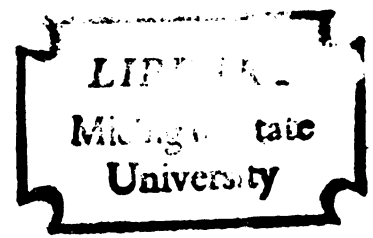


INTERACTION NETWORKS AND
INDUSTRIAL EFFICIENCY IN
PIPELINE CONSTRUCTION

Thesis for the Degree of Ph. D.
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This is to certify that the
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ABSTRACT

INTERACTION NETWORKS AND INDUSTRIAL EFFICIENCY IN PIPELINE CONSTRUCTION

By Bennie Dwane Graves

This thesis reports an observational study of recruiting and skill training in the pipeline construction industry. The study attempted to determine the extent to which the particularism of kinship and friendship and the universalism of industrial efficiency reinforce or disrupt one another.

The writer collected data through participant observation and interviews. He worked for eleven months as a skilled and unskilled laborer for two construction companies in Texas. He interviewed workers and officials of three companies at offices and construction sites in Ohio, Michigan, and Ontario. Workers were interviewed at all skill and authority levels. The interviews were designed to discover good informants rather than to get a cross section of pipeline opinion.

The organization of the industry encourages unofficial recruiting. Few contracted jobs last longer than three or four weeks. Rarely can a company hold a crew from

one project to the next. The company would lose most of its crew even if it lost no time between projects because it cannot make use of a full crew throughout a single project. Great distances between jobs usually prevents the company's beginning one job before ending another. The construction season creates a curvilinear need for workers from a constant labor force. At the beginning and end of the season fewer jobs are available than workers. In mid-season there are more jobs than workers to fill them.

Personnel offices, labor unions, and employment agencies have been unable to distribute workers from such a fluid labor force with the necessary speed and efficiency. The small contracting firm which operates with little capital is especially dependent upon a ready labor force. These companies often rent expensive equipment. Consequently, once the job is started the contractor must be able to muster a crew within a very short time.

The foregoing conditions act to encourage unofficial recruiting practices. The pipeline labor force seems to be organized around kinship and friendship groups which act as very efficient occupational contact networks. It is these networks that distribute and redistribute the labor force throughout the season.

The networks originate in kinship obligations and friendship relations but their persistence seems to be due

neither to institutional kinship norms nor to continued friendship. Rather, they seem to persist because of their functional significance to companies seeking crews and to workers seeking jobs. Once the networks become established, they seem to become more and more organized around the exchange of favors related to employment and less and less around sentiment. Established networks are able to function despite interpersonal indifference and even antipathy.

The worker's ability to get what he wants from the industry depends upon his participation in the networks. Workers use the networks to get jobs which are not far apart, jobs of the longest duration possible, as much overtime as possible, and to stretch the season as much as possible.

The construction supervisor's involvement in the networks insures him a ready crew during mid-season when he may have to ask workers to work as a favor to him. His involvement in the networks also underpins his authority by giving him the ability to reward and punish beyond a particular project. The supervisor also is able to use loyalty to himself in the service of his company. He needs these loyalties in his competition with other companies for workers, his disputes with unions, and his occasional work related illegal acts.

Despite kinship and friendship based recruiting, objective work standards seem to be maintained. The shipping

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company, through its inspectors insist upon minimum quality standards of workmanship, and construction company officials guard against costly ineptitude. Nepotistic placements are channeled into particular tasks which do not require much skill. The relatively inept kinsman or friend can be kept employed as a laborer while he learns a skill.

INTERACTION NETWORKS AND INDUSTRIAL
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By

Bennie Dwane Graves

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CHAPTER I

INTRODUCTION

This thesis reports an observational study of the role of informal recruiting and training in adjusting the pipeline labor force to the needs of the pipeline construction industry. The study has sought to discover the patterns whereby the members of the pipeline construction labor force are distributed and redistributed throughout the season among the several construction companies. A second, and related, concern derives from the fact that the informal recruiting and training in the industry are organized around kin ties and friendships, and as such, they are characterized by particularistic relations among workers. The work itself, on the other hand, is governed by universalistic standards of competence. The second question, then, is how do the construction companies get the degree of technical competence they need when they are dependent for a labor force upon the particularism of kin ties and friendship?

Primary Groups and Pipeline Construction

The pipeline construction industry seems to provide an ideal setting for an investigation of the functional relationship between the universalistic demands of a modern

industry and the particularism of kin ties, friendships, and other unofficial relationships. Groups of workers consisting of from two to twenty individuals who are kin to one another often work for the same contracting company. Moreover, the industry can make little use of formal recruiting agencies. The shortness of contracts and discontinuous needs for skilled workers present construction firms with the recurring problem of bringing men and equipment together within a matter of hours, to work for a few days or a few weeks. Correct timing of recruitment is necessarily precise. Contracting companies often use rented equipment at high hourly and daily rates, and transmission companies exact penalties for lost time. Crews, about half of which are highly skilled, must be recruited within a few hours--a few days at the most. Neither public and private employment agencies nor unions can supply crews from such a fluid labor force. Groups of kinsmen and friends, however, amass crews rapidly and effectively. Steady employment requires much movement among companies. Kinship and friendship based communication networks, unofficially organized into what Katz called "occupational contact networks," keeps workers informed about opportunities.¹ Thus, the networks serve the double function of furnishing crews to contracting companies, and furnishing workers with a maximum number of job opportunities during the construction season.

Theoretically we may expect that kin ties, together with less apparent primary relationships, and the requirements of industrial efficiency may conflict with each other. But, two general conclusions have been drawn regarding primary relations and production needs of contracting companies: (1) companies and the primary groups contribute to, rather than detract from, each other's survival, and (2) particularistic threat to industrial efficiency is reduced by patterns of recruiting and apprenticeship which permit the "boss" (the person at the center of possible conflict) to fulfill all of his obligations with a minimum of "role strain" and "role conflict."²

Role strain, for the construction supervisor, is his awareness that his official duties are difficult to perform because relatives and friends expect special work related favors from him, or his feeling that being a good friend or a proper relative are comprised by his job. Role conflict, a similar concept, applies when the supervisor views both the kinship-friendship expectations and the official expectations as legitimate but in conflict with one another. The supervisor's obligations to kinsmen and to friends are a variety of particularism. That is, the obligations derive from the relationships themselves. His official obligations are a variety of universalism in which he is expected to treat workers in terms of objective criteria of competence.

Pipeline Ownership and Construction

The pipeline industry is at present one of the larger but less visible industries in the United States.³ And, it is becoming increasingly important throughout the world.⁴ Pipelines now transport 30 percent of the total tonnage of land freight shipped within the United States. The United States is the leader in pipeline mileage, with slightly over 1,000,000 miles, followed in order by Western Europe, the Soviet Union, and the Middle East.*⁵

In the United States, pipelines are almost everywhere, but the greatest concentration of lines is found in a broad belt which runs diagonally from the American Southwest into the Midwest and to the Northeastern Seaboard. The southern boundaries of the belt are marked roughly by Albuquerque, New Mexico, and the easternmost part of Louisiana. The northern boundaries are marked by Chicago and New York City.⁶

Pipelines have proven to be an inexpensive means of transportation. Their initial cost and their maintenance are considerably less than the costs of railroads. The average cost of transporting liquids by pipeline is about

*The Middle East actually produces more petroleum than do Western Europe and the Soviet Union. However, most of the Middle Eastern petroleum is exported and consequently the area lacks the spiderwebbing of "spurs" and "loops" which characterize the pipeline systems of petroleum consuming nations such as the United States.

one half that of transporting the same liquid by rail. Pipelines transport a variety of products, the largest of which is natural gas. The natural gas industry itself is the sixth largest industry in the United States.⁷ Crude oil and its products--gasoline, diesel, and other fuel oils make up a large portion of the total freight shipped by the pipelines. Numerous pipelines, called products lines, carry a variety of liquids on a contract basis. They ship one liquid or gas behind another.⁸ Of lesser but growing importance are recent technical innovations which permit pipelines to ship a variety of products other than gas and petroleum. A Colorado company ships asphalt over a distance of more than two hundred miles. Another Colorado company ships coal simply by mixing it with water. Wood chips for pulp factories, and even automobile parts, are shipped through pipelines in southern Canada. The automobile parts and other solids are put into cylindrical or spherical containers, and the containers are then put into some kind of liquid medium. Molten sulfur is transported from offshore wells to the Louisiana coast in pipelines which are built on the principle of the vacuum bottle.⁹

Most of the pipelines are owned by petroleum, public utility, and independent pipeline companies. Pipeline construction is done by some of the companies which own the lines, by companies which are semi-independent parts of pipeline owning companies, and by independent contracting

companies. The greatest number of construction companies are independently owned. These range in size from very large corporations to one owner subcontracting companies. Pipeline shipping companies that own their own construction equipment actually do a very small part of their own construction. The industry is organized in such a way that construction contracts ordinarily can be awarded to outside construction companies more cheaply than the construction can be done by the pipeline company itself. The semi-independent companies are financed by parent petroleum companies, but they have their own boards of directors and accept contracts from other companies.¹⁰

The actual size of construction companies is difficult to determine. The largest companies ordinarily do several kinds of construction work. They may drill and repair oil wells, build roads, highways, dams, hotels, and a variety of other structures. Often they operate heavy equipment rental services for smaller companies. Even if a company just builds pipelines the flexible size of its staff and crews makes the definition of size uncertain. The smaller companies that build only pipelines may start each season with only the owner, a bookkeeper (who often is the owner's wife) and a construction superintendent. The company may own little more than a few pickup trucks and a "grease wagon." By the middle of the season, the same company may have from one hundred to two hundred workers, and it will

have rented enough equipment to keep them busy. As the season comes to a close in early winter, the company's staff will again shrink to two or three people and little equipment. Even large companies that own most of their own equipment and hire a full time office staff may start and end each pipeline season with a pipeline crew consisting of a general superintendent and a bookkeeper. Yet, in mid-season, the company's crews may swell to more than a thousand men.

Despite the rubber sheet flexibility of all construction companies, some determination of relative size can be made. The largest companies often have jobs in progress throughout the world. They own their own equipment and maintain operations centers in the United States, Canada, and the Middle East. Their staffs often include vice presidents for purchasing, contracting, and other divisions of the company. The larger companies seem rarely to accept other than prime contracts. They frequently subcontract portions of jobs to smaller companies.

Smaller companies may be viewed as those which (1) accept both prime and subcontracts, and (2) which operate at least one full "spread." (A "spread" is the organization of enough men and equipment to build a pipeline.) The smaller companies generally confine their operations to the nine to ten month construction season in the United States and Canada. These companies often own little equipment. Consequently they lease most of the equipment they use.

Numerous other companies accept only subcontracts, and they do not ordinarily operate a full spread. Rather, they complete specific tasks such as road crossings, and make connections to pump stations, refineries, and gas and oil fields. There seems to have been a recent proliferation of the small subcontractors--a trend corresponding to the increasing specialization within the construction industry and the increasing cost of pipelining equipment.

In order to determine the number and approximate size of companies, the writer examined the listings included in "Pipeline Work in Progress" in Pipeline Construction for June, July, and August, 1966.¹¹ The listings cover a reporting period from June 10 through August 10, 1966. The listings are limited to companies working on prime contracts during the reporting period. Unfortunately, the listings include only smaller than spread size companies which have been awarded subcontracts. Companies that had accepted subcontracts for an entire segment of line were not included in the listings. The June, July, and August issues of Pipeline Construction were selected because the reporting period covers the heaviest part of the construction season. The three summer issues of the journal listed active contracts for a total of 107 different prime contracting companies at least once. The June issue listed 77 (72%) of the 107 companies; the July issue listed 75 (70%), and the August issue listed 70 (65%).

The best apparent indexes of company size are (1) the amount of mileage under prime contract to a construction company, (2) the number of simultaneous prime contracts awarded to a construction company, and (3) the number of subcontracts awarded by the prime contracting firm.* Pipe diameter is only slightly related to company size. Although some of the larger companies accept contracts only for certain ranges of pipe diameter, the smaller companies seem to contract work involving all pipe sizes. The large companies own their equipment, and it is designed and outfitted to deal with a particular range of pipe diameters. The small contracting companies enjoy greater pipe size flexibility because they simply rent whatever equipment a particular contract demands.

The typical contract is awarded to a one contract company, to lay less than ten miles of large diameter pipe. Sixty-six of the 107 companies operating at some time during the 1966 season worked on only one contract at a time. Thirty-one companies had two contracts listed for overlapping periods. One hundred nineteen subcontracts were awarded by Prime contractors during the reporting period covered in the three issues of Pipeline Construction. Most of the subcontracts were awarded for the completion of special jobs,

*These criteria apply only to the "heavy (summer) season." This is the period in which most existing companies can be expected to have active contracts.

but at least a few subcontracting companies known to the observer, but not reported, operated complete crews and were responsible for all of the tasks on a portion of the line. Some subcontracts for special jobs known to the observer were awarded too late to be included in the Pipeline Construction listings.

Only the larger companies can handle jobs involving more than 100 miles. Large contracts require access to equipment which small companies do not have--either because they do not own the equipment, or their credit is not good enough to rent it. Moreover, the contracts usually contain a time limit clause. Consequently the contractor often must be able to operate several spreads. Only twelve of the 107 companies had contracts for more than one hundred miles and only fourteen more had contracts requiring the construction of from ten to fifty miles. The typical 1966 contract (mode) was awarded to 77 companies to build less than ten miles of pipeline each.

The construction companies are located along the large belt of pipelines described earlier. The largest concentration of home offices is found in the American Southwest. Texas is the conspicuous leader with 32 of the 107 listed companies. Louisiana and Oklahoma were represented by four companies each. The remaining companies are spread over the midwestern, southern, and southwestern states.

The Labor Force

The pipeline labor force seems to come predominantly from the American Southwest. Although it has been impossible to determine the proportion of workers with respect to regional origins, the southwest has left its cultural stamp on the industry. Even the workers who were born and raised in the Midwest and in Canada use a pipeline vocabulary which originated in Southwestern farm and ranch life. Most of the pipeliners contacted on Midwestern jobs by the writer were "up here from Texas," "from Louisiana," or from somewhere else "down home."

