets of the work place; the managers may be public or private or a mixture in varying proportions. In the United States, for instance, consider the diverse character of management organizations in the executive departments of the federal government, local fire departments, the navy yards, the Tennessee Valley Authority, municipal transit operations and local utilities, government-owned and privately operated atomic-energy plants, railroads and public utilities, and other private enterprises. The range of combinations is greater where governments

own varying amounts of shares of an enterprise and where special developmental programs have been adopted. The management hierarchy in some cases may be contained within an extended or a narrow family, and its activities largely explained in terms of the family system of the society.

The specialized government agencies as actors may have functions in some industrial relations systems so broad and decisive as to override the hierarchies of managers and workers on almost all matters. In other industrial relations systems the role of the specialized governmental agencies, at least for many purposes, may be so minor or constricted as to permit consideration of the direct relationships between the two hierarchies without reference to governmental agencies. In still other systems the worker hierarchy or even the managerial hierarchy may be assigned a relatively narrow role. But in every industrial relations system these are the three actors.[13]

The Contexts of a System

The actors in an industrial relations system interact in a setting that involves three sets of givens. These features of the environment of an industrial relations system are determined by the larger society and its other subsystems and are not explained within an industrial relations system. These contexts, however, are decisive in shaping the rules established by the actors in an industrial relations system. The significant aspects of the environment[14] in which the actors interact are: (1) the technological characteristics of the work place and work community, (2) the product and factor markets or budgetary constraints that impinge on the actors, and (3) the locus and distribution of power in the larger society.

The technological features of the work place have very far-reaching consequences for an industrial relations system, influencing the form of management and employee organization, the problems posed for supervision, many of the features of the required labor force, and the potentialities of public regulation. The mere listing of a few different work places reveals something of the range of industrial relations systems within an industrial society and the influence of the technological characteristics: airlines, coal mines, steel mills, press and wire services, beauty parlors, merchant shipping, textile plants, banks, and food chain stores, to mention only a few. The technological characteristics of the work place, including the type of product or service created, go far to determine the size of the work force, its concentration in a narrow area or its diffusion, the duration of employment at one locale, the stability of the same working group, the isolation of the work place from urban

areas, the proximity of work and living quarters, the contact with customers, the essentiality of the product to the health and safety or to the economic development of the community, the handling of money, the accident potential, the skill levels and education required, the proportions of various skills in the work force, and the possibilities of the employment of women and children. These and many other features of the technology of the work place are significant to the type of managerial and worker hierarchies and government agencies that arise. They also pose very different types of problems for the actors and constrain the types of solutions to these problems that may be invented and applied. Significant differences among industrial relations systems are to be attributed to this facet of the environment, and, in turn, identical technological environments in quite different national societies may be regarded as exerting a strong tendency upon the actors (modified by other factors) to create quite similar sets of rules.

The market or budgetary constraints are a second feature of the environmental context that is fundamental to an industrial relations system. These constraints often operate in the first instance directly upon the managerial hierarchy, but they necessarily condition all the actors in a particular system. The context may be a market for the output of the enterprise or a budgetary limitation or some combination of the two. The product market may vary in the degree and character of competition through the full spectrum from pure competition, monopolistic competition and product differentiation, to oligopoly and monopoly. A charitable institution or a nationalized plant is no less confronted by a financial restraint than a private business enterprise and the harshness of the budgetary strictures that confront managements vary among nonmarket units in the same way that degrees of competition vary among market-oriented enterprises. These constraints are no less operative in socialist than in capitalist countries. The relevant market or budgetary constraints may be local, national, or international, depending on the industrial relations system; the balance of payments constitutes the form of the market restraint for nationwide systems.

The product market or budget is a decisive factor in shaping the rules established by an industrial relations system.[15] The history in the past generation of the textile and coal industries around the world is testimony to the formative influence of the market or budgetary influence on the operation of industrial relations systems. The contrasts between industries sheltered or exposed to international competition is another illustration. The interdependence of wage and price fixing in public utilities gives a distinctive characteristic to these systems of industrial relations. The degrees of cost and price freedom in monopolistic industries permeate these industrial relations systems. The market or budgetary

context also indirectly influences the technology and other characteristics of the work place: the scale and size of operations and the seasonal and cyclical fluctuations in demand and employment. An industrial relations system created and administered by its actors is adaptive to its market and budgetary constraints.

The locus and distribution of power[16] in the larger society, of which the particular industrial relations complex is a subsystem, is a third analytical feature of the environmental context. The relative distribution of power among the actors in the larger society tends to a degree to be reflected within the industrial relations system; their prestige, position, and access to the ultimates of authority within the larger society shapes and constrains an industrial relations system. At this juncture the concern is not with the distribution of power *within* the industrial relations system, the relative bargaining powers among the actors, or their controls over the processes of interaction or rule setting. Rather the reference is to the distribution of power outside the industrial relations system, which is given to that system. It is, of course, possible that the distribution of power within the industrial relations system corresponds exactly to that within the contextual society. But that this need not be so is illustrated by numerous instances of conflict between the economic power within an industrial relations system and political power within a society, or by the tendency for an actor to seek to transfer a conflict to the political or economic arena, in which its control over the situation is thought to be relatively greater. The general strike and French and Italian experience for a period after World War II particularly illustrate the point. The dominance of an army group, a traditional and dynastic family elite, a dictator, the church, a colonial administrator, a political party, or public opinion are types of power orientation in the larger society that tend to shape an industrial relations system.

The distribution of power in the larger society does not directly determine the interaction of the actors in the industrial relations system. Rather, it is a context that helps to structure the industrial relations system itself. The function of one of the actors in the industrial relations system, specialized governmental agencies, is likely to be particularly influenced by the distribution of power in the larger society. Industrial relations systems national in scope as different as those in contemporary Spain, Egypt, USSR, Yugoslavia, and Sweden call attention to the distribution of power within the larger society. Industrial relations systems of a lesser scope, such as those at the plant level, are also shaped by the distribution of power within the industrial relations system that is exterior to the plant level. Thus the industrial relations system at a plant level, which is part of a highly centralized industrywide arrangement, is quite different from one which is decentralized to the plant level. The

distribution of power in the society exterior to the industrial relations system is regarded as given to that system and helps to shape its operations.

The full context of an industrial relations system that is given for the three actors consists at a given time in the development of that system of (1) the technological and work-community environment, (2) the product and factor markets or budgetary constraints, and (3) the distribution of power in the contextual society.

The Establishment of Rules

The actors in given contexts establish rules for the work place and the work community, including those governing the contacts among the actors in an industrial relations system. This network or web of rules[17] consists of procedures for establishing rules, the substantive rules, and the procedures for deciding their application to particular situations. The establishment of these procedures and rules—the procedures are themselves rules—is the center of attention in an industrial relations system. Just as the "satisfaction of wants" through the production and exchange of goods and services is the locus of analysis in the economic subsystem of society, so the establishment and administration of these rules is the major concern or output of the industrial relations subsystem of industrial society. In the course of time the rules may be expected to be altered as a consequence of changes in the contexts and in the relative statuses of the actors. In a dynamic society the rules, including their administration, are under frequent review and change.

There is a wide range of procedures possible for the establishment and the administration of the rules. In general terms the following ideal types can be distinguished: The managerial hierarchy may have a relatively free hand uninhibited in any overt way by the other two actors; the specialized governmental agencies may have the dominant role without substantial participation of the managerial or worker hierarchies; The worker hierarchy may even carry the major role in rule fixing; the management and worker hierarchies in some relationships may set the rules together without substantial participation of any specialized governmental agency; finally, the three actors may all play a consequential role in rule setting and administration. The procedures and the authority for the making and the administration of the rules governing the work place and the work community is a critical and central feature of an industrial relations system, distinguishing one system from another.

The actors who set the web of rules interact in the context of an industrial relations system taken as a whole, but some of the rules will

be more closely related to the technical and market or budgetary constraints, while other rules will be more directly related to the distribution of power in the larger society. Thus maritime safety rules are related primarily to the technology of ships, while rules defining the relative rights of officers and crew aboard ship are related primarily to the distribution of power in a larger society. But safety rules are also influenced to a degree by the distribution of power in the full community, and the obligations and rights of officers and crew aboard ship are clearly conditioned to a degree by the technical problems of running a ship. While the context is an interdependent whole, some rules are more dependent upon one feature of this context than others.