The typical pipeliner seems to be a white Anglo-American southwesterner. He has a rural background, and his "folks" were farmers or farm laborers. Several factors seem to have combined to determine the regional and social composition of the pipeline labor force. The uprooting effects of the dust bowl and the depression of the 1930's created a large migrating population. Many pipeliners who are now over fifty years old have had some experience in the "cotton, broom corn, and grain sorghum harvest circuit" in New Mexico, Oklahoma, and Texas before they became pipeliners. Others traveled north through the wheat belt and to south Texas and to northwestern Colorado to fruit harvest. When pipelining began to demand a large labor force during and after World War II, many migratory farm workers were available, and they had learned to live "on the go." Increasingly efficient farm

technology and decreasing profits since World War II have displaced many farm owners and renters, and the resulting decline of the family farm and the rapidly diminishing need for unskilled farm workers has occurred simultaneously with a rapid expansion of the need for pipeliners. There are then, perhaps, two fairly similar populations in the pipeline labor force: the "old timers" whose neighbors and kinsmen went west to California first to pick fruit, and later to work in defense plants, and a younger group which, had it not been for pipelining, might have migrated to the West Coast or to midwestern urban centers.¹²

Pipeline crews are conspicuously white. The writer has seen perhaps over a thousand pipeliners on jobs. No more than a dozen of these have been Negroes. And, with one exception, these few individuals were "common hands" (unskilled workers). One Negro "common hand" was made "straw boss" for a few hours over a gang of Negroes hired to clean ditches. Workers whose ethnic origins are Mexican American and Spanish American (in New Mexico) are seen more frequently, but not nearly in the same proportions as they are found in the population, and they too are rarely found in supervisory positions.

The white Anglo-American workers have been able to restrict skilled jobs to themselves primarily because workers themselves largely control skill learning in the industry. Loos reports that in 1910 both Negro and white pipeline crews

worked for the Interstate Oil Pipeline Company. Except for joining the lengths of pipe, which was done by whites, the segregated crews did the same kinds of work although white foremen supervised the Negro crews.¹³ Since these early crews did not need the more complicated skills of the mid-century pipeliner, their employment was in the hands of the company. Modern skill training, and therefore induction into the industry, is informal. The contemporary trainee is dependent upon friends and kinsmen to instruct him and to supervise his initial attempts to practice his newly acquired skill. Consequently, white workers seem to have attained more control over the ethnic composition of the industry than they had over the composition of the farm labor force. Despite gross economic disadvantages, minority groups in the Southwest did have minor advantages in seeking manual farm work. For one thing, Negroes and Mexican Americans could be hired more cheaply and they were more controllable. The writer recalls that in the summer of 1940 the customary wages for chopping cotton in west Texas were ten cents per hour for white men, and seven and one-half cents per hour for white women, white adolescents, and Negro men.* For several years during and after World War II, Mexican Nationals

*These rates seem to have been based not upon any assumption about the worth of work done by members of the different categories, but rather the belief that white grown men needed better pay.

(Braceros) were paid twenty-five to fifty cents per hour to chop cotton.

Research Procedures

Data were collected in three ways. The writer worked in the southwestern states as a laborer during the summer of 1951 and through most of the construction season of 1953. Following that period he made occasional contacts with pipeliners in the Southwest and Midwest. From June, 1966, through May, 1967, the writer visited the construction sites of three companies and company offices in Ohio, Michigan, and Ontario, where he interviewed workers and company officials. Observations during the latter period were made in three companies, all of different sizes. Workers were interviewed at all skill and authority levels. The writer did not draw a random sample of workers from the elusive labor force. Rather, pipeliners who were interviewed were viewed as informants. Convenience governed the selection of companies in which the writer made his observations. The two Texas companies are best described as two-contract companies. That is, they rarely had more than two contracts at any one time. Two of the Ohio and Michigan companies were much larger; one was smaller. The large companies were capable of, and had carried on, four large simultaneous contracts. The two smaller Texas companies seem, however, to have been more typical of the kinds of companies that accept contracts

to do pipeline work. The small companies rented some of the equipment which they used, and their permanent staffs amounted to two or three people. Few companies are larger than one of the south-central Michigan companies although a few, such as the Bechtel Corporation of Houston is vastly larger. The writer interviewed workers and supervisors in one company which specialized in housing development "tie ins" in central Michigan.

The representativeness of companies selected for their convenience is uncertain. But independent of size, all of the companies are similar in some ways most relevant for the present study. (1) Regardless of size, each of the companies accept more contracts for short term than for long term jobs. (2) The size of a "spread" (full crew) is governed by pipe diameter and topography, not by the size of the contracting company. (3) Even when long term jobs are contracted the construction company usually operates several spreads in order to meet contract deadlines. Thus, at the actual work level the situation for workers apparently is identical in all companies. Most of the pipeliners known by the writer have worked in all sizes of companies, and whether a company is large or small seems to be a matter of general indifference to the workers. Moreover, the recruiting problems for all of the companies in which the writer made observations seem to have been identical. That is, they are

required to recruit almost completely new crews for each, usually short, contract.

The writer carried out his most intense research efforts in the summer of 1966 in the two Michigan and one Ohio companies. He interviewed the president, the vice president of the pipeline division, the personnel manager, and the general construction superintendent in the large company, and all three of the officials in the specialized company. The interviews were designed to get information about crew recruiting. Approximately two hundred workers and gang supervisors were contacted. About 120 of these contacts can be described as interviews. An interview is defined here as a focused conversation which probably both the interviewer and the interviewee would define as an interview. The definition excludes situations such as "bull sessions" in which the observer often was an attentive and grateful bystander. Bull sessions frequently proved to be more fruitful than focused interviews.

No claim can be made for the representativeness of the interviewed subjects. Indeed the main purpose of the formal interview was to discover good informants. And good informants are atypical, not typical pipeliners. Out of the approximately 120 interviews, the writer selected and spent most of his time with nine workers. One of these was a general construction superintendent, two were inspectors, four were gang foremen, one was a welder, and one was an

x-ray subcontractor. These individuals were selected from the rest because: (1) They seemed to have a large store of information, and they exhibited what the writer considered, on the basis of his own experience as a pipeliner, to be good insight into the socio-cultural characteristics of the industry. (2) They were articulate and cooperative, and they had thought objectively about pipelining as a way of life. Although idle curiosity has not achieved the stature on the pipeline that it has achieved in universities, the industry contains individuals who observe and ponder the behavior of their fellow men "just for the hell of it." Although the student of social science has to interpret and evaluate informant reports, such individuals are very valuable sources of information and working hypotheses. (3) Finally, the selected individuals were quick to comprehend the writer's clumsily stated objectives and they became interested in the inquiry.

The writer has not viewed the use of unrepresentative informants as especially inferior to a randomly drawn sample of workers. Many of the subtleties of organization do not lend themselves to survey techniques. The opinions of numerous workers (for example, the belief of some that they taught themselves complicated pipeline skills) would indicate only that many workers are innocent of interpersonal insights. Ethnologists have used carefully selected informants for decades without apology.¹⁴

Conceptualization

The study has attempted to explore the problem of labor force industry adjustment on three levels of analysis: the structural, the interpersonal, and the individual (motivational).

The structural level, applied to pipelining, includes (1) the organization of the industry--the formal relationships among pipeline companies, construction contracting companies, and labor unions, (2) the organization of contracting companies and subcontracting companies, and (3) the social and technical organization of pipeline construction work, the "spread." The interpersonal level of analysis is concerned with concrete patterns of interaction found among workers acting within the context of the pipeline construction industry. Analysis of interpersonal patterns takes into account the work related motives of workers within the nexus of the various structures in which interpersonal behavior takes place.¹⁵ "Motive," as the term is used in this thesis, refers to phenomenological preferences regarding work.

The principal effort in the present project has focused upon the interpersonal level of analysis and upon the organizational patterns which seem to emerge from this level. The most important of these are (1) groups of kinsmen formed on an ad hoc rather than an institutional basis,

(2) friendship cliques whose relationship is relevant for labor force movement, and (3) contact networks of pairs of individuals who exchange job related favors but who, unlike kin groups and cliques, do not constitute social groups.¹⁶ The emergent kin groups and cliques within the labor force are characterized by affective involvement of members and particularistic and diffuse obligations among members. The dyadic networks are characterized by particularistic obligations, but not by affectivity, nor by diffuse obligations.

The fitting of the pipeline labor force to the industry has two dimensions: the adaptive and the integrative. The principal adaptive questions are: How do workers with the appropriate skills become distributed among the construction firms in roughly the correct proportions, and how do workers and groups of workers go about achieving their explicit objectives? The principal integrative question is: How are the particularism of kinship and friendship and the universalism of pipeline technology articulated in such a way that they do not disrupt one another?

The adaptive dimension of labor force adjustment to the industry is especially important in pipeline construction because of the peculiar time and distance characteristics of the industry. Short contracts and long distances between contracts makes virtually impossible any formalized company or labor union recruiting procedure. These time and distance characteristics of the industry foster informal recruiting

and skill training. Patterns of crew recruiting, job finding, and the longer range patterns of apprenticeship in the industry seem to be most understandable when they are viewed in terms of the constantly recurring need to recruit crews and find jobs.

The integrative dimension of labor force, industry adjustment, is perhaps more important in pipelining than in other industries because of contracting company dependence upon particularistic communications channels to distribute the labor force. Inherent in these conditions is the opportunity for particularistic exploitation of job vacancies to the detriment of official production goals. Kin ties and friendships among pipeliners are governed in most contexts by particularistic expectations, that is, by expectations based upon the kinship or friendship tie itself. Even after the friendship has "cooled" or even become hostile, any surviving remnant of the relationship is likely to continue to be particularistic. These latter "other directed friendships" are instrumental rather than expressive.

The nondisruptive integration of particularistic and universalistic expectations in pipeline construction seems to result from some of the characteristics of recruiting, selective placement on the job, and the apprenticeship system. The crew formation and skill training processes are particularistic, yet the particularism seems to be channeled into productive work which is minimally threatening to

production standards. The nondisruptive channeling of particularism means that workers hired on a particularistic basis seem not to interfere seriously with the technical requirements of the industry. Rather, inept workers are placed in jobs they can do, and workers are hired in such a way that more skilled workers can continue to believe that "skill pays off." These channeling practices, taken together, may be described as "controlled particularism."

Controlled particularism, as the term is used here, denotes special kinds of relationships among at least three classes of pipeline workers, and the functional consequences of these relationships. The individuals involved in the relationship are (1) an aid recipient whose claim to aid is particularistic, (2) a strategically located person (usually a supervisor) who is able to give aid on a particularistic basis, and (3) third parties who have a legitimate interest in the aid transaction (the supervisor's "role set").¹⁷ The aid recipient in pipelining usually is an untrained person. But near the beginning and end of the season, when there are more workers than jobs, the aid recipient may be a highly skilled person. The highly skilled person can be viewed as an aid recipient if his unofficial relationship to the hiring supervisor influences the hiring.

It is convenient to examine the problem of integration from the point of view of construction supervisors. "Bosses" who actually do the hiring are especially important

in the study. Their positions expose them to expectations based both upon kin-friend relationships and upon production criteria. The boss who hires workers necessarily faces the problem of placing friends and kinsmen, satisfying the contractor and the shipping company inspectors, and assuring skilled workers that their skills form the basis for hiring. Inspectors representing public utility and petroleum companies demand high quality work. The construction companies want the work done efficiently and speedily. Skilled workers expect their competence to be recognized and rewarded with first choice of good jobs. Supervisors, inspectors, contractors, and workers themselves generally enforce universalistic standards, despite the fact that they often consent to the bosses' particularistic worker placements. Workers make little distinction between the preferential hiring of kinsmen and of friends. Both actions are viewed as favoritism, sometimes approved and sometimes not.

The pipeliners, making up the boss's role set, have sanctions available to them to enforce their demands. Sanctions available to shipping company inspectors, contractors, and skilled workers in their dealings with supervisors are fairly clear. The contractor can reprimand or fire the boss. The inspector can require that work be redone, and skilled workers can boycott, strike, or refuse to take a particular job. Sanctions available to friends and

kinsmen are more subtle. They consist largely of withholding favors from bosses.

The pipeline labor force is distributed and redistributed throughout the season because: (1) strategically located persons give particularistic aid, (2) most pipeliners, at sometime during the season, seek such aid, and (3) because the aid giver ordinarily receives implicit consent from most or all of the people who have a legitimate interest in the transaction. The system works because the three classes of principals expect to get something out of the transaction. The aid recipient, of course, receives preferential treatment. The aid giver obligates the recipient so that the recipient owes him particularistic aid for the future. The members of the aid giver's role set, by their consent, either return favors or they obligate both giver and receiver. Hence, the entire transaction is imbedded in a complicated exchange system which workers exploit in order to increase the amount of overtime they may work, and the probability that they can remain employed fairly continually for the longest possible amount of time during the season. Supervisors increase the likelihood that they can find crews during periods of worker shortages.

The thesis argues, then, that the networks function first of all to move the labor force, and second, that they function to reduce the likelihood of conflict between the particularistic practices inherent in crew formation and

training and the technical requirements of the industry. This is not to say that such conflict never occurs. It does, and its occasional occurrence is taken as evidence of the potential strain between the two sets of standards. Both workers and supervisors assume that wholesale favoritism is likely to be costly, and no aid recipient has an unlimited claim to aid. Supervisors have reputations as "fair" or "unfair," and these reputations depend upon their skills in choosing occasions in which it is safe to favor exchange reciprocals directly, and when it is not. In short, "perfect integration" is too simple a formulation. The foreman who has a number of particularistic obligations often finds ways to give aid other than placing a worker directly under himself. And sometimes he is unable to give aid at all.

The networks, once they become established on the basis of exchanges among kinsmen and among friends, often eventually center more and more exclusively around job finding and recruiting. No matter what the interpersonal history of networks as groups, they seem to survive not because individuals are kin to one another or like one another, but because the networks function to enhance the pipeliner's career and to furnish workers rapidly for the companies. Because of this trend, the writer has found the concept of "exchange to be useful. Exchange among pipeliners has been viewed as a form of rational self interest in which favors

with ultimate cash values are traded among groups and individuals.

Relevant Trends in Contemporary
Social Science

The present investigation has been viewed as an attempt to understand the character of the relations between informal and formal organization in the pipeline construction industry. The investigation has been stimulated by two broad trends within American social science: the study of the relationship between industrialism and kinship, and the study of informal organization within industry. Recently investigators have suggested that kin ties and industrialism may not be as incompatible as was thought earlier. And the concept of informal organization has been broadened to include more than organized worker opposition to management objectives. Litwack examined several empirical studies and concluded that continued kin relations beyond the nuclear conjugal family survive extensively in contemporary American society despite the impersonal requirements of industry.¹⁸ Historical and crosscultural studies, moreover, indicate the persistence of similar kin relations in various stages (or varieties) of industrialization. The network of relationships among Japanese factory workers and lumbermen, for example, seems to be governed as extensively by kinship as by production standards.¹⁹

The Western Electric studies increased interest in informal groups in industry.²⁰ Attention since, however, has been focused largely on the ability of such groups to subvert industrial goals. Nevertheless, primary groups other than kinship seem to act as recruiting agencies for manufacturing, construction work, business, government, the military, and the professions.²¹ Warner, in a study of top management in large American corporations describes "national primary groups" which serve similar functions.²² A few of these studies have analyzed the efficiency consequences of such recruiting practices and have found them to aid rather than hinder production. For example, interpersonal relationships among Detroit building craftsmen seem to lend stability (i.e., labor force predictability) to the city's building industry.²³ And, although it is mildly deplored, faculty inbreeding at The University of Texas helps to maintain departmental continuity.²⁴

Finally, an important but largely unexplored question remains. How are the impersonal demands of industry and the requirements of kinship and other extra official organizations integrated in such a way that they do not disrupt one another? Nepotism can, and often does, result in incompetence and failure. Friendships within organizations and other forms of informal organization frequently do create loyalties and goals which subvert industrial objectives. The significant research problem is then, to discover the

conditions under which kinship, friendship, and other kinds of particularistic relationships and formal industrial organization either support or disrupt one another.