A vast universe of substantive rules is established by industrial relations systems apart from procedures governing the establishment and the administration of these rules. In general, this expanse can be charted to include (1) rules governing compensation in all its forms, (2) the duties and performance expected from workers including rules of discipline for failure to achieve these standards, and (3) rules defining the rights and duties of workers, including new or laid-off workers, in particular positions or jobs. The actual content of these rules varies enormously among systems, particularly, as will be shown, as a consequence of the technological and market contexts of the systems.

One of the major problems of this inquiry is to determine the extent to which similar rules are developed in different industrial-relations systems with common technological contexts and similar market or budgetary constraints. The inquiry also seeks to isolate in systems otherwise similar the separate influence of the locus of power in the larger society, the form of organization of the actors, and their relationships upon the substantive rules. In general terms the rules, including the procedures for establishing and administering them, may be treated as the dependent variable to be "explained" theoretically in terms of other characteristics of the industrial relations system.

Whatever the specific content of rules and regardless of the distribution of authority among the actors in the setting of the rules, the detailed and technical nature of the rules required in the operation of an industrial society tends to create a special group of experts or professionals[18] within the hierarchies of the actors. This group within each hierarchy has the immediate responsibility for the establishment and the administration of the vast network of rules. The existence of job-evaluation plans, incentive or piece-rate systems, engineering time studies, pension plans, and many seniority arrangements is ample evidence of the role of experts or professionals in rule making. Indeed, one of the major problems within the hierarchies of actors is the difficulty of communication and genuine understanding between such experts and the rest of the hierarchy. There

may be on occasion a greater community of interests and understanding among such experts in different hierarchies than between them and the lay members of their own hierarchy.[19]

The experts tend to place the interaction among organizations of workers and managers and special governmental agencies on a more factual basis with careful technical studies made within each of the various hierarchies, or on a cooperative basis. These expert or professional ties on specialized issues tend to add to the stability of the system and to bind the actors closer together. The resort to a study by experts is an established method of reducing, at least for a period, tensions that arise among the actors.

The rules of the system may be expressed in a variety of forms: the regulations and policies of the management hierarchy; the laws of any worker hierarchy; the regulations, decrees, decisions, awards, or orders of governmental agencies; the rules and decisions of specialized agencies created by the management and worker hierarchies; collective-bargaining agreements, and the customs and traditions of the work place and work community. In any particular system the rules may be incorporated in a number of these forms; they may be written, an oral tradition, or customary practice. But whatever form the rules may take, the industrial relations system prescribes the rules of the work place and work community, including the procedures for their establishment and administration.

The Ideology of an Industrial Relations System

An industrial relations system has been described so far in terms of actors who interact in a specified context and who in the process formulate a complex of rules at the work place and work community. A further element is required to complete the analytical system: an ideology[20] or a set of ideas and beliefs commonly held by the actors that helps to bind or to integrate the system together as an entity. The ideology of the industrial relations system is a body of common ideas that defines the role and place of each actor and the ideas that each actor holds toward the place and function of the others in the system. The ideology or philosophy of a stable system involves a congruence or compatibility among these views and the rest of the system. Thus in a community in which the managers hold a highly paternalistic view toward workers and the workers hold that there is no function for managers, there would be no common ideology in which each actor provided a legitimate role for the other; the relationships within such a work community would be regarded as volatile and no stability would likely be achieved in the industrial relations system. It is fruitful to distinguish

disputes over the organization of an industrial relations system, or disputes that arise from basic inconsistencies in the system, from disputes within an agreed or accepted framework.

Each of the actors in an industrial relations system—managerial hierarchy, worker hierarchy, and specialized public agencies—may be said to have its own ideology.[21] An industrial relations system requires that these ideologies be sufficiently compatible and consistent so as to permit a common set of ideas that recognize an acceptable role for each actor. Thus in the industrial relations system of Great Britain[22] the philosophy of "voluntarism" may be said in a general way to be common to all three actors; this accepted body of ideas defines the role for manager and worker hierarchies and defines their ideas toward each other within the system; it also prescribes the limited role for specialized public agencies. The ideologies that characterize the industrial relations arrangements, for instance, of India[23] and the Soviet Union[24] are each different from the British.

The ideology of an industrial relations system must be distinguished from the ideology of the larger society; but they can be expected to be similar or at least compatible in the developed industrial society. In the process of industrialization, however, there may be marked differences between the ideology (relevant to the role of managers, workers, and public agencies) of the actors within the industrial relations system and other segments of the larger society which may even be dominant, such as the ideology of the traditional agricultural landholders. Nonetheless, the ideology of an industrial relations system comes to bear a close relationship to the ideology of the particular industrial society of which it is a subsystem. Indeed, in the absence of a general consistency of the two ideologies, changes may be expected in the ideologies or in other facets of the industrial relations system.

The term ideology may convey a more rationalized and formalized body of ideas than is intended. The actors in the system are often inclined to be pragmatic and may hold ideas that are to a degree inconsistent or lack precision. But hierarchies of managers and workers (when formally organized) and public agencies also tend to develop or adopt intellectuals, publicists, or other specialists concerned with articulating systematically and making some form of order out of the discrete ideas of the principal actors. These statements, preachments, and creeds tend to be reworked and reiterated; in the process even a fairly explicit ideology may emerge. Each industrial-relations system contains its ideology or shared understandings.

AN ILLUSTRATION

The preceding section has been concerned with developing in general outline the analytical concept of an industrial relations system. It was a formal and definitional exercise; no one looks for precise correspondence between the world of construct and the world of experience. But the concept may be clarified, and the unity and interdependence of a system may be more simply portrayed, if an illustration is very briefly presented at this stage of the exposition. For anyone familiar with the particular industrial-relations system, the description may appear more like a caricature.[25]

The railroads in the United States have a distinctive system of industrial relations. It gradually evolved over the past eighty years to its present form and has been relatively stable for almost three decades; there have been some changes in rules, of course, but the main structure of the system is well established. The actors are the Class I carriers, the national railway labor organizations, and the specialized governmental agencies including the National Mediation Board, the divisions of the National Railroad Adjustment Board, emergency boards, and the Railway Retirement Board. The railroad industry is the only sector not covered by workers' compensation; claims for injury are handled under tort law.

The carriers above the management hierarchies of individual railroad companies are organized into three conference committees (Western, Eastern, and Southern railroads) and then usually into a negotiating committee for national cases. Within a single railroad the management structure is organized into divisions according to operating requirements, length of track, and other technological factors. At each level in the hierarchy from a division to all carriers as a group there are specialized personnel concerned with the formulation or administration of rules.

The labor organizations are composed of some twenty-three national craft organizations that are federated together in several ways: the six shop crafts operate together on many problems of common concern in the repair shops; the fifteen nonoperating unions, including the shop crafts, negotiate together on general wage changes and fringe compensation; the operating unions have negotiated singly or in various combinations, but in no fixed grouping; almost all the organizations are affiliated to the Railway Labor Executives' Association. The union and management hierarchies from the division to the top levels have corresponding and opposite numbers at each level; rule formulation and administration take place at each level appropriate to the generality of the issue.

The specialized governmental agencies were established by national

legislation in which both parties were actively involved in discussions and proposals; on occasion the legislation reflected the agreed-upon views of the management and employee hierarchies. These agencies determine the bargaining representative for the craft or class, decide disputes over the administration of rules that cannot be directly resolved, and mediate and make recommendations on issues of new rules that cannot be otherwise settled. The parties are both very much involved in the processes by which policy-making appointments to these agencies are made.

The technological context of railroads has many distinctive features affecting the relations of managers and workers: The train operating divisions use small crews working together and in movement far from close and immediate supervision; complex and expensive equipment is utilized with a high ratio of capital to worker; the technology has produced steadily increasing speeds and longer trains; a very high degree of responsibility (and considerable skill) is required of the major operating positions; the costs of accidents can be consequential; the hours of operations for equipment may be around the clock, not conforming to normal factory schedules, although repair shops and many clerical operations conform to conventional work weeks; the transportation services are regarded as vital to many other industries and to the community generally; there is a high degree of continuity of operations in many departments, and the public-utility status of the railroads requires the maintenance of published service; there is intimate contact with the public in the train service and in the selling of tickets and at corresponding points with freight customers.