Groups of kinsmen are not ordinarily described by social scientists as informal groups. The present writer, however, has viewed the groups of kinsmen ("bunches") in the pipeline construction industry as informal groups because of their ad hoc formation. The formation of bunches is due as much to the time and distance factors in the industry as to extra-industry kin ties.

FOOTNOTES

¹Fred E. Katz, "Occupational Contact Networks," in Sigmund Nosow and William H. Form (eds.), Man, Work and Society: A Reader in the Sociology of Occupations (New York: Basic Books, Inc., 1962), pp. 317-21.

²The phenomena of "role strain" and "role conflict" have been explored in a variety of settings. The most extensive investigations are reported in:

Neal Gross, Ward S. Mason, and Alexander McEachern, Explorations in Role Analysis: Studies of the School Superintendency Role (New York: John Wiley and Sons, Inc., 1957).

Robert L. Kahn, et al., Organizational Stress: Studies in Role Conflict and Ambiguity (New York: John Wiley and Sons, Inc., 1964).

³R. J. Rutherford, "The First 150 Years Were the Easiest," Pipeline Industry, 24, No. 6 (June, 1966), 24.

⁴George Sell, The Petroleum Industry (London: Oxford University Press, 1963).

⁵E. J. Jenson and H. S. Ellis, "Pipelines," Scientific American, 216, No. 1 (January, 1967), 64.

⁶Jenson, Scientific American, 216, No. 1, 64.

⁷Jenson, Scientific American, 216, No. 1, 62.

⁸Harold Williamson, et al., The American Petroleum Industry: The Age of Energy 1899-1959 (Evanston, Illinois: Northwestern Press, 1963), p. 102.

⁹Jenson, Scientific American, 216, No. 1, 66.

¹⁰The relationship of semi-independent and independent construction companies are discussed in:

Henrietta M. Larson and Kenneth Wiggins, History of Humble Oil and Refining Company: A Study in Industrial Growth (New York: Harper and Bros., 1959).

John L. Loos, Oil on Stream: A History of Interstate Oil Pipe Line Company, 1909-1959 (Baton Rouge: Louisiana State University Press, 1959).

¹¹"Pipeline Work in Progress," Pipeline Construction, 21, No. 7 (June, 1966), 47-55; No. 8 (July, 1966), 35-41; and No. 9 (August, 1966), 48-55.

¹²John Steinbeck, despite his penchant for sentimentality, recorded his excellent field observations of the migratory life of the dustbowlers in:

John Steinbeck, The Grapes of Wrath (The Viking Press, Inc., 1939).

Anderson describes the migratory patterns among the same group more systematically in:

Nels Anderson, Men on the Move (Chicago: The University of Chicago Press, 1940).

¹³Loos, pp. 23-24.

¹⁴Kurt W. Back, "The Well Informed Informant," Human Organization, 14, No. 4 (1956), 30-33. Reprinted in Richard N. Adams and Jack J. Preiss (eds.), Human Organization Research: Field Relations and Techniques (Homewood, Illinois: The Dorsey Press, Inc., 1960).

¹⁵Distinctions between the more formal structures and concrete social behavior have been found to be useful in both sociology and anthropology:

Delbert C. Miller and William H. Form, Industrial Sociology: The Sociology of Work Organizations (2d ed.; New York: Harper & Row, Publishers, 1964), p. 17.

Raymond Firth, Elements of Social Organization (2d ed.; Boston: Beacon Press, 1961), p. 22.

¹⁶The kin groups and cliques may be described as groups in terms of the most inclusive criteria. Especially important in these pipeline groups is group identity, norms, and goals. For a discussion of the various definitions of groups see:

Donald W. Olmsted, Social Groups, Roles, and Leadership: An Introduction to the Concepts (East Lansing, Michigan: Board of Trustees, Michigan State University, 1961).

¹⁷Merton used the concept, "role set" to describe an actor's relationships to other status incumbents which he incurs because he occupies a particular position.

Robert K. Merton, Social Theory and Social Structure (Revised and enlarged edition; Glencoe, Illinois: The Free Press, 1961), pp. 368-84.

¹⁸Eugene Litwack, "Occupational Mobility and Extended Family Cohesion," American Sociological Review, 25, No. 1 (February, 1960), 9-12.

Eugene Litwack, "The Use of Extended Family Groups in the Achievement of Social Goals: Some Policy Implications," Social Problems, VII (1959-1960), 177-187.

¹⁹James Abegglen, The Japanese Factory (Cambridge, Massachusetts: The Massachusetts Institute of Technology, 1959).

James W. Bennett and Iwao Ishino, Paternalism in the Japanese Economy: Anthropology Studies of "Oyabun-Kobun Patterns" (Minneapolis: University of Minnesota Press, 1963).

²⁰F. J. Rothlisberger and W. J. Dickson, Management and the Worker (Cambridge: The Harvard University Press, 1939).

²¹Katz, pp. 317-21.

²²W. Lloyd Warner, The Corporation in the Emergent American Society (The Ford Distinguished Lectures . . . LV; New York: Harper and Row, Publishers, 1962), p. 12.

²³Richard R. Myers, "Interpersonal Relations in the Building Industry," in Sigmund Nosow and William H. Form (eds.), Man, Work and Society: A Reader in the Sociology of Occupations (New York: Basic Books, Inc., 1962), pp. 126-36.

²⁴McGee, Reece, "Institutional Inbreeding," The American Journal of Sociology (March, 1960), pp. 483-488.

CHAPTER II

SOCIAL STRUCTURE AND INTERPERSONAL RELATIONS:

A VIEW OF ORGANIZATION

The present investigation has focused upon interpersonal relations in the pipeline construction industry. The principal problems have been to determine the extent to which informal recruiting and training patterns act as mechanisms which meet the manpower and efficiency requirements of the industry, the employment needs of workers, the economic survival needs of construction firms and the survival needs of various kinds of kinship and friendship groupings as economic units. More specifically the observer has attempted to determine (1) how contracting companies get the manpower and efficiency they require in order to survive as profit making organizations, (2) how much work workers want to do in a year's time and how they go about fulfilling their wishes, (3) what pipelining as an occupation contributes to the survival of kin groups as limited economic units and (4) what kin groups and informal networks, in their capacities as "recruiting agencies," contribute to the survival of contracting companies.

The project has been guided by a structural-functional orientation. An attempt has been made to view interpersonal relationships within the context of larger and more formal social structures. That is, the analysis proceeds from a description of the largest to the smallest structures--from relevant characteristics of the industry to the resulting interpersonal relations. The writer has assumed that attempts to understand patterns of interpersonal relations without first considering the broader structural context in which these occur could easily lead into many "interesting" but largely irrelevant phenomena. And the essential dynamic relationship of interpersonal relations to the pipeline labor force movement might be lost. Individual differences among pipeliners, aside from skill and stamina, are largely submerged even at the behavioral level. Thus, the units of analysis in order of their analysis are (a) the relevant characteristics of the industry, (b) kinship and friendship networks, (c) characteristics of contracting companies, and the "spread" (work plant), (d) labor unions, and (3) the expressed motives of workers regarding work.

The study of interpersonal relationships within the context of interacting social structures is a thread that runs through much of organizational theory. And generally, the effort has been to understand interpersonal relations following an analysis of the principal structures (or sub-structures) which are brought to bear on the participants.

The implication here is, of course, that patterns of interpersonal relationships are to be understood primarily as functions of the structures in which persons occupy positions, and only secondarily as functions of the personal characteristics of the actors. Yet, even in the most rigid of structural contexts there is room for choice, and indeed choices must be made. This leeway gives some play to interpersonal skills and to the pursuit of individual goals. The relevant goals, however, are "shaped" by, and their expression is stimulated by, organizational factors.

Since Herbert Spencer first distinguished social statics and social dynamics, much social science effort has been expended to conceptualize and study the nature and consequences of structures and substructures for one another. Thus, for decades social scientists have been concerned with "in-between" problems such as innergroup, innerethnic, and labor management relations, to mention just a few.

The "marginal man" was seen to be a product of imperfect integration (or assimilation) of two or more groups in which the marginal individual held incomplete membership. The study of leadership especially since World War II may be seen as an attempt to deal primarily with the problem of the integration of individuals within groups and the integration of groups with groups. Hence, leadership studies of the past two decades have shifted from a focus upon the personal

characteristics of leaders to the social structural occasions calling for focused decision making.¹

Informal Organization

The concept of "informal organization" represents an attempt to study integrative problems. The concept has received much attention since the publication of the results of the Western Electric studies.² Despite its continued appeal, however, "informal organization" has not been defined consistently. Informal organization, Gouldner states, is a "cafeteria concept of diverse and sprawling contents." The concept takes on varying meanings and emphasis depending upon the social scientist who writes about it.³

The Western Electric studies not only stimulated interest in informal organization, but the same studies produced a onesided view of these unofficial structures. The functions of informal organization has generally been located either in the satisfaction of personality needs which are not met by the formal organization, or to the subversion of management goals. A number of sociologists have continued both traditions. The work of Donald Roy represents the subversion tradition.⁴ Schneider gives us an example of the psychological needs model in the following description of the functions of informal organization.

The informal group is an outgrowth of, and a reaction to, industrial technology and industrial bureaucracy. It is therefore the function of the informal group to afford the worker (1) relief from

monotony, boredom and fatigue; (2) opportunities for status; (3) an increased flow of emotional responses; (4) opportunities for independence; and (5) increased security.⁵

Descriptions of the structure of informal relations, however, seems not to be as diverse as are the postulated functions. Page's structural characterization of the concept seems to be fairly representative.

Like the formal, it consists of rules, groupings, and sanctioned systems of procedure. They are informal because they are never recorded in the codes or official blueprints and because they are generated and maintained with a degree of spontaneity always lacking in the activities which make up the formal structure. These rules, groupings, and procedures do, never-the-less, form a structure, for, though not officially recognized, they are clearly and semi-permanently established, they are just as "real" and just as compelling on the membership as the elements of the official structure, and they maintain their existence and social significance throughout many changes of personnel.⁶

Recently a more general view of the functions of informal organization has emerged. A few writers have pointed out a less frequently recognized fact--that informal organization may be functional as well as dysfunctional for organizations, and that often informal organization is necessary for the operation of the organization. Miller and Form see an important source of aid to management objectives in informal organization.

Without the assistance of informal organization, formal organization would often be ineffective, as is frequently the case when managers try to determine every detail in production. They are too far removed from production to envision many of the problems that arise. Yet frequently they give orders on the basis of presumed knowledge. If their

orders were completely obeyed, confusion would result and production and morale would be lowered. . . . where strong informal groups are present, there is no need for the foreman to enforce minimum standards of work. The group will do it for him, and much more effectively.⁷

Selznick's treatment of organizations incorporates much of what has been called informal organization. Firth's distinction between social structure as ideal and social organization as behavioral includes much of what has been called informal organizations. Blau goes a step farther; he suggests that the "formal-informal" dichotomy can only be misleading . . . "since the distinction is an analytical one; there is only one actual organization."⁸ The suggestion here is that the issues raised by the concept of informal organization are the issues of organization generally. The principal problem is that of accounting for the fact that rationally planned and coordinated action proceeds successfully and predictably despite changes in personnel, broad individual differences, and the possibly non-rational extra-organizational motives of participants.

Despite conceptualization difficulties, however, the importance of the wide range of unofficial organizations is attested by the prominence of discussions of the concept in the literature of formal organization and industrial sociology. If for no other reason, the concept is valuable because it broadens the view of the observer and it sensitizes him to relevant phenomena which might otherwise be

disregarded. Indeed, the total disregard of phenomena subsumed under the concept would leave us with neatly drawn organizational charts. The concept of organization might become lost completely.

Role Set and Status Set

Merton's "role set" and "status set" formulation has stimulated a fruitful but one-sided concern with the phenomenon of role conflict. Such efforts have been one-sided because they have (1) focused upon the pathological character of role conflict and (2) the work has been largely applied research with the aim of reducing role conflict, and (3) the responses to role conflict have been viewed largely as individual responses.⁹ The possible functions of role conflict for both victims and organizations has been generally disregarded. Merton's original formulation, which postulated organizational as well as individual responses to strain, were not as narrow. The essentially creative organizational responses to potential role conflict may be creative and problem solving.

Social structures are not without powers of learned adaptations, successively transmitted through changed cultural mandates. This helps mitigate the frequency and intensity of conflict in the status-set. For the greater the frequency with which patterned conflict between the obligations of multiple statuses occurs, the more likely that new norms will evolve to govern these situations, assigning priorities of obligation. This means that each individual caught up in these stressful situations need not improvise new adjustments.¹⁰

Each of the foregoing perspectives has been useful in the present attempt to understand the articulation problems between the labor force and the industry. The concept of informal organization, although broad and variously conceived, alerts one to the potential relevance to organization of many kinds of worker activities which are not specified officially in the pipeline industry. The role-set and status-set concepts, and the resulting potential for role conflict focused the student's attention on the pressures upon foremen and other individuals who are strategically located in the industry. Indeed it was a rather serious attempt on the student's part to find manifestations of role conflict, and a failure to do so which started him on the track of studying recruiting and apprenticeship as articulating rather than subversive patterns. The leadership properties of the industry have been important. Pipeliners themselves have a strong theory of leadership and have lists of bad and good foremen and spreadmen. Indeed, the pipeline supervisor has a continuing problem of legitimizing his authority. Authority on the pipeline, like authority in other bureaucratic organizations, rests in positions. Yet the very fluid labor force of the pipeline industry makes the "indivisibility of control and consent" a more acute problem for the pipeline supervisors.¹¹ The sanctions available to the pipeline boss gives him control of workers, at least in his capacity of supervisor, only for a very short

period of time. The real power which a supervisor enjoys seems to be most explicable in terms of his official position together with his involvement in the networks which account for recruiting and apprenticeship. It is these involvements which permit him to extend his power beyond a particular job.

Worker Motivation

The view of motivation adopted for the present study is rationalistic. The method used in investigating motivation has been confined to phenomenological reports of pipeliners. Needless to say this does not represent an attempt to present a comprehensive view of motivation. The present writer does not presume to resolve such philosophical issues as rationality-nonrationality, or individualism-altruism. There is no need here to assume a position regarding the existence or nature of unconscious motivation. Nevertheless any researcher makes either implicit or explicit assumptions regarding these issues.¹² The assumption guiding the present project is that the pipeliners' behavior in the work context is coherent and predictable because they generally make visible efforts to achieve what they say they want to achieve. When their wants are known, their behavior can be predicted by an observer. The present study has, then, focused upon the expressed wishes of the workers,

supervisors, etc., regarding working conditions, travel, overtime, and other job related concerns.

Norms and Relationships

The "pattern variables" as formulated by Talcott Parsons offer a means to describe the norms bearing upon behavior within the various substructures in the pipeline construction industry.¹³ The primary concern here is with "universalistic" and "specific" expectations which ordinarily characterize production standards, and "particularistic" and "diffuse" expectations which ordinarily characterize kinship and friendship.

A universalistic expectation is one in which the relevant position incumbent is expected to behave toward others in terms of abstract laws, rules, standards of competence or general principles. The alternative of particularism is one in which the person is expected to respond to others in terms of their relationships to one another. In pipelining, the most important universalistic norms are standards of technical competence; the clearest example is a "welding test" in which the work sample of an aspiring welder is examined by highly objective techniques. Kinship and friendship relations, on the other hand, are ordinarily governed by the relationship itself. The obligations of persons to one another may be specific, in which case the obligations are confined to one or a few kinds of

relationships. The obligations are diffuse if they can be invoked in a wide range of concrete situations. Ordinarily occupational norms are specific whereas kinship and friendship norms are diffuse.

The alternatives, universalism-particularism and specificity-diffuseness constitute either-or action alternatives in any particular concrete situation, but when several situations are considered the extent of obligation varies. And there may be change in extent of obligation over time. Hence the interpersonal norms which are important for this thesis need to be viewed in hierarchic terms. For example, a pipeliner's obligations to a mature brother and an immature son both are particularistic and diffuse. But his obligations to the son transcend his obligations to the brother. The economic obligations of a person to his relatives outside of his wife and children are to "help out if he can." The economic and other needs of his wife and children come first.

"Friendship" is a term which is subject to very diverse definitions. It has been used in this thesis for lack of a better term. In this discussion "friendship" has been used to denote a voluntary relationship in which expectations are affective, particularistic, and diffuse. The relevant persons recognize each other as friends, and are recognized by outsiders as friends. No attempt has been made to describe the complete nature and functions of such relationships,

and, of course, the definition used here is not offered as complete or as the "best." The definition merely is convenient in an analysis of pipeline labor force dynamics.

Informal relations among workers within the context of the pipeline industry are not specified officially, neither are they determined by traditions external to the industry. Where neither official prescription nor tradition guides interpersonal relations, the observer has sought explanations in conditions indigenous to pipeline work itself. In this respect "exchange" seems to be a useful concept. Exchange arrangements among pipeliners have been viewed as the principal kind of mechanism which organizes the seasonal movement of the labor force, and through which workers enter the ranks of the skilled.¹⁴

Blau defines exchange as follows:

"Social exchange," as the term is used here, refers to voluntary actions of individuals that are not motivated by the returns they are expected to bring and typically do in fact bring from others.¹⁵

Exchange is viewed as more or less rational and consensual in the present study. Rationality has been a typical assumption in exchange formulations.

In this and in all the manifold activities of economic order, the social behavior of the natives is based on a well-assessed give-and-take, always mentally ticked off and in the long run balanced. There is no wholesale discharge of duties or acceptance of privileges; no "communistic" disregard of tally and earmark.¹⁶

We can anticipate some of the functions of the exchange networks for pipeliners in Malinowski's functional statement about the "Kula ring."

. . . the Kula partnership provides every man within its ring with a few friends near at hand, and with some friendly allies in the far-away, dangerous, foreign districts.¹⁷

Several advantages result from using the concept of exchange. Once a system of exchange among pipeliners is established it is not dependent upon interpersonal liking. Friendship is one of the relationships which is important in establishing systems of exchange but friendship is not persistent or stable enough to sustain the exchange obligations over as long a period of time as they apparently last. It might be noted that kinsmen, like former friends, need not like each other in order to sustain smooth relations.

The concepts of exchange and reciprocity imply a self interest emphasis. Such an emphasis seems to be anathema to those social scientists who have celebrated the passing of "economic man." Some attempts at resurrection, however, currently are being made. Homans applauds and defends the results.

Mankind has always assumed that a person stabilizes his behavior, at least in the short run, at the point where he is doing the best he can for himself under the circumstances, though his best may not be a "rational" best, what he can do may not be at all easy to specify, except that he is not apt to think like one of the theoretical antagonists in the Theory of Games. Before a sociologist rejects this answer out of hand for its horrid profit-seeking

implications, he will do well to ask himself if he can offer any other answer to the question posed. I think he will find that he cannot.¹⁸

One of the postulated functions of exchange relationships is that of system equilibrium; and equilibrium has been seen by critics of functionalism as one of the positions' weakest points. The present study, nevertheless, has been guided by the concept for two reasons. First is the author's preference for such a focus. Secondly, the observations seem to support such an interpretation. The search for equilibrium need not contain teleological assumptions, or conservative biases. Again, Professor Homans comes to the rescue:

I do not mean that all real-life groups are in equilibrium. I certainly do not mean that all groups must tend to equilibrium. I do not mean that groups have built-in antidotes to change; there is no homeostasis here. I do not mean that we assume equilibrium. I mean only that we sometimes observe it, that for the time we are with a group--that it is often short--there is no great change in the values of the variables we choose to measure.¹⁹

Kinship and Occupation

There are two reasons for the concern with kinship in the present study. First, the presence of pipeline workers who are kin to one another is one of the most obvious characteristics of construction crews. Second, kin ties wherever they are found in the United States, ordinarily are governed by particularistic and diffuse obligations. These value characteristics are polar opposites of the

universalistic and specific norms which govern worker-employer relations. Presumably, these characteristics should create conflicting and mutually undermining processes. Theoretically, either the norms of kinship or those of industry have to "give." The kin-industry incompatibility view is general within American social science, but it has been stated most explicitly by Parsons.

In more technical terms it (occupational system) requires a high incidence of technical competence, of rationality, of universalistic norms and of functional specificity. All these are drastically different from the patterns which are dominant in the area of kinship relations where ascription of status by birth plays a prominent part, and where roles are defined primarily in particularistic and functionally diffuse terms.²⁰

Several recent investigators have challenged the assumption that the conjugal nuclear family is isolated from other kinsmen or from the occupational system. The investigators, following a current fashion, have directed most of their criticism toward the work of Talcott Parsons.²¹ But, it is doubtful whether they have seriously challenged the latter's statement. Rodman points out that . . . "Parsons emphasizes the relative isolation of the nuclear family, while others stress that the family is not altogether isolated."²² Moreover, the investigators have not found "extended families" which some of them claim to have found. They have found a variety of situationally determined patterns of voluntary associations among kinsmen. These have included kinsmen as friends and confidants, kinsmen as

sources of economic aid, as participants in the person's upward mobility and a variety of other ad hoc relationships. In no way do groups of kinsmen so related resemble the institutionalized extended family in which membership is traditionally obligatory, and characterized by common residence. Common residence of all members of a contemporary extended family is possible, but no such, even accidental group has been described in the literature. It seems that two important conclusions can be drawn from recent discussions of the family-industry issue: (1) Patterns of association among kinsmen transcending those in the nuclear family exist extensively in the United States, and they possibly are functionally related more directly to industrial occupations than was thought. (2) These patterns originate in ad hoc arrangements among kinsmen, not in traditionally determined ways. They are governed by situation, circumstances, and even accident, rather than by institutionalized prescription. Individuals are fairly free to enter or not enter into such relations, and they are fairly free to withdraw. This freedom of association among kinsmen is reflected in American kinship terminology. Schnieder and Homans point out that terms of address vary greatly, depending upon interpersonal factors.²³

Kinship in Pipeline Construction

Kin ties found in pipeline construction work seem to center around aid in crew formation and job finding. They show no pattern other than the ad hoc arrangements described above. They involve kinsmen often because in the Southwest, kinsmen of any degree are very generally obliged to aid one another. But such aid is in the form of "he should help out (a brother, cousin, in-law, etc.) if he can." But his first obligations are to his wife and children. The ad hoc kin ties which seem to obtain on the pipeline, seem to be related to the industry in two ways. (1) Many supervisors depend upon kinsmen to help them form crews; workers depend upon kinsmen to hire them, or to furnish them with valuable job information. While such relationships are recognized by other workers, the participants cannot be described as "groups." (2) A second kind of arrangement among kinsmen, however, can be described as a "group" composed largely of workers who are kin to one another. Some gangs are manned almost entirely by workers who are kin to one another. This seems to be true on those gangs which are characterized by simple skills and low proficiency requirements. These groups recognize themselves, and they are recognized by others, as "bunches." Although the "bunches" may contain nonkinsmen who travel with the group, the bunch is referred to as the "Jones'," or the "Jones bunch." The members of a bunch

generally remain together, and the goals of its individuals may be subordinated to that objective.

By way of summary, the present study has assumed that the behavior of the pipeline labor force is best understood by examining the ways in which it is informally organized. Further, it has been assumed that such organization is functional, rather than dysfunctional for the industry--that nepotism and similar patterns act to fit persons to technical requirements. The outcome is production efficiency rather than disorganization.

FOOTNOTES

¹Donald W. Olmsted, Social Groups, Roles, and Leadership: An Introduction to the Concepts (East Lansing, Michigan: Board of Trustees, Michigan State University, 1961) pp. 38-40.

²Rothlisberger

³Alvin W. Gouldner, "Organizational Analysis," in Robert K. Merton, et al. (eds.), Sociology Today: Problems and Prospects (New York: Basic Books, Inc., 1960), p. 401.

⁴Donald Roy, "Efficiency and 'The Fix': Informal Intergroup Relations in a Piecework Machine Shop," American Journal of Sociology, 60 (1955), pp. 255-266.

⁵Eugene V. Schneider, Industrial Sociology: The Social Relation of Industry and the Community (New York: McGraw-Hill Book Co., Inc., 1957), pp. 193-94.

⁶Charles H. Page, "Bureaucracy's Other Face," Social Forces, 25 (1946-1947), pp. 88-94.

⁷Delbert C. Miller and William H. Form, Industrial Sociology: The Sociology of Work Organizations (2d ed.; New York: Harper & Row, Publishers, 1964), p. 280.

⁸Peter M. Blau, "Co-operation and Competition in a Bureaucracy," American Journal of Sociology, 59 (1954), pp. 530-35.

⁹Gross
Kahn

¹⁰Robert K. Merton, Social Theory and Social Structure (Rev. and enlarged ed.; Glencoe, Illinois: The Free Press, 1961), p. 382.

¹¹The term "indivisibility of control and consent" is Selznick's. Philip Selznick, "Foundations of the Theory of Organization," American Sociological Review, 13 (1948), p. 26.

¹²Gouldner, p. 501.

¹³Talcott Parsons, The Social System (Glencoe, Illinois: The Free Press, 1951), pp. 58-67.

¹⁴Exchange, as a central feature of social organization, has appeared in:

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Peter M. Blau, Exchange and Power in Social Life (New York: John Wiley & Sons, Inc., 1965).

¹⁵Blau, 1965, p. 91.

¹⁶Malinowski, 1966, p. 26.

¹⁷Branislaw Malinowski, Argonauts of the Western Pacific (London: 1922), p. 92.

¹⁸Homans, American Journal of Sociology, 63, pp. 597-606.

¹⁹Homans, American Journal of Sociology, 63, pp. 597-606.

²⁰Talcott Parsons, "The Kinship System of the Contemporary United States," American Anthropologist, 45 (1943), p. 35.

²¹Paul J. Reiss, "Extended Kinship Relationships in American Society," in Hyman Rodman (ed.), Marriage, Family and Society: A Reader (New York: Random House, 1965), pp. 204-10.

²²Hyman Rodman, "Talcott Parsons' View of the Changing American Family," in Hyman Rodman (ed.), Marriage, Family, and Society: A Reader (New York: Random House, 1965), pp. 262-86.

²³David M. Schneider and George C. Homans, "Kinship Terminology and the American Kinship System," American Anthropologist, LVII (Dec., 1955), pp. 1199-1202.

CHAPTER III

RESEARCH PROCEDURES

Data Collection

Data for the study were collected in three different ways: participant observation, planned interviews, and relatively casual contacts with pipeliners and people who had worked in the industry at one time or another. Altogether, data used in the thesis have been collected sporadically over a period of sixteen years. But the most intensive efforts to collect information were during the 1966 and 67 seasons.

The study was conducted within four different companies which seem to be roughly representative of the different sizes of companies in the industry. The observer worked as an unskilled and semiskilled worker in two medium sized ("two spread") companies. He interviewed workers and officials at all levels in two of the largest companies in Southern Michigan.

The term "participant observation" has a variety of meanings in social science literature.¹ In the present study, it means that the observer worked as an unskilled and semiskilled pipeline worker. During the participant period

he was never viewed by his pipeline associates as a "piperliner" but merely as a potential "pipeliner." He worked for three months during the summer of 1951. At that time he had no particular sociological interest in the industry. However, the experience did result in a future interest. He returned to the pipeline for a period of seven months during the 1953-54 construction season. During the later period the observer's attention had been fairly well focused upon problems of recruiting and job finding. Following that experience he published his observations of skill learning in the industry.² That study, however, did not explore the relationship of the kinship-friendship based apprenticeship system to the major structural features of the industry. The most serious omission was the consideration of the time and space conditions of employment which the industry imposes both upon the pipeline labor force and upon construction companies.

Later, through more or less casual contacts with pipeliners, the importance of the structural factors began to interest the observer. Casual contacts included those with several kinsmen and acquaintances who work at all levels in the industry, and with occasional pipeliners with whom he was not acquainted. The latter usually were contacted on "road crossing" jobs where crews are most visible to a motorist. Road crossings, which permit a good deal of free time, are convenient situations in which to talk to crew

members. The workers on a crossing have the time to satisfy an observer's curiosity.

The "occasional contact" stage of the study had some disadvantages. Chief among them was that very little was learned over long stretches of time. The procedure, however, had the advantage of leisurely observations. The long periods between contacts gave the writer plenty of time to incubate hypotheses which could be compared to subsequent statements of workers. During the casual contact period the observer developed a feedback technique which he employed throughout the entire study. He reported conclusions to the subjects and solicited their critical comments.