The market context may be characterized by the governmental determination of commodity and class freight rates and passenger fares (product prices), by the keen competition of other forms of transport, and by a high sensitivity to fluctuations in general levels of business activity.

The locus and distribution of power in the American community have had significant impact on the structuring of the railroad industrial-relations system. The relatively larger role of governmental processes (legislative and administrative) in railroads for a very long period has led to the development of managerial and employee hierarchies particularly sensitive to and knowledgeable of the legislative and administrative bodies concerned with railroad matters as compared with most other management and labor organizations. The wide distribution of railroad workers across the country, even in agricultural states, combined with the significance of governmental agencies for railroads, has resulted in a legislative and administrative influence and expertise unrivaled among American labor organizations.

The ideological aspect of an industrial relations system is likely to be

most distinctive in considering a system of a whole country; it has been suggested that the ideological character of a particular industrial-relations system within a country shares both many of the ideological features of the full industrial-relations system of the country and the ideological character of the whole society. The American railroad industrial-relations system does share much of the ideology of the American collective-bargaining system and society. All three actors have consistent ideas of their roles and the functions of the other actors. There are some distinctive ideas and interests that further help to bind this system together: the common concern with the growing competition of other forms of transportation has led on occasion to mutual discussions of common interests and to proposals for common action on such matters as state laws regulating the length of trains. There is some development of a sense of a common stake in a livelihood threatened by competition. Then, large sections of railway management have come from the ranks, perhaps more than in most industries, and this provides some sense of a common experience and a mutuality in looking at problems.

The rules developed by the railroad industrial-relations system are related to the contexts already noted: The historic rules on rates of compensation for operating personnel involve the "dual method of pay" under which elapsed time and mileage traveled affect earnings. The weight of engines and the length of train also affect earnings of some operating crafts. Nonoperating personnel have more conventional methods of compensation. These various methods of pay are tailor-made to the technological and market contexts. The rules regarding the rights and duties of employees are significantly affected by the continuity of railroad operations, by the difficulties of comparing individual workers over a whole railroad property, and by the large element of responsibility in many jobs. As a consequence, "seniority" in specified "districts" has a distinctive role to play, and it permeates the whole system of rules. The rules on promotion, layoffs, and transfer were evolved from the technological and market contexts and are consonant with them and the rules on compensation.

The procedures used for the administration of the complex of rules ending in the divisions of the boards of adjustment are likewise congenial to the other rules and to the geographical diversity of operations; the procedures work very slowly for there is less imperative for speed than in most other industrial-relations systems and "retroactivity" to the date a claim is filed is a significant feature to the operation of the system. The procedures established by statute providing for the unique role of the government in the making of agreements in the event the parties fail to agree (emergency boards) is derived from a common recognition

within the system of the essential nature of railroad transportation to the national community. The absence of a fixed duration to collective-bargaining agreements and rules, except as otherwise specifically bargained, is a distinctive feature of the system attributable to the lengthy procedures used in making contracts and to the system of setting railroad rates and fares.

The railroad industrial-relations system has its own social customs. As distinct from formal channels, there are important informal and personal lines of communications among persons in all three groups of actors. The professionals in each group particularly develop distinctive habits in their interactions in conferences and formal hearings, in their places of meeting, and even in their social gatherings. "There is a great deal of affinity between those who were engaged in the same occupation . . .," ". . . the employers and workers . . . were bound together by a common experience and a common love for their occupation. . . ."[26] The railway industrial-relations system is a very human institution; flesh and blood soften analytical bones.

Such a brief description of the American railroad industrial-relations system cannot adequately convey its distinctive features and internal unity since no systematic comparisons or contrasts have been drawn with other industrial-relations systems.[27] It is in the perspective of other systems that the reality and the distinctive characteristics of a system can be more fully appreciated and understood.

SOME IMPLICATIONS OF AN INDUSTRIAL RELATIONS SYSTEM

In the preceding discussion, an industrial relations system has been used on occasion to refer to a subsystem of a national society, at times to a system of industrywide scope, and in other settings to a system in a single enterprise. The term is designed to be applied to each depending on the scope of the discussion. The smaller the unit to which the term is applied, the larger the context, and in general the larger the influence of givens outside the system. This multiple usage of the term only requires that the reference to scope be made clear in each instance. The formulation has the merit of facilitating comparisons (and contrasts) within a country, between comparable sectors of different countries, and between industrial relations systems of countries taken as a whole.

The usage that has been developed recognizes that a group of allied systems may be integrated into a larger sector or into a national system.

In turn many systems may be subdivided into specialized smaller systems depending upon the purpose at hand. The American railroad industrial-relations system is an integral part of the larger national system; it is also meaningful to explore the industrial relations system on the Baltimore and Ohio Railroad or some other separable railroad and even in particular shops or a division. It must be recognized, however, that not all industrial relations systems are equally compatible or divisible; combinations and separations cannot be made arbitrarily that destroy the sense of unity in the resultant grouping.

The preceding formulation calls attention to the fact that a national industrial-relations system has a variety of more limited systems within it; they are not all the same and the features that are ordinarily regarded as distinctive to a national system do not all enter equally into each industrial-relations systems within its borders. It becomes evident that the industrial relations system characteristic of a country or a region may arise because of the dominance of a particular industry. For instance, the relative influence of the automobile industry in Detroit and basic steel in Pittsburgh give industrial relations in these metropolitan areas a distinctive coloration. A company town is another illustration. In general terms, the industrial relations systems of any aggregate will be shaped by the relative prevalence of different types of the component systems.

The import of the discussion is that international comparisons of industrial relations systems may be less fruitful or even misleading if confined solely to countrywide systems. It is essential to examine for comparable sectors and industries the component industrial-relations systems in the various countries. In such comparisons, with the technology and the market contexts relatively constant, it should be possible to highlight more sharply the separate effects and characteristics of the national industrial-relations systems. A comparison of industrial relations systems across countries in such industries as maritime, coal mining, aviation, automobiles, textiles, basic steel, and construction, to mention a few that appear to have rather distinctive and decisive technological and market contexts, should permit some testing of the impact of national systems in these cases. Are the rules developed in these industries similar among countries or do they vary substantially? Which rules show considerable similarity and which reflect the diverse influences of the national industrial-relations systems? It may be suggested for exploration that in some industries, such as those just noted, the similar technological and market contexts result in a number of comparable rules, overriding the influence of national peculiarities, while in other sectors the influence of the national systems is more paramount,

overriding any similarities in the technological and market context or reflecting significant differences in these elements of the context. A comparison of national industrial-relations systems and systems for particular sectors across national lines should accordingly prove of considerable theoretical interest. These issues are explored in considerable detail in Chapters 5 and 6.

It is suggested for further exploration that for industrial relations systems of a lesser scope than a country, thus on the level of an industry, the technological and market (or budgetary) contexts are likely to be most significant in influencing the comparative rules that emerge. In the comparison of national systems the locus and distribution of power in the larger communities as given to the industrial relations systems are likely to be most significant in influencing the characteristics of the distinctive national rules. It may also be inferred, to be tested and explored later, that there is a higher degree of uniformity in the substantive content of rules among countries in comparable industries that concern the duties of employees, discipline, safety, and many aspects of compensation at the work place than the degree of similarity among rules concerning the establishment and administration of substantive rules. A diversity of procedures may still result in similar substantive rules.

The attention of industrial relations systems places comparisons among systems on a basis to analyze differences (and similarities) of substance rather than form. The simple description of industrial relations in several countries (or in several industries in one country) tends to be concerned with institutional shapes and forms rather than with substantive operations of the systems. A description of practices in Great Britain, for instance, would point out that rule making is determined in some industries by voluntary private collective bargaining, in other industries by publicly established wages councils, and in still others by joint industrial councils (JIC's). The description would go on to elaborate the differences in form, origins, and legislative background and the procedures that are used by these bodies. While these institutional variants are of interest for some administrative and historical purposes, they tend to obscure the unity of the British industrial-relations system. Allan Flanders has well said, "It is difficult to know where statutory regulation ends and voluntary regulation begins, it is still more difficult to discover any practical significance in the distinction between industries with JIC's and those with some other arrangements for collective bargaining."[28] The attention to rule making in industrial relations systems provides a common denominator for the comparative analysis of systems of different forms.

The idea of an industrial relations system implies a unity, an interdependence, and an internal balance which are likely to be restored if

the system is displaced, provided there is no fundamental change in the actors, contexts, or ideology. Industrial relations systems show considerable tenacity and persistence. The essential unity of an industrial relations system raises doubts about the transfer of rules, practices, or arrangements from one system to another. There is, for example, a prima facie case against the export of the terms of American collective-bargaining agreements or American-style unions to industrial relations systems with essentially different actors, contexts, and ideologies. The same may be said, of course, for the export of features of any other industrial-relations system, except that in the spectrum of world experience the American arrangements are likely to be relatively more specialized.

In the preceding discussion, an industrial relations system was developed at one moment in time. But an industrial relations system may also be thought of as moving through time, or, more rigorously, as responding to changes that affect the constitution of the system. The web of rules can be expected to change with variations in the three features of the context of the system. Changes may be expected in the complex of procedural and substantive rules with alterations in the technological context, in market or budgetary constraints, and in the locus and distribution of power in the larger society. In this way Chapters 7 and 8 focus attention upon the consequences of economic development for industrial relations systems. Changes may originate within the organizations of the actors; the task of analysis is to indicate the consequences for the complex of rules. The formal analysis also suggests that changes in ideology, as a response to the larger society, may also come to have an impact upon the rules established by an industrial relations system. An industrial relations system provides a means of organizing inquiry into changes over time in the rules and other features of industrial relations.

The chapter has set forth a formal theoretical framework with which to approach industrial relations aspects of experience. The test of this concept of an industrial relations system is to be found not primarily in its elegance (or lack of it) or even in its internal consistency but rather in the process of making detailed studies of industrial relations systems among countries, on a countrywide and industry basis, and within a single country among different sectors. Only its application to particular situations will effectively show whether it usefully calls attention to significant relationships and enlightens new and neglected features of experience. The test of a model ultimately is in its use.

2

THE TECHNICAL CONTEXT OF THE WORK PLACE

Managers, workers, and specialized government agencies—the actors in every industrial-relations system—were represented in the preceding chapter as interacting in a specified context. This environment is composed of (1) the technical conditions of the work place and work community, (2) the market or budgetary constraints, and (3) the locus and distribution of power in the larger society. The present chapter is concerned with the first: the technical context of the work place. Chapters 3 and 4, respectively, treat the other two features of the context.

The discussion in separate chapters of these three aspects of the full context should not obscure their mutuality and interdependence. The reference to a single context emphasizes this unity and a system stresses the full range of interaction in a specific context. A three-part context (and a three-chapter discussion) is necessarily arbitrary to some degree. Thus the size of the work force at one work place is treated as a technical feature, but it is clearly influenced by market constraints where economies of scale are in part determined by relative factor prices; similarly, the importance of labor costs to total costs is treated largely as a market constraint although technological coefficients impose limitations on substitution among factors. The context is taken apart in these three chapters and examined analytically in order to develop the ideas more clearly; later chapters that examine illustrative industrial-relations systems stress the unity of the context and a system.

To start with the technical context does not imply a rigid determinism or a form of social predestination in which the "modes of production," to use the Marxian phrase, precisely establish the superstructure of every social system. The technical context is only a part of the whole context and interacts with the other two aspects in varying patterns. Nonetheless, the present emphasis does upgrade the significance of the technical context, and indeed all aspects of the context, in the under-

standing of industrial relations systems, in contrast to the current attention to "human relations," which too often appears to treat the interaction of the actors in a vacuum, as if the context made no difference to the results of their interaction.

The technical context of each industrial-relations system is to a degree unique, defined by a wide variety of particular facets. These technical conditions are decisive to the creation of the complex of rules by the actors. They are also significant to the form and operations of the hierarchies of the actors. At any one time the technical context is given, but over time it may be expected to change. Such changes tend to alter the rules, the organization of the hierarchies, and the operation of an industrial relations system. These abstract propositions are developed and illustrated in the course of the present chapter.

CHARACTERISTICS OF THE WORK PLACE AND THE RULES

The technical context orients or places workers and managers in a specific place of work in which they perform certain particular operations and functions. Industrial society contains a vast variety of types of work places, infinitely more than any preceding society, and requires widely diverse operations and functions. The range of rules of the work place is correspondingly multiplied. Seven characteristics of the technical context are to be distinguished; the first group of four characterize workers and managers relative to the type of their work place, and the second group of three are differentiated by the operations or functions the actors perform.

Types of Work Place

1. *A fixed or variable work place.* Technical conditions largely determine whether the work place is geographically fixed or variable, and, if it is variable, whether the fluctuations are through long or short distances, whether the variations involve a periodic or variable pattern, and whether the work place itself is mobile, as in the transportation industries. There is a tendency to think of industrial relations systems in terms of fixed places of work, and it is true that a high proportion of factory and office jobs involve a stable work place. An electric-power generating station, a textile spinning plant, or a basic-steel mill are illustrative. An industrial

relations system of the plant-level type evolves around such fixed work places. There is, however, a significant number of industrial relations systems that involve work places that are variable in a number of respects or are even mobile. A significant proportion of employment in the following sectors is so characterized: transportation (railway, maritime, trucking, transit, and aviation); construction; some types of mining; many repair, service, and sales operations; some medical practitioners; many professional positions, and migratory agriculture and forestry. Perhaps as many as one out of four or five workers may be employed in a geographically variable work place. Moreover, there is a variety of operations within fixed work places that involve a range of movement; meter readers for the utilities and many maintenance and repairmen in industrial plants provide an illustration. These types of operations often create special features in industrial relations within the larger work place. The mobility of maintenance personnel among plant workers makes them of special interest to union organizations for their wide contacts. Special problems frequently arise in the United States regarding the determination of the bargaining units for employees with variable work places, even when the pattern of movement is within a plant.

International airplane flight operations probably constitute the maximum in variability of the work place, while other industries, such as strip mining, involve only small changes in the work place. The pattern of change may be regular and hopefully predictable, as in a transportation system, or irregular and uncertain, as in many types of construction. In instances of regular variation in work place, the duration of work at any one place may be short, as in door-to-door selling, or substantial, as in oil drilling or periodic turbine overhauling. A relationship between given workers and managers may thus take place in a variety of work places, which are differentiated solely by whether they are fixed or variable in locale.

It is central to the present analysis that such differences are vital to the substantive rules. The variable work place, depending on the type of movement, clearly requires a range of rules not involved normally at the fixed work place. Where the work place itself is in motion, as in the transportation industries, a complex of specialized rules relates to this movement, speed, route, schedule, manning, safety, and emergencies. Regardless of how these operating rules are set, whether by any one of the actors or by some combination of all three, special rules regarding the relations of managers and workers arise concerning supervision, special methods of compensation, rights to free transportation, manning schedules, hours, meals, lodging, and other problems posed by a mobile work place. In other than transportation industries, where the work

place is variable rather than itself mobile, rules are frequently required regarding such topics as the cost and method of transportation between work places, provision for board and lodging, time and place of reporting, and special forms of reports and monitoring in view of the frequent complexities of supervision. The automatic machine installed in New York City on beer distributors' trucks in order to record the route and length of stops at taverns is one indication of the specialized problems of supervision that arise with a variable work place.

The technical context of a fixed or variable work place not only affects the substantive rules of the industrial relations system but also shapes the internal organization and the operation of the hierarchies. The management or worker hierarchy or governmental agency treating transportation, or, more generally, variable work places, may be expected to be different from those designed for fixed work places. The mere scope of the hierarchies is wider in variable work places; delegation to supervisors may have to be more complete and instructions may have to be more detailed when access to top levels in hierarchies is more remote; reporting takes on even greater significance; operating problems may frequently be more variable than in a single locale. Under union conditions the variable work place poses special problems of policing the agreed-upon set of rules and involves distinct relations between union officers and members that are not so likely to be present in a fixed work place. Special arrangements or deviations from rules made among workers or between minor supervision and individual workers under shifting locale and variable work places are more difficult to detect.

If the fixed or variable character of the work place shapes in part a distinctive industrial-relations system, then changes in the technical context (which change a work place from fixed to variable or vice versa, or which alter the nature of such variation) can be expected to change features of the rules and the organizations of the actors. The industrial relations of door-to-door selling is different from over-the-counter selling even if the same managers and workers were involved; wholesale milk delivery to depots at stores is a distinctive system from door-to-door milk delivery to individual customers. Changes in the work place context of the industrial relations system affect the complex of rules and the organization of the actors.