The most systematic and intensive interviews were conducted from June, 1966, to June, 1967, in Southern Michigan, Northern Ohio, and Ontario, among workers and officials in the largest and smallest company included in the study. The main purpose of the interviews, as indicated earlier, was to discover good informants. The observer felt that, with a few exceptions, workers and officials gave him excellent cooperation. Often, company officials were quite willing to talk especially about recruiting problems. They generally were interested in the study and often they were eager for advice on more effective recruiting which, unfortunately, the student was unable to give.* He was,

*When asked for such advice, the observer was tempted to reply that the solution to skilled worker shortage was more rapid training. But the introduction of enough skilled

however, able to do a limited amount of recruiting for the companies from among his sociology students.

Interviews were of two kinds: those with workers and supervisors on the job, and those with company officials at offices and restaurants. Those with company officials were direct, prompt, and usually easy to tape record. Workers and supervisors on the spread, however, were interviewed on a catch-as-catch-can basis. Whereas company officials made and usually kept their appointments, spread workers were reluctant to make appointments; "be glad to talk to you, come around any time." The invitations from workers were sincere, but such appointments usually meant that the student followed the pipeliner around for five or six hours in order to get one half hour of actual interview time. This was exasperating at first, but it turned out to be useful in that the person being alternately interviewed and required to work usually restarted the interview by explanations of what he had just been doing. The student at first had little interest in the technical problems thus explained. They were not often relevant to his research concerns, and he was fairly familiar with the purposes of most of the technical tasks. The technical explanations offered

workers to satisfy the demand during the heavy season would no doubt create as many problems as it solved. Enough workers for the summer months would create high unemployment during the rest of the year.

by the subject, however, proved to be an excellent means of establishing rapport. Previously, attempts by the interviewer to use small talk to establish rapport was awkward, and not very successful.

Interview statements were generally recorded at the end of the work day. Note taking and tape recording on the job was inconvenient, and the notes seemed especially to interfere with the spontaneity of the conversations. The notebook, bought to carry on the operating spread, was finally used only for addresses and phone numbers--to write down such information as "you ought to talk to old etc." The student did, however, tape all of the conversations between himself and one construction superintendent during an entire work day. The superintendent went from one gang to the next throughout the entire day. The tape, switched on and off, contains approximately five hours of conversation.

None of the observations or interviews were conducted with a preselected sample of workers, of gangs, or of companies. Rather, the respondents were viewed as informants in the sense that ethnologists have used the terms.³ Indeed, the interviews became a process of selecting and rejecting informants--pipeliners to be interviewed in detail. The student did, however, try to get maximum contact with workers in all authority levels and skill groups. The student talked to people who were both satisfied and very dissatisfied with their occupation.

From the student's pipeline experience in 1951 through the effort in 1966 and 1967, contacts were made with informants from several positional contexts. That is, the student was able to view pipelining from the perspectives of worker, relative, acquaintance, and researcher. The resulting experiences were very different in the various contexts. For example, as a newcomer, the student-laborer was subject to the normal initiation rituals; and among these were often elaborate items of misinformation. (The pipeliner term is "bullshitting.") The misinformation, along with other features of initiation, function to dramatize the newcomer's status in the organization. Once the student learned the behavior appropriate to his "place," the behavior of other workers became unguarded, and, consequently much of the "back region" behavior of pipeliners at work became available to him.⁴

It was, of course, necessary to evaluate the reliability of the informants' statements. The most important hunches came from the observer's cumulative experience. Informant statements were evaluated against the observer's knowledge of pipeline folklore. Many honest statements, of course, were the informant's interpretations of ambiguous events or hearsay events. The more ambiguous or distant the event, the more subject it seemed to be to folklore interpretations. For example, several workers told the observer that the president of a large construction company had

inherited the business from his father. The father was characterized as "the best man you would ever want to meet"; the son was described as a "bronc," and a "bastard." Even if the relevant terms were defined, the "fine old man-rotten son" myths are so much a part of American business mythology that they cannot be taken at face value although they may be important.⁵ As it turned out the company president was not a son of a former owner.

Finally, and perhaps most important, is the consistency among informants. After the informant has reported his idiosyncratic experiences, there usually remains a core of experiences which he has shared with and viewed much the same as others in similar circumstances. It is this core of common experience which seemed to be most valuable for reconstructing the most important aspects of pipeline life.⁶

The observer used a type of feedback in which he formulated hypotheses and had workers to reflect on them. Direct questions were often quite productive. For example to the observer's pointed question, "Do you have any particular problems as a result of foremen hiring their own relatives?" one company official replied, "The only problem we have is that the foremen don't have enough relatives."

As the project progressed, both observations and questions became more focused in order to get information about: (1) geographic movement of the labor force, (2) worker preferences regarding jobs, (3) shipping company

requirements as represented by inspectors, (4) contracting company recruiting problems, (5) kinship recruiting patterns, (6) other recruiting patterns, (7) statements and actions related to conflict or strain resulting from the recruiting and training process, and (8) patterns which seemed to act to articulate particularistic hiring with the technical requirements of the industry.

The seventh item above was especially important, since a convincing absence of evidence of strain, especially of the subjective experience of role conflict among supervisors, indicates that the labor force has developed patterned ways to forestall or reduce the impact of such strain.

Observation and Observer Effect

Several social scientists have indicated that the observer needs to be examined as thoroughly as any other research instrument.⁷ This is a difficult procedure and it probably never yields the objectivity which we might want. Nevertheless such an examination is probably valuable. Following is a description of this observer's varying relationships to pipeliners:

The writer's own experience as a participant observer and later as an interviewer on the pipeline can best be described as a movement away from an autistic view of pipeline life to a more theoretically relevant view of the labor

force characteristics of the industry. His first serious contact with pipelining was in the summer of 1951 when he worked as a laborer to supplement his income as a public school teacher. The earliest phase in the writer's experience as a pipeline observer was an acute awareness of the "spread" status system. Prestige and power on the pipeline are relevant to the present study, but they are not as important as to the worker who's employment represents a considerable and sudden drop in status. (This sensitivity to status has been an almost universal experience among college students and occasional college instructors who have worked during summers on a pipeline.) Later, the observer began to be aware of the prominence of kinsmen on pipeline crews. Despite the fact that he obtained his first job as a pipeliner through relatives, he tended to see his own situation as a special case.

It became apparent that kinship was a principal factor in crew formation in the whole industry. Moreover, the preferential hiring of kinsmen seemed to be almost always openly practiced and uncontested by other workers. Discussing the hiring of relatives seemed to threaten subjects not at all. In short, the student failed to find any impressive evidence of sensitivity regarding the hiring of "kinfolks."

The kinship manned companies which the observer knew about had been in existence for several years. Consequently,

he began to suspect that the staying power of the companies was due to kinship and other primary group based hiring, not despite them. Also, it seemed that the people who frequently hired relatives had ways of doing so without violating either production standards or primary group obligations, and furthermore, that the means of satisfying both sets of obligations were built into the informal organization of the industry itself. That is, the supervisor was not necessarily dependent upon his own ingenuity to get him out of "fixes."

The unwitting influence of observational procedures ("observer effect") upon the subjects needs to be considered. Observer effect in participant observation primarily is harder to control than the effects of more mechanical procedures. Despite the difficulty, the observer needs to make the best judgments possible about the effects of his presence and activities upon his subjects. In the participant observer phase of the present study, there seemed to be few or no consequences of the observer's activities as observer. Indeed, at one period in the observer's experience as laborer, he ventured to suggest to a group of workers that he wanted to do a study of pipeline skill learning. The observer's attempt, however, to characterize himself as something other than a "skid-hustler" backfired. A worker on the same job claimed to own a new and expensive automobile which no one had ever seen, and another worker frequently made oblique references to greater wealth than his present

circumstances indicated. The workers were familiar with blowhards; they responded with an amused "the hell you say."

Observer effect during the later interview period seemed also to be negligent. Interviewing workers and supervisors on the job requires much more time "hanging around" the spread than did the actual interviews. It seemed that after the initial "who the hell is that" and "are you (a reporter) from the Pipeliners," workers went about their business in a completely normal way. Indeed, it now seems somewhat grandiose for the observer to have assumed that he might have changed anything, except that he sometimes helped to reduce the contents of worker lunch pails.

A much more obvious and important determinant of what observations could be made was the observer's various positions with respect to the industry. Access to much information during the participant observation phase was limited by the lowly status of the observer. The student found later that contact with status unequals was much easier to establish when he was an acknowledged outsider than it was when he was a participant. As a new low status worker, the observer's quest for certain kinds of informations from even his relatives seemed to become more restricted once he became identified as a pipeline worker. Moreover the new and uninitiated worker is almost certain to touch upon forbidden topics in his attempts to get information.

Between 1954 and 1966, the observer talked to relatives and to numerous other people who work or have worked on the pipeline. Being kin to a number of pipeliners at all supervisory and skill levels gave him trust from pipeliners but at the same time he was not in a position to embarrass informants or to interfere with the smoother operation of interpersonal relations by knowing too much. Above all, these acquaintances furnished a leisurely means of "testing" thoughts in plenty of time to formulate and ask more and more focused questions.

Being related to pipeliners in management had its serious disadvantages of course, especially while working as a participant observer. The reasons for this are quite obvious. Being the superintendent's son-in-law gave the student-pipeliner inside dope from the top more readily than from the bottom.

Interview data lacks the richness of content which the observer was able to obtain by participant observation. On the other hand, it was relatively easy to interview individuals at all levels of management and skill. Moreover interviews gave the observer an opportunity to focus on certain kinds of data much more clearly than was the case with participant observation. Workers at all levels seemed accessible. Being accepted as an "observer" seemed to legitimate certain kinds of probing which, as a participant in the industry, might have gotten the observer classified as a "nosey bastard."

Advantages and Disadvantages of Qualitative Research

Field studies such as the one reported in this thesis attempt to achieve depth and penetration rather than breadth and representativeness. The participant observation and related techniques of this study, however, do not lend themselves to the exact testing of hypotheses. Rather, conclusions rest upon what Becker and Geer have called "quasi statistics" ("many," "most," "usually," "rarely," etc.) and upon a "calculus of plausibility."¹⁸ There is, to be sure, a lack of precision in field studies. Consequently the reliability of observations are difficult to establish. And, claims to validity are perhaps best left to researchers who use more systematic techniques. However, as Vidich and Bensman point out, many of the sources of spurious validity which are readily recognized in field studies are also characteristic of other techniques.

. . . The same errors, deception, misinformation, inhibitions, and role-playing operate even in check-list research, as is indicated by the differences in response by the same respondents interviewed by different techniques. This is equally true of attitude surveys, self-administered itemaires, and fact-finding census-type interviews. In brief, the central problem rests in the fact that all answers to the same question on a questionnaire are not of equal weight and cannot be treated as such.

In his depth studies, the anthropological field worker, because he limits the extent of his study, is able to penetrate in depth into various segments of the community and to weigh the relative importance of different institutional structures, roles, and individuals, and the linkages between them. While doing this he is able to check

information from a respondent by other information given by the same respondent at later dates. He is also able to check the information with that of other respondents and by observing the behavior of the informant himself.⁹

It is not true, as is sometimes asserted, that field observations are unreliable because they deal with cases which are unique. Presumably, the observer notes actions and statements which recur. He notes patterns of behavior, not necessarily personal idiosyncrasy. If his conclusions have any relevance at all to social science, they can be checked by other observers who care to take the trouble.

FOOTNOTES

¹Participant observation may mean that the observer participates as a recognized outside observer or as a full member of the group whose research aims are hidden. All of the usages, however, imply the observation of social behavior in natural settings.

C.f. Claire Selltitz, et al., Research Methods in Social Relations (2d ed. rev.; New York: Henry Holt and Company, Inc., 1960), pp. 204-05.

²Bennie Graves, "'Breaking Out': An Apprenticeship System Among Pipeline Construction Workers," Human Organization, 17, pp. 9-13.

³John W. Bennett and Iwao Ishino, Paternalism in the Japanese Economy: Anthropology Studies of "Oyabun-Kobun Patterns" (Minneapolis: University of Minnesota Press, 1963).

⁴Erving Goffman, The Presentation of Self in Everyday Life (Garden City, New York: Anchor Press, 1959), pp. 106-40.

⁵The myth, of course has some basis in fact. Organizations perhaps are larger and more impersonal during a sons' tenure, than during the "old man's."

C.f. Arthur Miller's play, Death of a Salesman.

⁶The commonness of informant reports is an important reliability criterion for anthropological investigators. We normally accept such (informant) statements. In them the anthropologist ascribes regularities, he imputes ends. What is his justification for doing so: It is primarily the degree of uniformity of his experience as he moves through his field of social observation.

Firth, p. 22.

⁷Bennett

⁸Howard S. Becker and Blanch Geer, "Participant Observations: The Analysis of Qualitative Field Data," in Richard N. Adams and Jack J. Preiss (eds.), Human Organization Research: Field Relations and Techniques (Homewood, Illinois: The Dorsey Press, Inc., 1960), p. 326.

⁹Arthur Vidich and Joseph Bensman, "The Validity of Field Data," Human Organization, 13, No. 1 (1954), pp. 20-27.

CHAPTER IV

PIPELINE INDUSTRY AND CONSTRUCTION INDUSTRY

Shipping Companies and Construction Companies

Most construction work is contracted by construction companies which are owned and operated independently of the pipeline owning companies. The pipelines themselves are owned by petroleum, public utility, and pipeline companies. The owning companies ordinarily award contracts to the lowest bidding construction company. Although some of the owning companies have their own pipeline construction and repair crews, the tendency during the past thirty years has been to turn over construction work to independent contracting companies.¹ When a contract for a particular pipeline construction is awarded, the contracting company proceeds on the job with its own men and equipment, or it may subcontract parts of the job to other contractors. The contractor may also rent much of the equipment which he uses in the construction.

The petroleum shipping companies found the occasional construction which they needed to be costly and cumbersome when they used their own crews and equipment. The earliest

form of "independent" construction company was a relatively autonomous organization which was subsidized by a parent petroleum company. The quasi-independent companies consisted of a few officials and some equipment. This was found to be a satisfactory arrangement for a while because in the early years of the pipeline industry the equipment was simple, and men could be hired and mules rented on a single contract basis. There was little concern about what to do with men and machines between occasional construction projects. However the rapid introduction of more and more complicated and more expensive machinery, and the occasional need for construction, combined to create conditions which today give the pipeline construction industry one of its most distinctive characteristics--a highly skilled and mercurial labor force. The pipeline industry has become one in which the short term intensive need for skilled workers alternates with equally short periods in which there is no need at all. It was out of this development that the independent contracting company emerged.

The advantages for the shipping companies of contracting to outside construction companies are fairly clear. The independent contracting company could own or rent expensive equipment because it was free to work for any shipper who accepted its bid. The independent operator was not tied to the occasional construction job for a single petroleum company. He could own equipment profitably because he could

keep it working. The shipping company no longer was required to own expensive but frequently idle equipment, and its officials were ridded of a chronic labor force problem.