2. *Relation of work place to residence.* The technical context establishes a number of different possible relations between the work place, fixed or variable, and the residence of the workers and managers. The work place and residence, at least for considerable periods, may both be mobile as in the maritime[1] and sea-fishing[2] sectors. The work place may be variable, but within such a territory that residence is not affected, as

in the case of local trucking, delivery, some repair services, and local transit. The work place may be variable over such a wide territory, and in particular patterns, that some workers and managers are periodically away from normal residence, as in the case of airplane flight crews[3] and those in traveling sales organizations. In still other instances residence and work place are both migratory as in types of construction and agricultural labor contracting.[4] Finally, the place of work and residence may be relatively isolated as in mining, plantations, and timbering operations, concentrated in company towns and government reservations, or diffused in urban areas.

The complex of rules established in industrial relations systems with these sorts of technical contexts are likely to develop provisions that reflect the special relation of work place to residence. Maritime contracts have spelled out in detail the living accommodations aboard ship including such details as how often clean sheets and a new bar of soap are furnished. Logging-camp industrial relations have on occasion been concerned with the menu and quality of meals. In the fishing industry, where compensation is frequently related to value of the catch, the rules spell out which expenses of the voyage, including food and living expenses, may be deducted from the proceeds before the division between the workers, captain, and managers (owners). Provisions in rules regarding allowances for board and lodging are widely adopted where transportation or construction crews are required to be away over night. Provision for family transportation or home leave are general in government or private employment when a work place is separated from an established residence for long periods as in the oil companies, foreign service, or the civil service of United Nations organizations.

The technical context may involve a work place and normal residence, which are both relatively isolated such as in many mining communities, on plantations, or on government reservations. In these instances industrial relations rule making tends to become concerned with problems of the community: the provision of housing and rents, medical services, transportation, perquisites, and payments in kind. A review of the history of collective agreements or regulations applicable to coal mining[5] or to plantations[6] illustrates rules that are related to the distinctive relationship of residence and work place.

The different scope of rule making created by bringing issues of residence and the work place together also tends to affect the form and internal organization of the actors. It is apparent, for instance, that concern with the housing problems of a work force will create some specialized forms of management organization. The points of contact and potential issues among the actors will be broadened by consideration of

rules related to residence, subsistence, and perquisites. Thus company housing involves such questions as whether managers shall be distributed through the community or live close together; whether employees and managers shall be kept apart or integrated into the rest of the community; what shall be done with retired or striking workers. The levels of rents and wages become more closely intertwined and developments in the community are probably even more directly reflected in the plant and vice versa than would be the case if plant managers did not also have formal community responsibilities. The significance of these issues is illustrated by the policies of Middle East oil companies;[7] they were much in evidence in the period in which the United States government maintained Oak Ridge and Richland as isolated communities in the atomic-energy program.[8]

A change in the technical context, in the relations of the work place to residence, may be expected to change both the complex of rules and the organization of the actors in an industrial relations system. In many plantations and isolated mining communities, managements have tended to establish more of a cash nexus and to reduce the extent of perquisites and services. Home-purchase arrangements have been widely encouraged. Such changes in the relation of the work place to residence have necessarily changed the complex of rules, creating more rules and organization for a period to handle home purchase although eventually decreasing the necessary regulations when employees have homes or secure homes without assistance of the company. Home purchase also changes the relationships among the actors; there is less paternalism where industrial relations do not also include questions of the household. The change in community status of Hanford and Richland directly affected the rules and the relations among the managements, the unions, and the specialized government agencies (Atomic Energy Commission and Atomic Energy Labor Relations Panel) by reducing the scope of interaction and the range of activities. By contrast, the need to expand coal output after World War II in new communities and regions in Europe and the USSR was associated with an extension of enterprise housing to attract manpower.

3. *Stable or variable work force and work operations.* The technical context substantially determines whether an industrial relations system involves a relatively stable work group or one in which the persons and the size of the group is in frequent flux. Several types of situations are to be distinguished. The work operations may be of short duration and associated with rapid turnover or changes in individuals as found in situations involving migratory agricultural labor, movie extras, the talent field in general, and some construction workers. The work operations may be of short duration but associated with a work group that is fairly

steady from one hire to the next as illustrated by longshoring, where a number of gangs, although by no means all, may be relatively stable over time. The work operations may be relatively steady but associated with a relatively high degree of turnover in the work force; a sales force of young women in some department stores or restaurants would be illustrative. Some work operations may be relatively steady but fluctuations in the volume of work may result in a steady core of workers with a high degree of variation in employment for others. The seasonal garment, millinery, and tourist trades may be cited as examples. Some seasonality may arise for technical reasons (such as weather) and other seasonality is dependent upon styling and other considerations of more economic character. Finally, the limiting case of stable work operations associated with a stable work force should be mentioned. Among the great many illustrations that might be cited are large sectors of public employment in the civil service and the operation of power stations.

A stable or variable work force is one of the most significant conditions that affects the complex of rules of an industrial relations system. The rules concern hiring and temporary or permanent layoffs. Few questions are of greater interest to all participants in an industrial relations system. From what source and by what procedures are new employees to be engaged? What rights have previous employees? Who shall decide which workers shall be hired and in what sequence? Under what circumstances may there be any reduction in force? What procedures are to be followed in reductions of forces? Who shall have control over decisions on layoffs? Which workers shall be separated first and in what sequence? Which workers have superior rights? How shall limited job opportunities be shared? These decisions vitally affect costs and the managerial role; at the same time they are central to the degree of employment security of workers. These issues are of greatest urgency in a technical context with a high degree of variable operations since hirings and layoffs are more frequent than under stable conditions.

The substantive rules that govern hirings and layoffs may take a variety of forms such as last-in-first-out, or first-in-first-out, or first-in-last-out, share-the-work-equally, or simply first-come-first-serve. The rules may also specify certain employees as having top priority, such as representatives of unions or works councils, and others who have least priority, such as temporary or foreign workers. Ability or competence to perform the particular position, marital status and number of dependents, or residence may be significant. The rules may involve the operation of a hiring hall, controlled by any one of the actors or by any combination of actors. Such hiring halls tend to develop more complex rules. A maritime radio-operators plan, for instance, assigned priority to a vacancy on the basis of a combination of duration of unemployment

(first-in-first-out) and length of previous employment. A long stretch of employment under this plan delayed access to work compared to those with shorter periods of previous employment. A hiring hall, however, may be simply designed to facilitate information on job opportunities and may be associated with a variety of possible rules on priorities and relative rights for selecting the individuals.

Not only are a significant set of rules necessarily shaped by the stability or variability of persons at the work place, but so also are the structure and internal organization of the actors and their relationships. The frequent change in the size and scope of operations places an added premium and continual rebuilding of the work place organization. The premium on organizing ability is high where each new movie production, construction project, or voyage involves a new and different combination of workers and supervision faced with some new assignment. The new workers and supervision must quickly be fitted into a working organization. The frequent hiring of new workers and managers may require specialized departments within management and employee hierarchies, or hiring halls may become a governmental activity. Specialized procedures and information on workers, managers, their qualifications, and job opportunities are usually required where there are highly variable work operations. A number of forms of compensation, such as vacations with pay, health and welfare benefits, and pension plans, pose special problems of administration where the work force is highly variable. Special administrative arrangements in a locality—on a regional, national, or even international basis—may be required.

The relations among workers and the relations with supervisors can be expected to be different when the work force is highly variable than under stable conditions where the same workers and managers work together steadily for many years. The forming and reforming of work groups for each production job, voyage, site, and other appropriate term for a work place involve human relations different from the more permanent patterns of the stable industrial plant or department. Where seasonal patterns are involved, there may be marked cleavages between the temporary groups and those of the hard core or more permanent group.

A change in the technical context of an industrial relations system in respect to the stability or variability of the work force and work operation can be expected to create a tendency toward a change in the complex of rules bearing on hiring and layoffs and in the structure of the actors and their interaction. The contrast between the rules regarding general cargo ships and certain tanker operations with steadier employment illustrates the role of this feature of the technical context. Another example is the introduction of seniority and on occasion the wage-scale

change when workers are switched from outside construction to a more steady captive department of a department store or plant. The displacement of migratory agricultural labor and contractors by the farm household or locally hired labor in the wheat harvest, associated with a change in machinery, is an even more striking case. A change in the stability or variability at the work place, including changes in seasonality, tends to result in new rules, new organizational structure of the actors, and new patterns of human relations.

4. *Size of the work group*. Technical conditions, in combination with market and budgetary constraints, substantially determine the size of the work group, which in turn has a major impact on the rules established by the actors and the form of their hierarchies and relationships. In modern industrial society the size of the work group varies from single workers and managers to aggregates of tens of thousands in a single place at work.

The larger the number of workers and managers at the work place, in general, the greater the formalization of rules into written codification and policies. Informality and personal contacts among small groups is replaced by organizational channels in larger work places. Internal communications become more complex with the growth in size. Formal rules are more essential and characteristic of the larger work place.

The rules of compensation are particularly formalized in larger-sized work groups; personalized wage rates give way to the wage scale for occupations, to the job-evaluation plan, and to highly elaborate codifications of other forms of compensation. Differences in compensation among similarly situated workers becomes a source of complaints and the tendency to correct such differences by establishing uniformities may be very costly. The establishment of acceptable rules of compensation, with uniformities among some workers and differences among others, is one of the central points of interest of any hierarchy of workers. The larger work places, with greater specialization, tend to have work operations and positions not characteristic of smaller establishments; in smaller work places many different operations are assigned to the same person. Differences in managerial duties and skills also vary with the size of work place. Accordingly, the rules of compensation in contexts otherwise similar can be expected to involve more types of operations and to be more complex the larger the scale.

The impact of size on compensation rules can be illustrated in the hotel industry where the larger operations have the more elaborate dining rooms and kitchens; wage scales must make provision for types and skills of chefs and waiters unknown in smaller hotels. In textile weaving mills the division of duties among weavers, loom fixers, and various auxiliary help varies characteristically by the size of the weave shed. In

some mills the weavers may have some responsibility even for minor repairs and maintenance, cleaning, and handling materials and product that are specialized to particular job classifications in larger mills. Compensation may be expected to vary by virtue of such differences in job content that are directly related to size of operations.

In a small-sized operation the handling of time off for funerals, and personal and family reasons, allocation of overtime, time off before holidays and eligibility for vacation pay, and a variety of other day-to-day questions that affect total compensation and relative pay among workers tends to occur informally. But in larger-scale work places a large complex of rules tends to arise on these subjects. In the absence of formal rules, precedents in one situation may be extended to other cases, and the number of situations that arise are significant enough to warrant policy and assure a measure of uniformity.

In addition to compensation, work place size tends to influence the complex of rules on promotions and transfers and the relative rights in jobs of workers. There are more potential openings and more possible jobs into which a worker may be transferred the larger the scale. Indeed, the possible combinations increase exponentially with size. There are more potential problems of transfer and promotion that could arise; hence there tends to be a larger body of rules. In establishments with relatively fixed work forces, the scope of the group or seniority district that is canvassed in any promotion is an important rule vital to both managements and workers. The scope of the group reviewed, or the priority in which different groups are examined, is likely to make considerable difference to both actors. The scope of the groupings is influenced by size and specialization, regardless of the precise rule used to determine the priority of promotions or transfers in a given district.

The size of operations affects not only substantive rules but also very much the organization of the actors. Size is decisive to the shape and layers of the hierarchies of the actors and their internal decision-making processes. Size is vital to the specialization of management and to the role of staff in all hierarchies. In particular, a large-scale managerial hierarchy tends to develop an elaborate staff of personnel and industrial relations specialists to develop and administer the system of rules. Among workers, a formal organization is more likely to emerge the larger the scale; specialized personnel also emerge to treat the many aspects of rule making and administration. In a small work place the manager personally performs industrial relations functions, but with increasing scale a specialized staff emerges to perform a growing variety of distinctive industrial-relations activities under the general policy direction and review of top management.

In analyzing industrial relations systems over time, the change in size

of the work place is one of the factors in the technical context most likely to be reflected in variations in the system of rules and the form of organizations of the actors. Wartimes have afforded many illustrations of rapid changes in size, as in shipyards and aircraft and munitions plants in which small-scale operations have been transformed suddenly to large scale; such a change in the technical context has wide consequences for the complex of rules and the organization of the actors. Economic development has brought more gradual but no less consequential changes in the size of work places.

Types of Work Operations

The second group of features of the technical context of an industrial relations system refers to the nature of the services performed by workers and managers, as distinct from characteristics of the place of work.

5. *The job content.* The technical context substantially influences the occupations, jobs, or operational content of services performed at the work place and the relative distribution of each type of work. This facet of the technical context indicates whether the work performed may be characterized as manual, clerical, or professional services and in what proportion these types of operations are found; it is an index of the skill and responsibility composition and distribution at the work place. These general terms cannot adequately convey the diversity of work operations in modern industrial society. The aspects of the technical context here considered are those which normally enter as the factors in a job-evaluation plan, however defined and however finely subdivided. The headings of skill, effort, responsibility, and job conditions used to summarize a group of eleven factors in the National Electrical Manufacturers' Association plan are illustrative.[9] Another list of factors is that used in the "Standardized Method of Job Evaluation," adopted in the Netherlands providing for ten factors: knowledge, self-reliance, contact with others, authority, power of expression, dexterity, material and machine sense, disadvantages accompanying the work, special qualifications, and risk of damage.[10] A variety of other listings of factors might be cited,[11] but these illustrations show that differences in job content take a variety of forms reflecting the technical context.

While it is widely recognized that differences in job content among work operations of the sort described in job-evaluation plans are likely to be reflected in differences in wage or compensation rates, it is not generally seen that such differences among jobs are also likely to be associated with differences in the complex of rules other than compensation. Thus the technical context defines the extent of "unavoidable

hazards" or "risks of accidents" or "responsibility for the safety of others," and these factors in job-evaluation plans are used to describe and to weigh one aspect of job conditions. But the actors do not typically limit their concern to hazards by some added element of compensation. Safety rules are prescribed. Lead shoes, goggles of certain color and thickness, metal hats, and various types of protective clothing against weather, radiation, altitude, acid, fumes, dust, cold, or heat may be specified. Periodic medical examinations may be required. Elaborate rules may also refer to the use of equipment and operating procedures: provision for guard rails, nets, gauges, and indicators, speeds of operation, testing procedures, and the like. The rules normally make provision for safety committees, steps to be taken in the event of accidents or a danger alert, and for the setting aside of normal operating rules, such as those that refer to hours, in the event of a safety emergency or accident. The authority to declare a condition unsafe and to remove workers and supervision from danger may be specified. In some work places customs have developed that shut down operations for the balance of the day when a fatal accident occurs. Such safety rules are not found in work places devoid of high degrees of risk to accidents. An elaborate web of rules thus may be expected to arise in a technical context prone to accidents or hazards.

The impact of job content on the rules developed for the work place can be further illustrated by what might appear to be a relatively minor feature of the technical context, the contact of workers with customers, or "conduct toward others" or "human contacts outside the company," to cite the terms employed in a Belgian and a French job-evaluation plan. In most types of factory work this experience probably arises infrequently, but in many work places such as retail trade, transportation, insurance, banking, repair operations, and many offices, this feature of the technical context may be extremely important. The economic or budgetary position of the enterprise may be significantly affected by the way in which these relations between workers and actual or potential customers are handled. Rules may relate to uniforms or other conditions of dress and appearance. Disciplinary regulations may be much affected, as in at least some hotels, where a complaint from a known customer may invoke a heavy penalty, if not discharge, since "the customer is always right," and no procedures for redress between management and worker can involve resort to the customer without fear of loss of patronage. Relations with customers may involve the handling of money, which tends to call forth a wide variety of specialized rules. Provision is made for responsibility in accepting counterfeit money or credit instruments that cannot be reclaimed and for shortages that arise from errors in transactions. There arise procedures for detecting dishonesty

and for prescribing penalties. Special standards for recruiting and disciplinary rules may involve aspects of the personal life of a worker outside the work place on account of the importance of reputation to an enterprise; the cases of the bank teller who habituates the race track and the shoe clerk who has attracted publicity for sexual conduct are the classic illustrations. In a variety of ways the characteristic of the technical context that requires direct contact with customers tends to develop a specialized set of rules.