The present day ease with which construction companies are formed and dissolved are strikingly similar to the proliferation and demise of auto manufacturing companies in the early years of the automobile industry.² A pipeliner who has, or who can borrow, a few thousand dollars at one time can become a contractor. With considerable frugality he can earn the necessary money during one season. He often can buy on credit and rent all of the equipment that he needs. Pipelining has its rags-to-riches legends and the industry has produced one such subject for a biography.³ Almost every issue of Pipeline Construction, the major trade journal of the industry, contains items reporting the formation of new companies and items reporting the demise of companies. The following two news items represent the ups and downs of pipeline contracting.

Among pipeliners in and out the office lately were Earl Saulsman and Jack Slack who are forming a new corporation, to be known as Saulsman-Slack Construction Inc., for construction of dry-lay and river crossing lines up to 20-inch diameters. Earl has been in the business for 24 years, sixteen of them as spreadman. Jack got into pipeline construction back in 1950 and formerly owned his own equipment distributorship in Venezuela. They're setting up their office at 3810 Westheimer, Suite 428, in Houston.⁴

"Quail" Partridge has sold his interest in Erie Pipe Line Construction Co. and reports he is ready to make some contractor a good hand.⁵

Along with the appeal to the shoe-string operator of a contracting company of his own the existing companies seem to be becoming larger and more differentiated. The result has been (1) that many companies can handle several contracts at the same time, and (2) there has emerged highly specialized contracting companies. Some of the latter have men and equipment only to x-ray arc welds. Others specialize in blasting, doping (pipe coating), road crossings, and "tie ins" to gas wells and to distribution systems.⁶ Despite the fact that companies are getting larger, the small operator continues to be prominent despite the high probability of failure.

Failures are impossible to count. Most of the contractors who do not survive do not often go through formal bankruptcy proceedings. They "sell out," or allow equipment to be repossessed. As one pipeliner put it: "They don't actually go bankrupt, they just lose their asses and fade away"--usually back into the ranks of skilled workers or they become supervisors for other companies.

Petroleum and Pipelines

Present day pipelines, as reported earlier, ship numerous products other than petroleum. But the rapid growth of the petroleum industry in the first half of the twentieth century has been the great impetus to pipeline construction.⁷ The petroleum industry had its beginning in the late

nineteenth century. Because the petroleum industry's principal product was lamp oil, however, it at first replaced and later almost followed the whaling industry into relative unimportance as a result of Edison's invention of the electric light bulb. The petroleum industry, however, recovered from the encroachments of electricity with the advent of internal combustion engines. Along with the rising importance of petroleum as engine fuel, the industry began also to compete with the coke industry by making natural gas available as a fuel to heat homes.

The history of the petroleum industry has been one of waste, innovation, and conservation. Innovation has proceeded to the point that the only thing that the refinery wastes is "the bad smell" it produces. For the first twenty to thirty years, millions of gallons of gasoline were wasted because it was assumed that gasoline had no economic importance. Gasoline was too explosive and it couldn't be used in lamps. Natural gas, often a by-product of oil wells, was likewise burned off as a useless fraction for many years. Burning the gas was easier than controlling its flow. Natural gasoline, variously called "casing head," "drip gas," and sometimes "midnight ethel" (due to the fact that people in the Southwest could easily fill up automobile tanks with untaxed natural gasoline from "drip valves" on pipelines), is a good example of a recent development which expanded the pipeline industry. The natural high octane gasoline, a

precipitate in natural gas lines, was wasted for many years. The lack of lubrication in the gasoline made its use in engines damaging. Beginning in the late thirties petroleum companies added oil to the gasoline and it is now being sold by numerous "cut rate" service stations. Despite the demonstrated potential of natural gas, its conservation was resisted until World War II. For example, in a lengthy report to Congress, Humble Oil Company officials presented geological and other "proofs" that the supply of natural gas was almost unlimited. Humble explicitly withdrew its objections to conservation shortly after World War II started. Other large companies followed suit. There was no geological and other evidence that natural gas was not unlimited, and state and federal laws have since been passed requiring the conservation of natural gas.⁸

Pipelines, at first encouraged and financed by railroads, early began to ship oil at less than one-tenth the cost of any other means of transport. For a short time, railroad interests waged a successful legislative battle against the pipelines. John D. Rockefeller, however, successfully contested the railroads through state legislatures and the Federal Congress.⁹ By 1907 approximately 45,000 miles of pipelines had been built in the United States. Since then a world-wide search for oil has proceeded. Large new fields were opened up in the American Southwest, the West, and in other parts of the world especially in the

Middle East. The first transcontinental pipeline (24 inch) was built in 1931 to carry natural gas from the Texas Panhandle to Chicago.¹⁰

World War II also saw the greatly expanded usefulness of crude oil pipelines.¹¹ During the war emergency the "big inch" and the "little big inch" pipelines were built to furnish Northeastern American cities with a ready source of fuel to replace other kinds of fuel which were needed for the war. These lines also replaced tankers which were vulnerable to enemy submarines. Pipeline technology was also developed in theaters of war where allied armies built and maintained pipelines to supply water and gasoline to the advancing motorized troops. These lines were made of portable units. Some of the same techniques that are now used in river and difficult swamp crossings were developed in combat zones during the war. During the war pipeliners also learned how to lay pipelines under the ocean. The British used three inch piping of flexible steel or lead alloy that could be paid out from drums like an electric cable. The British laid twenty such pipelines which varied in length from 29 to 66 miles across the English Channel bottom. The lines transported approximately one million gallons of gasoline per day at pressures of up to 1200 pounds per square inch.¹²

The most recent impetus to the growth of pipeline shipping companies has been the development of the petrochemical industry. The manufacture of carbon black and of

hundreds of different "miricle" fibers, made from the by-products of natural gas, have become extremely important in numerous industries--plastics, clothing, furniture, and other industries. Because of that development natural gas pipelines have been built at a rapidly increasing rate during the past twenty-five years.

The approximate average cost throughout the entire world of laying a six inch diameter pipeline, under "normal conditions," presently ranges between \$100,000 and \$150,000 per mile. Exceptional circumstances can double or triple these costs. But despite the high initial expense, pipelines have proven to be the most economical method of over-land transportation of liquids. Presently in North America pipelines carry 20 percent of all the land freight moved on the North American continent.

Technology and the Organization of Work

Since the turn of the century the pipeline construction industry has been characterized by a relatively rapid technological development and equally rapid division of labor requiring more and more highly trained specialists. The very first pipelines were made of wood. These were shortly replaced by cast iron joints of pipe which were bolted together. Steel pipe with high tensile strength was developed in the 1920's, and new acetylene and arc welding methods were developed. As a result of welding, leakage is

presently a very rare (although costly) occurrence in modern pipelines. The petroleum industry, at first characterized by the romantic figure of the wildcatter, is now characterized by elaborate and differentiated organizations.* The widely scattered distances and increasing amount of equipment needed to build modern pipelines, as noted earlier, has encouraged the emergence of independent pipeline contracting companies. Contracting companies could own small amounts of equipment, and they could keep the equipment fairly busy throughout the construction season. Small contractors could do work within a specific area of the Southwest or elsewhere.

The typical contracting firm seems to be a small company owned jointly by two or more men who have a great deal of experience in pipeline construction work, but little capital. With a few thousand dollars, rented equipment, and "more guts than brains" almost anybody can become a contractor.

The early construction crews were simple and they did not need to be elaborately trained. The only key men on the pipeline were those who had to have more than a few hours of technical training to do their work--the "stabbers," "collar pounders," "point men," and "tong men." The stabber, the only specific skill which has survived to the present, was

*Turn of the century pipeliners were called "cats." The word "cat," used to refer to a crawler tractor, is a lay term. Pipeliners interestingly, call a tractor a "tractor."

the worker who made certain that the two joints of the pipe were aligned so that the collar that screwed them together would not be cross threaded. This took a great deal of skill in the early days because there was no alignment equipment to reduce human error. Collar pounders were workers who pounded the collars which tied the joints together. According to Loos the main skill required of the collar pounder was the development of a rhythm which gave optimum workability to the collar as the tong men screwed it onto the pipe.¹³ The tong men themselves were not necessarily highly skilled although the point man was more thoroughly trained. The gangs were likewise simple. The pipe gang, at the turn of the century, did most of the tasks that are now done by several different gangs. The pipe gang put the pipe joints together, coated the pipe by hand and lowered it into the ditch. The ditch was backfilled by unskilled laborers with spades.

The largest companies hire several thousand workers, and they build pipelines throughout the world. Medium sized companies hire several hundred workers and they operate in the United States and Canada. The more numerous smaller companies hire several dozen workers and they generally confine their activities to the American Southwest, or if they are specialized, the smaller companies subcontract specific kinds of work over a wide geographic base.

The "spread" is the pipeline work plant. It consists of an organization of enough workers and equipment to build a single pipeline. Two or more spreads may work on the same job, but the single spread consists of work gangs, several skill levels, and a hierarchy of supervisory roles.

The spread is divided into eight or ten work gangs. These are organized around general work tasks in pipeline construction. The number of gangs actually working on a job varies as the job progresses, beginning with one or two, increasing to the maximum near the middle of the job, and finally ending with the "clean-up gang."

Jobs may be divided roughly into skilled, semiskilled and unskilled tasks. This division seems to correspond to that made by workers themselves and to differences in pay scales. Tractor operators, some machine operators, and welders are skilled. Their work is restricted to well defined operations with specified equipment. Training for skilled jobs takes from several months up to three or four years.

Semiskilled jobs are not as readily classified as are the unskilled and skilled jobs. They are not numerous, and with some exceptions, the need for semiskilled workers is intermittent. Semiskilled workers are often unskilled laborers much of the time who travel with the company. Unlike the skilled jobs, semiskilled work involves no long and

elaborate apprenticeships. They may be learned in a few days or a few hours.

Some unskilled workers are helpers to skilled workers; others are highly transferable general laborers. Most of these workers are local since the pay scale for laborers would hardly permit them to make the frequent moves from job to job as it does higher paid workers.

Three different classes of supervisors usually are found on the spread: "spread man," "gang foreman," and "straw boss." Just below the contractor-owner who sometimes "bosses a job" is the spreadman. The spreadman usually is in charge of the entire job. When two or more spreads work on the same contract, the spreadman will be superceded by a "superintendent" who is in charge of all of the spreads. Just below the spreadman in authority are the various gang foremen (or "pushers"). The "straw boss" is a worker who is assigned to supervise a small gang of laborers on special problem jobs which are not handled directly by any of the standard gangs. The job of a straw boss may last from less than an hour to several days, depending upon the special task. Once the task is finished, he returns to his regular job. Straw bosses are chosen from among workers on the entire spread. They may be, and often are, laborers, "old heads who know the pipeline."

These official boss roles do not exhaust authority relationships among the workers. Owning company inspectors

and workers with helpers are unofficial bosses. Inspectors, hired by the owning companies, have power over any worker on the spread. "They are here to keep us honest." Although they do not hire workers they can veto appointments and they specify work quality standards for workers in terms of company policy. They have the authority to fire any worker whom they believe to be doing faulty work.

Welders and tractor and machine operators are responsible for the work quality of their helpers. They do not hire or fire the workers directly but their preferences for certain helpers are respected by "real bosses," and they can have a helper fired or transferred by complaining to a foreman or to the spreadman.

The companies compete with one another for contracts and for skilled workers. Competition for contracts is carried on mainly among companies of roughly the same size. Larger companies do not often compete for the "tie in," "take up," and "little inch" jobs which the middle sized and small companies find manageable and profitable.¹⁴ Moreover, the largest companies subcontract many jobs to smaller companies. Among medium and small companies, however, competition is vigorous during the "lean" part of the season.

Competition for contracts accounts for much contractor anxiety, but competition for skilled workers is the greater concern. One construction superintendent stated: "To get jobs you have to know your business but getting

hands is your real headache. You can't get hands unless you know where to find them."

Before the construction crews begin work on a job two important things have already been done. Legal claim to a right of way has been secured and the right of way has been surveyed and staked. Construction begins when the "right of way" gang begins to prepare the right of way for the work. The gang clears brush and timber, and levels the right of way as much as possible so that heavy equipment can move easily along its length. The gang redirects small streams of water and it completes numerous other special tasks on the right of way. The right of way crew ordinarily needs one or more tractor crews each of which consists of an operator and his "swamper" (helper). The gang frequently uses special equipment such as chain saws and dynamite.

The stringing gang follows the right of way gang. The stringing gang has a task of stringing the joints of pipe at places along the right of way where they will be needed. The stringing gang contains tractor crews and truck crews.

The "ditching" gang cuts a ditch behind the pipe stringers. It ordinarily consists of ditching machine, an operator, and two or three swampers. Next, the pipe gang has the task of connecting the joints of pipe by an initial weld called a stringer bead. This gang is ordinarily equipped with at least two tractors and several swampers.

The pipe gang ordinarily has two welders; other welders work in one of the two welder gangs. The first welder gang consists of "hot pass" welders. These welders (usually two) place a second bead around the joints of pipe. The "hot pass" holds the joints together until the regular welder gang comes along to add "fillers" and "cap." At that point the welding is completed. The pipe gang is followed by the "dope gang," whose task is to coat the pipe as a protection against moisture and to prepare it against the corrosive effects of electrolytic action. The "lowering in" gang lowers the pipe into ditches. As a precaution against "buckling" due to contraction and expansion, the pipe is lowered early in the morning at which time its temperature is approximately what it will be under the ground. The "backfill gang" then fills the ditch with dirt. The clean up gang ordinarily comes behind the backfill gang. This gang has the official task of restoring the right of way. However, over the years the clean up gang has generally had the task of mollifying property owners. Skill in the latter is very often a factor in the selection of a foreman for the clean up gang. The clean up foreman usually is one of the most diplomatic individuals on the pipeline.

Special crews are needed to complete road, river, and railroad crossings, tie-ins to wells, pump stations, refineries, and other lines, and to install "gate valves." Most of these special gangs use men from other gangs on the

pipeline unless the task has been sub-contracted to other companies.

A worker's informal power and prestige is most often a reflection of his formal work role, less often of the gang in which he works most of the time. His prestige may be inferred from the stereotypes other workers use to describe him. His power may be inferred (with less certainty) by watching him negotiate with managers in disputes over pay or working conditions, and the control he has over who is to work on the spread.

The welders are the elite on the pipeline. Most of them own the welding "rigs" which they use. The welder "hires out" both himself and his rig to the contractor. He is paid with two separate checks: one for his labor and one for his truck and welding machine. A few "single hand" welders use rigs belonging to the contractor and a few other workers hire out their trucks and other equipment to the contractor; but welders are the only workers who commonly own their own equipment and expect to be paid for it on any job for any contractor.