In similar fashion it would be possible to review each facet of job content and to illustrate how a particular feature of the technical context comes to stimulate particular rules of the work place: A high skill content and a high proportion of such operations tend to create apprenticeship and other programs for training a skilled work force. Professional requirements of a job result in the specification of formal education and degrees for entrance requirements as in education, scientific, and technical fields. A high responsibility for tools and product as in many custodial, guard, and watchman positions often creates specialized hours of work and standards of discipline.

Job content has significance in an industrial relations system beyond its impact on the content of the rules. Job content substantially defines the strategic position[12] of a group of workers in the (production) process at the work place or the strategic position of one work place in the technical flow of goods and services in the society. The opportunity in a given job classification at one work place, plant, or other unit to curtail a flow of products is necessarily related to the content of the work performed. Thus the ability of garment cutters as one occupation to shut down a whole garment factory, by leaving machine operators and pressers without work, contributes to the strategic position of the cutters. Similarly, the capacity of workers in the only engine-block plant in an automobile company to shut down all automobile production of the company (aside from inventories of engine blocks) may provide the workers in such a plant with a degree of strategic power. From this perspective the production and distribution process of modern industrial society has some points that are more vulnerable than others to shutdown or stoppage. These points may be attributed to special skill requirements (patternmakers in a foundry), to channels of the flow of work operations (teamsters), or to temporary shortages of supply or capacity (coal miners in the postwar period). Within an industrial relations system, at the plant or national level, the location of such strategic positions may have significant effects upon the relationships developed among the actors and consequently upon the precise rules that are established and how they are administered.

As in the case of other facets of the technical context, a change in the

job content can be expected to result in a tendency toward a change in the complex of rules. Under a formal job-evaluation plan, changes in the values of the factors that are of sufficient magnitude (and not offsetting) result in a change in the ranking of the job and in its wage classification. Where no formal job-evaluation plan is operative, there is nonetheless a rough tendency for comparable changes to be reflected in changes in wage rates, although not in so discrete or mechanical a way. Changes in job content of a substantial character can be expected to result in changes in the rules that are more or less directly associated with the particular facet of job content. Thus a marked increase in the levels of skill required of the maintenance department(s) in a large plant or industry may lead the actors to institute a formal apprenticeship program. While a shortage of skills and other factors may have also contributed to the same result, the considerable growth of formal apprenticeship programs in many mass-production plants in the American experience of the post-war era is to be attributed largely to the rising levels of technology and skill required for maintenance operations. Such a program may require a grading of existing nonapprentice mechanics, provision for access of some of the present employees to the program (many may be too old or otherwise unsuited), and a variety of other rules.

The introduction of new types of machinery and equipment constitutes a change in the technical context which may have far-reaching consequences on the complex of rules. The complete introduction of mechanical cutting and loading equipment in coal mines frequently seems to have changed the method of wage payment from a tonnage to a time basis. New types of looms in the textile industry, new furnaces in the steel and glass industries, and new printing presses have frequently involved new manning schedules. Higher speeds and new equipment may require new safety regulations. The problem of assignment and allocation of the existing work force to new equipment, such as pilots to new aircraft or papermakers to new machines, may evoke a substantial group of new or changed rules. The new equipment may be designed for continuous operation and lead to a change in the scheduled work week involving rules assigning workers to shifts and affecting compensation. Indeed, some types of machine changes may so alter the technical context of the work place as to require sooner or later a rather widespread revision of the rules. The impact of the diesel engine on the railroads is illustrative.

A change in job content may also affect the strategic position of groups of workers and managers in an enterprise or in the community. The emergence of glass-cutting machines affected the strategic position of hand glass cutters, and the bunching machine, the strength of the hand

cigar makers. A change in strategic position is often associated with a change in market or competitive position as illustrated by the extent to which the community appears to have become somewhat less dependent upon the bus driver and coal miner. More substitutes for these products are available.

6. *Locus of attention of the actors at the work place.* An examination of a range of work places shows that in some the operations are paced and directed by the workers; in others the operations are machine paced and workers adjust and adapt to the pace and rhythm of the machine; in still others there may be little or no equipment or machinery and the center of attention may be customers. The orientation of a work place in these respects is significant to the rules that are established. A more detailed classification of work places according to the moving force or focal point of the attention of the actors follows:

a. Workers direct tools—a sweeper with a broom, a sewing-machine operator, or a surveyor with a transit. The tool may be simple or complex and its operation may involve little or great skill.

b. Workers direct machines—a cutting-machine operator in a coal mine, a truck driver, or a lathe operator. The relationship of the worker to the machine is not essentially different from the worker to a tool except that the machine is likely to be more expensive and involve a greater degree of responsibility.

c. Machine-paced operations—a routine punch-press operator, an assembler placing one part on a moving conveyor as in automobile assembly lines, or spinners in a textile mill. A narrow operation is performed and its timing and position is determined by the machine.

d. Service operations to machines—including maintenance and repair, custodial, and intermittent transportation. These operations could be assigned to (a) or (b) above on the basis of whether tools or machines were involved.

e. Customer services—a waiter in a restaurant, an entertainer, a bank teller, a salesperson, or a professional. In each of these instances the customer rather than a tool or machine is the focus of attention; the customer is being "acted upon" or "reacted to" by both the workers and managers.

It is recognized, of course, that a single actual work place typically contains a number, if not all, of these types of operations. Frequently, however, one type will be so prevalent as to represent the whole work place and provide a distinctive characteristic to the industrial relations system. Assembly plants are likely to be characterized by machine-paced operations despite maintenance departments, and basic-steel mills by the type in which workers direct machines despite some tinplate and wire-mill operations that may be largely machine paced. Department stores

have customer-service and maintenance operations. A newspaper has operations in which workers direct machines in the mechanical departments and customer service orients operations in the newsgathering and editorial departments. On occasions where the same enterprise contains more than one distinctive type of these operations, separate industrial-relations systems may arise. It is also recognized that some operations may be borderline and are not readily placed in this, or any other, classification scheme designed to call attention to the same relationships at the work place.

As a facet of the technical context, the locus of attention of the actors at the work place may well be regarded as simply another feature of job content. The relation of managers and workers to machines or customers deserves separate attention, however, since this characteristic of the technical context tends to give an industrial relations system, its human relations and its complex of rules, some distinctive characteristics. Machine-paced jobs tend to be narrow in scope and highly repetitive, with a cycle and pace imposed by the machine.[13] The rules of such a work place tend to have distinctive concern with rest periods and the speed of machines or assembly lines. Worker-paced tools or machines tend to involve a wider range of activities and more discretion by the single worker. Where the tools or machines and their manipulation are complex, formal training and apprenticeship rules tend to develop in view of the significance of the elements of judgment and discretion on the part of the worker. Consider, for instance, the impact on costs of the garment cutter with an electric knife, a boner with a quarter of beef, or an operating engineer with a steam shovel. The managerial and supervisory arrangements place greater emphasis on hiring or training standards and directions to skilled workers tend to be more general and less precise or detailed. Among members of a work crew there tends to develop a clear hierarchy of job operations for setting wage rates and for promotion within the machine crew (printing presses, paper machines, blast furnaces, or brass rolling mills). On the other hand, among machine-paced operations there is a tendency for much less of a hierarchy in wage rates or promotion; the semiskilled operators even on different machines tend to be more or less in the same category.

Service-type and maintenance operations tend to be less oriented to a particular department and the rules spread throughout the work place, partly because similar operations are found widely throughout an enterprise and partly because service operations are mobile (maintenance men and hand truckers) and comparisons are more readily made. The customer-service type of operation, as noted above, tends to produce a distinctive set of rules on discipline and may require special regulations on the handling of money.

7. *Hours of operation of the work place.* The technical context of the

work place has a major influence on the hours of the day and week that a work place is in operation. The hours that a place of work operates need have no necessary fixed relationship to the schedule of hours worked by any individual of any group of actors. Some processes are to a large measure technologically continuous and are manned in shifts around the clock: certain processes in oil refineries, basic-steel mills, aluminum-reduction pots, chemical plants, atomic-energy installations, power-generating stations, and long-distance transportation. Other operations have hours that reflect a structure of demand that is outside the typical work hours of the community: publicly scheduled local transportation, fire, police, doctor, and hospital services, restaurant and meal services, entertainment, and a variety of special services such as offered by many drugstores, taxi cabs, and gasoline stations. There are other situations in which the hours of operation of the work place are particularly influenced by cost considerations or short-term fluctuations in demand so that shift work is scheduled outside the regular work day or work week such as over the weekend or for additional shifts through the week or at odd hours.