Welders work as a gang but other skill groups do not. They often have to meet more rigid work standards than do other skilled workers. For example, welders are the only pipeline workers who are tested by the owning companies before the job starts. Before they may be hired by the contractor, welders must have their specimen welds examined by

owning company inspectors who often use x-ray and other equally searching techniques. Once hired, a welder must engrave a code letter on each of his individual welds so that he may be identified if one of the welds is later found to be defective.

"Bulldozer" and "side boom" operators seem to be next highest in the prestige and power hierarchy. The prestige and power gap between these operators and welders, however, probably is greater than that of any other pair of adjacent positions in the industry. In 1966 salaries for operators were approximately \$4.50 per hour, but the combined income from salary and rig rent of welders, most of whom work in the welder gang, averaged \$8.50 per hour. As a group, operators seem to have little control over the hiring of other operators since they are distributed among most of the groups. Negotiation with managers is on an individual basis. In worker-manager conflicts, the operator is more likely to identify himself with the gang in which he works rather than with other operators.

The romantic conception of what pipeliners are like is probably most often played out by tractor operators. This fanciful picture of pipeliners is worth some examination. It is an inaccurate description of the workers, but it is a part of the pipeline folklore and it probably affects the behavior of some workers, especially the younger inductees. The clearest statement of part of the stereotype

is found in Ball: "This is the pipe-line crew . . . tough, hard-boiled, and efficient.--They could be arrested for their songs and jokes . . . They'll get out of hand if given half a chance, but they'll lay a good line from here to there and vanish like smoke when the job is over."¹⁵ The same romantic picture may be seen in the boasts of a young and newly trained tractor operator--"What do you want to study pipeliners for; they're a bunch of no good bums, drunkards; always on the prowl for women and whiskey. You take me for instance, I never had two drinks before I started pipelining. Now I am just like the rest of them."

Tractor operators often become the center of attention in dangerous and dramatic work situations. One recurring task is that in which several side boom tractors work in unison to lift a common maximum load. If one of the operators releases his part of the load prematurely the other tractors may be turned over. Another dramatic situation is one in which right of way dozer operators sometimes work on precarious cliffs and steep mountain sides. Some "Canada pipeliners" (United States citizens who work on Canadian pipelines) belong to an exclusive "Bird Club," an unorganized prestige group of operators each of whom has successfully abandoned his machine after it has started over the edge of a cliff.¹⁶

Nearby workers are allowed to stop work and watch these and other dangerous operations although they do so

without explicit permission from supervisors. This probably helps to maintain the belief that operators "don't give a damn for nothing" (not even their own safety), but there probably are fewer injuries to operators than to their "swampers" who literally work under the tractors, or to welders and welder helpers who often work in "bell holes" which may contain undetected poisonous or explosive gases. The danger to operators is conspicuous and dramatic, but the danger to other workers is not.

There is an apparent eagerness among young laborers to become operators rather than higher paid welders. While watching an especially intricate performance by a dozer operator the observer recalls thinking that under different circumstances the operator might have been a superb ballet dancer. He did not discuss the possibility, however, with the operator--masculinity norms being what they are on the pipeline.

Other machine operators such as dope, cleaning, bending, and beveling enjoy less prestige as a group than do welders and tractor operators. The salaries for dope machine and bending machine operators are often equal to that of tractor operators, but the salaries of cleaning and beveling machine operators are lower. These different operators seem to identify themselves with the gangs in which they work rather than with the relevant skill group. These skills shade off into the semiskilled jobs. Many of the operators

do not collect waiting time pay as do the tractor drivers and welders.

Laborers are the least homogeneous of all of the skill groups, and there is a distinct prestige hierarchy among them. A laborer's position in the hierarchy seems to depend upon whether or not he is an in group pipeliner and upon the kind of work he does. Welder helpers enjoy highest prestige. They often are paid a higher salary than are other laborers. They sometimes "go in for ten" (receive wages for a ten hour day although they have completed the work in less time) as do the welders; most other laborers do not. Welder helpers identify themselves with their respective welders. When asked who his boss is the welder helper, who is called a "pimp," is likely to name his welder rather than a foreman or spreadman.

The dozer, side boom, and ditching machine swampers are next highest in the laborer prestige hierarchy. They rarely receive higher pay than other laborers, but occasionally the in group pipeliners among them "go in for ten."

The laborers who are the lowest in the hierarchy work with spades and place skids under pipes. They do much of the "dirty work." Most of them are hired for a single contract only. They never go in for ten nor do they ever receive waiting or travel time pay.

In addition to prestige associated with formal work roles, there seems to be three subclasses of in-group

laborers. There is the "old head" who "knows the spread." He does all types of unskilled and semiskilled work; he is often called upon to straw boss laborers on special jobs. The few of these men that the observer knew had been skilled workers on the pipeline, but they had not adapted to the changing technology. One of these laborers told the observer that he had never learned to drive a tractor but "there wasn't no job that I couldn't get a job skinnin' them mules." Another one still boasts about the number of feet per day he could "rag" (coat) by hand before his skill was replaced by the dope machine.

Another similar group are the workers who "don't give a damn for nothing and wouldn't break out in a trade if you gave them a chance." For example, "you take old H____, he is likeable; he's had a hundred chances to break out but he will work along for a dollar an hour before he will go to the trouble."

There is some prestige attached to gangs. The dope gang is "dirty" and those workers who prefer the dope gang, "solid dope hands," are "more than apt to go to seed." The pipe gang seems to share the glamour of the operators. Welders are thought to be "smarter than other workers." They are frequently considered to be smarter or more intelligent than other workers by virtue of the fact that they earn more money. Tractor operators, however, have the advantage of a more or less glamorous tradition. Other operators

enjoy some prestige over laborers because they "have a trade." Not everyone, however, wants to become a welder, although a frequent pattern is to start out in youth as a bulldozer or side boom tractor operator, and later on to "settle down to welding where the money is."

It has been impossible to determine any precise rate of income for pipeliners. Wages are often supplemented by loans of trucks and other equipment for the pipeliner's own use, and by "under the table" expense accounts. The following are approximate estimates furnished to the writer by an official of the largest company in which observations were made. During the 1966 season a welder earned approximately \$5.50 per hour plus \$3.00 per hour fee for his welding rig. Tractor operators earned an average of \$4.50 per hour. Other operators averaged \$3.50, truck drivers \$3.50, welder helpers \$2.25, and other laborers, \$2.00.

The workers generally participate in unions only when they have to. The two companies for which the observer worked are among the few anti-union strongholds in the Southwest. In the Midwestern companies, all of the workers were union members, but their attitudes toward unions ranged from indifference to hostility. The union is seen as an interfering out-group by both management and workers. The workers see in union participation a loss of overtime work; management, although it pays union wages to most workers, sees a threatening loss of control over workers. In overt conflict,

the workers often can be expected to align themselves with the company. Some Southwestern workers, however, admit: "Sure, I get union scale and maybe a little more but that's cause the union is breathing down the contractor's neck. If he don't pay me union scale he knows I'll join a union." Several of the Southwestern workers saw no particular connection regarding their present condition and the possible indirect role of unions. Union membership often means to the worker simply that dues have to be paid and that he may have two bosses instead of one.

The fear of union interference with overtime is realistic. Unions do attempt to restrict the amount of overtime that can be worked in areas where more men might be employed. A less frequently mentioned cause for opposition to the union is the hiring of Negroes. Negroes are hired to do pipeline work in the South and Southwest along with other members of minority groups. But they are generally segregated at work, and they do not ordinarily hold supervisory positions.

Direct labor union action is not frequent in the pipeline construction industry. This seems to be true partly because the industry had its greatest development in the south and southwestern states where unionism has been generally less successful than it has been in the industrial north. Even in northern states where unions are more active in the pipeline construction industry, effective unionization meets

several problems. Teamster, boiler maker, welder, and various laborer and truck driver locals all may represent different fragmented groups of workers on a single job. Moreover, as the worker moves from job to job he is involved with more and more different locals. Labor union officials reported that the men are very hard to keep up with, and often there is no way to know whether or not workers, even in the Midwest, are working with or without currently valid union cards. Each of the unions has jurisdiction over only a small portion of the workers who make up the operating spread. A union very seldom is able to tie up the work of an entire spread by a strike of one group of skilled workers. The only picketing, for example, which has taken place during the past several years in the Mid-Michigan area was a case in which one local picketed another local because of a jurisdictional dispute. Several of the construction officials were unable to remember a single time when such union action was taken against the contractor or the shipping company.

An extremely important industry characteristic accounting for union weakness in pipeline construction is the effectiveness of a wildcat strike which the workers call a "wobble." A wobble usually involves an entire gang or an entire skill group. A mere threat of a wobble often is enough to get what the workers want from the contractor. In any

case the threatened wobble or the real wobble is a very powerful, spontaneous and relatively unencumbered negotiating technique.

It is ironical that the wobble is a contemporary alternative to union action. The technique, and even the word itself, seem to be residual influences of the old International Workers of the World. It may be, as Brooks argues, that "troubadours . . . make notably poor organizers" but the "Wobblies" left the direct action wobble for pipeline gangs and skill groups to use in modern negotiations.

There is little opportunity for workers to identify in terms of loyalty with the multiplicity of locals in which they are members in any given season. There is occasional loyalty to the abstract ideologies of the labor movement or to labor unions in general. Very few workers, however, have developed these abstract sentiments.

The indirect influence of potential unionization may be seen in the frequent statement "we pay union scale or better" or "why should I join the union? I make union scale or better; the union does nothing for me."

The union's role in recruiting is minimal. Occasionally workers and employers make routine checks at union offices and usually the union has a list of workers in a territory. Recruiting by the unions seems to be merely potential to the extent that contractors "butter up" union officials.

"We don't buy them you understand, but I try to stay on the good side of union officers."

FOOTNOTES

¹The most complete account of the process whereby construction contracting companies have become independent is found in:

Larson and Porter, pp. 143-170.

²Eli Chinoy, Automobile Workers and The American Dream (Garden City: Doubleday and Company, Inc., 1955), Cf. Chapter 1, pp. 1-12.

³Winalee Gentry, One More River to Cross (Philadelphia: Westminster Press, 1955).

⁴"Pipeline Personal Notes," Pipeline Construction (August, 1965), p. 63.

⁵"Pipeline Personal Notes," Pipeline Construction (June, 1965), p. 51.

⁶Dean Hale, "Plows, Planted at Record Pace in 1965," American Gas Journal, 193, No. 2 (February, 1966), pp. 38-40.

Raymond D. Lewis, "Pipelining Down Pack Mule Trail," Pipeline Industry (April, 1966), pp. 57-60.

"Offshore Pipelining," Pipeline Industry, 25, No. 4 (October, 1966, Special issue).

⁷Gordan A. Purdy, Petroleum: Prehistoric to Petrochemicals (New York: McGraw-Hill Book Co., Inc., 1938).

Goerge Sell, The Petroleum Industry (London: Oxford University Press, 1963).

⁸Larson and Porter, pp. 297-326.

⁹Purdy

¹⁰Purdy

¹¹"The Triumph of Big Inch-By Inch," Life (Sept. 23, 1963), p. 35.

¹²Sell

¹³The most detailed description of early construction technology is found in Loos.

¹⁴The terms "big inch" and "little inch" originally referred to large and small diameter pipe. But the terms presently are used to describe the size and duration of jobs regardless of pipe size.

¹⁵Max White Ball, This Fascinating Oil Business (New York: The Bobs Merrill Company, 1940), p. 33.

¹⁶Life (Sept. 23, 1963), p. 35.

CHAPTER V

THE PIPELINERS

The term "pipeliners," as it has been used here, is confined to men who work in construction. The term does not include engineers and men who regularly work in pump stations, refineries, and offshore installations, although these individuals are sometimes described as "pipeliners" in the trade literature. The term "pipeliner," as it has been used in the present study includes laborers, semiskilled and skilled workers, supervisors, contractors, and shipping company inspectors. This definition follows usage by pipeliners themselves. The worker term often is "professional pipeliner." The term excludes many laborers who are hired locally for particular jobs, but it includes numerous laborers whose principal occupation is pipelining. Many of the excluded individuals frequently represent different populations. The socio-economic origins of engineers and company officials differ from that of the working class pipeliners. They have little relevance to the patterns of crew formation, job finding, and apprenticeship described in this paper. Their contacts with construction crews are peripheral and occasional. The pipeliner's contacts with the shipping company

is generally confined to those with the shipping company inspector, and the engineers are "long gone" when the construction crews start.

Origins and Characteristics

Pipeliners range in age from 18 to 65 with a median perhaps in the mid-thirties. They are, for the most part, white Anglo Saxon Southwesterners. Negroes, Mexican Americans, and Indians are hired occasionally as common laborers but they are not frequently considered to be "real pipeliners." Rarely are Negroes found in supervisory positions. The few Mexican Americans who work on the pipelines are considerably less than their representation in the Southwest. Access to supervisory positions are not as restricted for Mexican Americans as they are for Negroes. But the "Latins" are not often found in skilled or supervisory positions.

In New Mexico and Arizona, Navahoes have been used in construction jobs but almost invariably they have been given common labor jobs.¹ The population, as noted in the introduction, from which pipeliners are drawn seems to be mainly Southwestern rural. Even in the Midwest, skilled workers seem to be recruited principally from Texas, Oklahoma, Louisiana, and New Mexico. This is especially true in the case of supervisory personnel. The pipeline crews in Michigan and Ohio have a decided southern accent.

The pipeliners come from the same population which included the dust bowlers of the 1930's. The pipeliners like others in the region migrated and, at first, families became fragmented. Anderson has described some of the initial limited attempts of families to remain together when they left the dust bowl to seek work in other areas.² The novelist, Steinbeck, documented the trials of the "Okies" of that period.³ Vogt et al. described the Southwestern population from which the pipelining population is drawn.

The homesteaders (bean raisers in New Mexico) westward migration from the hill country of the Southern Appalachians to the Panhandle country of Texas and Oklahoma and there to the Southwest and California.⁴

Both Vogt et al. and W. P. Webb, the historian of the Great Plains, stress the individualism of the Southwesterners.⁵

Perhaps there has been more emphasis upon the Southwesterner's individualism in social relations than may be justified. The present observer failed to see the "constant fighting tone (which) permeates the economic, social, and religious structure of the community" among pipeliners.⁶ Pipeliners compete for jobs, and for workers, and sometimes they are in conflict with one another. But the pipeliner's economic survival depends upon his close participation in communications networks with other workers. The kinds of interpersonal relations observed, of course, depend, among other things, upon what social systems the observer views.

The Vogt group concerned themselves with aborted attempts of the bean growers to cooperate to develop a land use program, to gravel streets, and to build a high school gymnasium. But, among the pipeliners individualism seems to be more of a boast than a fact.