The hours of operation of the work place pose a wide variety of problems to the actors and a considerable web of rules arises to deal with this range of questions. Rules govern such problems as the authority to establish and to change scheduled hours, to institute new shifts and to set their hours, the criteria used to assign particular workers and managers to these scheduled work times, the premium compensation rates, if any, for scheduled hours and shifts that are outside the hours regarded as normal in the community (weekend, shift premiums, and short periods before or after normal hours), the computation of such premiums in the light of other premiums or the question of whether premiums are to be compounded and the criteria and the authority to allocate overtime among the actors.

The local-transit industry most strikingly illustrates the significance of the hours of operation and of scheduling problems in a complex of rules; a large proportion of the rules in this work place are directly concerned with the scheduling of runs and compensation for hours worked outside a specified spread of hours or outside the schedule of the runs. In the local-transit industry in metropolitan areas the demand for transportation tends to peak very markedly at a morning and evening rush hour; these peaks are further apart (ten hours or more in many cases) than the scheduled work day. Management would probably prefer to provide for these peaks by runs which involved a period of compensated work and then an unpaid lapse of three or four hours with a second period of compensated work. In countries where the working population returns home during a prolonged lunch period, particularly in southern Europe, the peak periods may be expected to be different in

magnitude and number. The desires of the workers for a regular work day conflict with the need to schedule shorter runs to man the peak periods without substantial periods of stand-by compensation. The scheduling rules in local-transit operations may specify a minimum proportion of the total number of runs that are to be straight runs of continuous compensation and a minimum proportion that can be broken into two or more pieces, in which event the rules are likely to specify the outside elapsed time between the start of the first piece of work and the end of the last piece. In view of the wide differences in the desirability of these working periods and differences in preferences among workers, the rules typically provide criteria for the allocation of runs among workers and for the periodic review of these assignments or choices. In an industry where traffic or weather may slow the completion of runs on schedule, the rules are likely to be elaborate regarding overtime compensation and rates for work performed outside of the daily schedule, the allowed elapsed spread, or weekly scheduled hours.

In continuous-process industries the rules specify the criteria of allocation of workers among operations that may be on fixed shifts and the rotation principles used for workers and managers on rotating shifts, turns, watches, or other terms used to designate a regular daily work period. On late shifts special problems may arise regarding the provision of meals. Night work may also confront rules and regulations, some developed by the governmental actor, regarding the employment of women or employees below certain ages.

In some work places the question becomes urgent as to the place workers shall be expected to be at the start of the scheduled workday. In coal mines portal-to-portal or bank-to-bank rules relate to whether the working day begins when miners have reached the working mine face, an entrance to the shaft, the cage, or some other check-in point on the mine property. In other types of operations in which locale of the work place changes, such as lumbering and some construction, the issue arises whether the work day shall be construed to start at some central check-in point or closer to the place of actual work operations. In many industries the rules specify whether the work day shall include time for changing to work clothing, where specialized apparel is required, and whether time shall be allowed for cleaning and washing, where operations are dirty or hazardous.

The hours of operation of the work place mold the structure of the hierarchies in important respects. A continuous operation, for example, requires parallel levels in the hierarchies for each shift; it divides both management and workers into shift groups. It makes difficult simultaneous meetings of all workers and management personnel on account of operations always in process. It imposes additional problems of coordination among parts in each hierarchy; it becomes necessary to secure

information, to establish uniformities, to make provision for emergencies in each time zone of operations and to make arrangements for transferring workers and supervision among shifts.

The change in the hours of operation of the work place, like all other features of the technical context, is to be seen as a dynamic element that leads to changes in the complex of rules when varied. In the case of a change of hours, a distinction is to be made between those changes within a given set of rules (such as the weekly variation in the amount of overtime) and a change in the rules governing the standard working day of the work place or a change involving new shifts or new methods of allocating workers among shifts. A change in the standard working day may have significant repercussions on the rules fixing the levels of compensation. The introduction of a new shift may raise the issues of the criteria for the allocation of workers among shifts, rates of premium compensation, as well as the hours of the new shift. A new group of rules arises and old rules may be altered by a change in the standard hours of operation of the work place.

IMPACT OF ACTORS ON ORGANIZATION

While the major interest of the preceding discussion has been to show the impact of the technical context of the work place on the substance of the rules developed by an industrial relations system, there has been more limited reference to the impact of the technical context on the structure and organization of the hierarchies of the actors and their interaction. These latter points may be fruitfully pulled together at this juncture.

The characteristics of the work place itself—fixed or variable in locale, its relation to workers' residences, the stability of the work place and work force, and the size of the work group—tend to establish, or at least to set limits to, many features of the hierarchies of workers and managers. The geographical spread of the organizations, the variability or permanence in their operations, the number and location of tiers in the hierarchies, their scale of operations at a single work place, and many features of the internal communications systems must be adapted to these facets of the work place. The operations performed at the work place—the job content, the orientation toward machines or customers, and the hours of scheduled operation—also tend to influence the hierarchies of workers and managers.

A variety of specialized organizations, committees, and staff is required to cope with problems presented by the different operations. A high degree of danger creates safety committees and may introduce professional engineers in this area; a high degree of skill tends to develop

apprenticeship programs and other instrumentalities for training; the introduction of shift work develops some parallel organizations to cope with the spread of operations through time, and the handling of money tends to require specialized reporting procedures and investigating methods to check upon honesty.

There is no contention here that a few technical conditions rigidly or precisely determine every organization form; there are some differences in organization among actors confronted by similar technical contexts and other facets than the technical features of the context also play a role. But many features of an organizational configuration are narrowly constrained by the particular technical context.

The technical context also has a good deal to do with the nature of the interaction between the actors; the concern here is much broader than the sole question of industrial peace or warfare. The technical conditions influence the points of contacts between the hierarchies, whether their interactions are geographically widely spread and diffused or more concentrated and whether large or small groups are involved. The nature of supervision varies in its detail with skilled labor who direct tools and equipment and with a mobile work place as in transportation as compared to semiskilled groups in one fixed work place who are machine paced. The importance of organizing ability in management is greater where the place of work changes frequently and new organizations and relationships must be created afresh. The internal solidarity of workers is affected by the isolation of the work place, its relationship to residence, and the homogeneity of skill.

The technical context also shapes the relations among the actors by indicating the extent of the power of strategic groups of workers to shut down an operation or enterprise. The capacity of a management organization to resist shutdown by being able to replace workers or by operating with supervisory and managerial personnel for short periods is often directly related to technical processes and their vulnerability to shutdown at strategic points. A highly technical work operation with considerable managerial personnel and highly automatic processes may have a high resistance to shutdown. The technical conditions also indicate whether sudden shutdowns without adequate precautions may involve substantial damage to plant and equipment as in the freezing of aluminum pots or glass furnaces. The capacity to shut down operations, or to resist shutdowns, by the withdrawal of strategic services is highly dependent upon the technical context. These relative capacities are factors that shape the relations between workers and managers or at least decisively influence their strategies in any conflict over the rules of the industrial relations system.

The technical characteristics of the work place frequently are a major

determinant of the extent of public interest and governmental role in an industrial relations system. The operation of public transportation is of wide concern and particularly vital to the life of an interdependent industrial society. The technical vulnerability of the continuous operations in a gaseous diffusion plant in the atomic energy field provides an occasion for a special role for governmental agencies. The power to destroy major assets of a community by flooding a coal mine may call for drastic type of action by government. Some technical characteristics of a work place are significant to defining public interest and help to ascribe the role of governmental agencies.

The technical context is one of three environmental features of an industrial relations system. The technical context defines the type of work place and the operations and functions of workers and managers and to some degree influences the role of specialized governmental agencies. The following facets of technical contexts were particularly distinguished: (1) fixed or variable work place, (2) relation of work place to residence, (3) stable or variable work force and operations, (4) size of the work group, (5) job content, (6) relation to machines or customers, and (7) the scheduled hours and shifts of the work place. Some of these facets are interrelated with the economic context and not determined by purely technical factors alone. The technical context is decisive both to the substantive rules established for the work place in the industrial relations system and to the organizational configuration and the interaction of the actors.