The rural background of workers is perhaps best seen in pipeline argot; and it is interesting to note that rural terms seem to predominate over the rich military vocabulary to which many of the men have been exposed. A "bronc" on the line is a worker who does not yet "know the ropes"; his rural counterpart is an undomesticated horse. When the worker learns a pipeline skill he "breaks out." When a horse is domesticated he is "broke to ride" or "broke to harness." To quit work for the company is to "drag up"; an expression probably coming from the cotton fields where the cotton sack is dragged up to the weighing scales before the row is completed. When the pipeliners stop work for the day they "go to the house" even though many of them are not going to any house but to restaurants and recreation places. That expression is especially reminiscent of the period in the farm day when the day's work is completed and the farmer actually goes to the house. The word "spread" is commonly used to refer to the land and trappings of a cattle ranch.

Organization and Movement

About one half of the workers are in-group "pipeliners." The remaining workers are "common hands" who are

recruited from towns near a particular job. A few of these remain in the occupation and eventually become "professional pipeliners"; but most of them simply ricochet off of the line. Their net effect upon the pipeline way of life seems slight. Career histories of professional pipeliners seem to follow a pattern of farm labor, military service and pipelining, with occasional forays into outside occupations.

The pipeline way of life like pipeline contracting companies is dominated by time and distance factors in the industry. Life is organized around short term jobs and long distances between jobs. Workers seem to work more often for one contracting company than for others, but because contracts are often short and irregular there must be a great deal of movement between companies. Workers, as well as contracting companies, have made adjustments to contract irregularity. The pipeline way of life is geared to frequent and rapid movement from company to company. The daily life of workers and their families requires nothing that cannot be moved with little trouble.

Most workers with families (of procreation) live in trailer houses. A few of them rent furnished apartments and houses in the spread headquarters towns; and a few leave their families at "home," especially during the public school term. The single men live in hotels, tourist cabins, and boarding houses in the headquarters or nearby towns; and a few live with married relatives. Nuclear families frequently

remain together especially during the summer when children are not in school. But keeping children in school splits many families during the school term. Indeed, in many ways ad hoc groups of kinsmen are more cohesive than are nuclear families.

The workers and their families establish a few acquaintances in the towns at which they stop; but for the most part close friendships are restricted to other pipeline people. Groups of families tend to cluster together in the different trailer parks in a town. These groupings often represent combinations of kinship and friendship. This gives the appearance of cliques of families rather than of individuals.

The pipeliners' relationships to the communities in which they work is one of indifference more often than mutual hostility. Pipeliner linkages to the community are largely instrumental--through service stations, restaurants, trailer parks, rooming houses, and a few other types of service establishments. The pipeliners see themselves somewhat correctly as perennial outsiders in the communities in which they live for brief periods of the working season. Tradesmen are able to exploit the pipeliners in at least minor ways so that they sometimes feel that they must be on guard constantly "to keep from getting screwed."

The pipeliners' marginal status in the communities is reflected officially in trailer park zoning ordinances.

It is reflected socially by community indifference. This marginality helps to cause pipeliner groups, whose members are scattered over the country, to be the most important, socially as well as economically, in the pipeliner's life.

In the "heavy season," during which contract awards are at a maximum, the pipeliners usually work ten or more hours per day, often seven days per week. The heavy season is approximately nine months long in the Southwest where natural gas resources are being rapidly developed. During the slack season when there is little employment for the workers they seem not to apply their skills in other closely related occupations. Rather than "fool around the house" they work on personal property or private equipment. This is doubtless due largely to the slackness of a need for skills in all related occupations at the same time. However, a part of the reason may be the absence of reciprocal connections--of exchange relationships in other industries. "Hell, I don't know nobody on road work." "I'd rather set around the house than work on them 'turd lines' (sewage systems)."

The hourly earnings of pipeliners are high but their expenses are great. Travel itself is probably the greatest single expense of the pipeliner. Housing would no doubt run a close second and indeed, for many workers, it is the most expensive. Trailer houses (euphemistically called "mobile homes") cost from four thousand to twenty thousand dollars.

The pipeliner ordinarily is seen in a trailer which sells for six to seven thousand dollars (the two or three bedroom type). The trailers are much more expensive for pipeliners than the trailer sales company advertising would indicate ("own your own home outright in seven years"). But this is partly due to the pipeliner's tendency to live in fairly new trailers. Their trailer houses depreciate at approximately the same rate as do automobiles. Banks discount the loan value of trailers to zero in five to seven years.⁷ The resale value drops as rapidly. Trailers and automobiles are one of the few ways that workers can exhibit their success in the communities where they have little local identity. Despite high cost and some inconvenience, the trailers usually are spacious and comfortable. The design and construction of these houses has improved vastly over the past twenty years. They are very different from the cramped inconvenience of the trailers at Willow Run during the years of World War II.⁸

Much of the pipeline way of life can be seen as a collective and individual struggle to maintain power and influence, and above all, to maintain advantage in the pipeline labor market. The pipeline construction labor force is informally organized as a set of networks of more or less fluid social coalitions among individuals and groups. These are characterized by exchange obligations among members. Such networks are enhanced by the cohesiveness produced by

community isolation. Thus the pipeliners are especially attuned to rumor and they are sensitive evaluators of word of mouth information. Rumors, an important source of information about new jobs, can be checked out. The communication system within the labor force can be described as one of decreasing error in rumor as the pipeliner makes use of his "contacts." Shortly after it is heard, a rumor is verified, discounted, or modified as a result of checks made with other pipeliners.

Except for the "common hands" who are hired through local employment agencies and from "off the streets," workers are recruited by way of informal networks which extend at least throughout the Southwest, and most of the time into Canada. One worker boasted, "there's not a job going within three hundred miles of here that I don't know somebody working on it." In watching this informal communication system at work one is reminded of a line from a "hillbilly" song which was popular in the Southwest a few years back: "Hey Okie, if you see Arkie, tell him Tex has got a job for him out in Californy." Workers may be hired through phone calls or letters between themselves and friends and relatives at the job location or through direct phone calls to the contractor, spreadman, or foreman.

Pipeline Construction (formerly The Pipeliner), a trade magazine, publishes information on jobs in progress and on proposed jobs. The descriptions include the names of

spreadmen and foremen. These lists of names are important because most of the named supervisors are fairly well known in the industry and have different reputations. Although the magazine often contains information that is already known to in-group pipeliners. "Who has the dope" (who is the dope foreman) or "who has the pipe" (pipe gang foreman), etc., and "who all are going up there" are important questions for pipeliners when they seek jobs. When a worker obtains information from the magazine he usually has borrowed a copy. Indeed, a fairly accurate sociogram might be drawn from fingerprints on well worn copies of The Pipeliner.

In his evaluations of workers and in his attempts to recruit crews the spreadman often thinks of groups of kinsmen ("bunches") and of cliques rather than of individuals. "Them _____ are good workers" or "I won't work that bunch unless I have to."

Occasionally, a bunch will dominate a single work gang, although the members of a kinship group are likely to be spread out over the entire spread or among several jobs. One "dope gang" has as its foreman a man whose entire crew was made up of sons, sons-in-law and a few friends of these. The entire gang, consisting of both kinsmen and nonkinsmen, was cohesive. Horseplay on the job was extended into social relations among the workers after the work day. The leader of a bunch (the man who is contacted by an employer) is not often a family patriarch. He usually is a younger man who

hires his father, or father-in-law, or who helps other relatives to find jobs.

In many instances, hiring a bunch is inappropriate, or such bunches are not available when they are needed. Nevertheless, the spreadman or foreman who is seeking workers usually contacts people who can contact other workers. Thus, a spreadman who contacts a single individual often sets off a chain of messages and inquiries which may result in the formation of a gang, or even an entire crew.

Bidding, Contracting, Recruiting,
and Job Finding

The bid for a particular job is planned by officials of the construction company and the crew is recruited through kinship and friendship contact networks. The bid planning begins well before the shipper advertises specifications for contracts, and a "hearsay" stage precedes the remainder of the process. The hearsay stage of the bidding process includes published Interstate Commerce Commission actions, published tentative construction proposals, and word of mouth information about upcoming jobs. The pipeline shipping company, after securing the right of way, then issues public invitations for construction contract bids, and it makes specifications available to interested contractors. The specifications later become a part of the contract.

The shipping company evaluates the contracting companies which have submitted bids in order to determine

which of the bidding companies can actually complete the job and which of them may be "biting off more than they can chew." The lowest bid is accepted from among those submitted by the remaining qualified companies.

During the hearsay information period the contractor rules out several potential jobs while considering others. His shifting depends upon the size of a job, the amount of equipment needed, the distance between his company's present job to the next, and the potential availability of workers. The choice of the area and considerations of distance are important for contractors when they sift the possible jobs because long distances multiply costs rapidly.

If the contractor thinks that he can handle the job and earn a profit he will begin to prepare his bid. During the bid preparation period, the contractor estimates footage costs and he determines the amount of profit which the company wants to earn. The contractor studies the shipping company's engineering reports and the construction company may have on its staff or it may hire a consulting engineer to help prepare a bid. The contractor and his key men are very likely to look over the terrain and to make forecasts regarding special problems. Such problems include the possibility of solid rock which must be removed, loose sand, quicksand, and other problems along the right of way. Next, the contractor estimates his labor force requirements, and he calculates the likelihood that the number of workers he absolutely must

have will actually be available. The planners for the bid almost always include the general construction superintendent and the spreadmen.

The likelihood that contracting company supervisors below the level of spreadman will participate in bid preparation decreases, depending upon their positions in the supervisory hierarchy and upon the likelihood of particular problems which are expected on the job. Bid planning often includes the "pipe gang" foreman since the pipe gang is more likely than other gangs to encounter special problems. Other gang foremen may participate in the bidding but the hierarchy of probability of bid participation is as follows: general superintendent, spreadman, pipe gang foreman, and finally other gang foremen. This supervisory participation in the bidding process is an important source of "inside dope." Such participation makes available to bid participants detailed knowledge about personnel needs and therefore, information about available jobs. Such knowledge is an important negotiable commodity among pipeliners.

Actual recruiting follows a familiar pattern. When the work on a contract is begun the spreadman is likely to know a few workers who know about the job, and he will know how to contact others. Some of these workers will furnish information about other workers, and if the contacted person is a foreman he will hire other workers. The spreadman will "hang around" the office or warehouse an hour or two during

each of the first few days of the job to phone and receive calls. A few days before and a few days after a job begins married workers come often by auto, pulling trailer houses. Single workers, and those who do not bring their wives and children along find rooming houses.

When a worker arrives in the spread headquarters town he has little trouble finding the warehouse or the "greasy spoon" where the workers drink coffee before going to work. He soon joins other workers, all of whom have been recruited within a matter of hours. Although they will have come from places scattered over thousands of square miles, they usually know one another. Within a few days or weeks they will scatter again.

Table 1 illustrates the time and distance conditions which the industry imposes upon both workers and construction companies.

Contracts vary from one or two days to six months or more but the typical job requires a full skilled labor force for an average of three weeks. Distance from one job to another may be within one area such as a large gas field, or between such areas. Often, jobs may be separated by several hundred miles. Time lapsing between contracts is an important determinant of whether or not a contractor can hold workers. Frequently, contractors have no work at all.

Table 1. Time and distance during mid-season for one medium sized company, Amarillo, Texas. Summer, 1955.

Place	Time on Job	Distance to Next Job	Time between Jobs
Amarillo, Texas	3 weeks	Approx 200 miles	10 days
Hooker, Oklahoma	2 weeks	" 60 "	4 days
Liberal, Kansas	4 weeks	" 100 "	4 days
Sidney, Nebraska	2 weeks	" 150 "	6 days
Burlington, Colo.	1 week	" 70 "	14 days
Amarillo, Texas	5 days	" 260 "	12 days
Lubbock, Texas	3 weeks	" 115 "	3 days

The contractor who plans to operate a spread of approximately one hundred men does not need all of the men at the same time. He will have a few days to form his crew after the job starts, but he will need a full crew within a few days. The "right of way" gang needs to complete much of its work before other gangs can begin. The pipe stringer gang must have the pipe joints at the right places along the right of way before the pipe gang can begin. The pipe gang must have enough head start on the welders so that the welders will not be idled (at individual salaries ranging from \$8.50 to \$11.50 per hour). The welders must be far enough in front of the dope gang so that the pipe joints in the welding area are not "jiggled" by the dope machine.

The fact that all of the workers on the spread do not have to be recruited at once gives only slight leeway to the contractor and his supervisors. The few who are needed at first are "just the right men at just the right time." Even if the company could hire a full crew all at once to "keep on ice," such a reserve labor force would be too costly in most cases. The contractor often can and does, in some cases, pay "waiting time," but ordinarily waiting time is confined to supervisors and to key skilled workers.

The transferability of workers is an important factor in crew formation. A worker can be transferred from one gang to another depending upon his particular skill. Transferability is roughly inversely related to the skill hierarchy. Laborers can be used in all of the gangs. This does not mean that all of the laborers can expect to be employed throughout the contract. In fact the need for all levels of workers increases until the pipe gang finishes its work and then the need for all skills decreases. But some workers can expect longer employment as a favor from supervisors.

From the middle to the end of the job, the supervisor is in a position to pay off favors which he has incurred, and he is able to obligate pipeliners to himself for possible use when workers become hard to find. That is, the supervisor can both "pay off debts and put money in the bank" by the retention of some workers for as long as he can keep them busy.

Table 2 shows estimates of the labor force needs of a two week "average" job in Northern Ohio, summer, 1966.

The estimates were made by the company's bookkeeper.

Table 2. Estimate of the number of days each gang can expect to be employed on a 12 working day job.

Day from beginning of job	1	2	3	4	5	6	7	8	9	10	11	12
Gangs Needed:												
Right of way	x	x	x	x								
Stringing		x	x	x								
Ditching			x	x	x							
Pipe				x	x	x						
Bending					x	x						
Hot Pass Welders					x	x	x					
Firing Line Welders						x	x	x				
Dope							x	x				
Lowering in								x				
Backfill									x	x		
Clean up									x	x	x	x

Selective retention of workers by transferring them from one gang to the next is not only the principal way in which a supervisor can reward obedient and loyal workers, it is the way he can favor relatives and friends. During the busy mid-season a supervisor can lure workers in a variety of ways. He may lend them trucks with which to pull trailers, or he may lend them a variety of other equipment. More important, the supervisor can make available his knowledge of future jobs or his contacts with other companies in exchange for the worker's willingness to "get him out of a tight."

Before a job is begun, the pipeliner has available to him the "scuttlebutt" which is always present, and the listings in Pipeline Construction. Neither gives him the reliability which he needs when moves are distant and costly. Consequently the worker often depends upon a friend, relative, or acquaintance whom he believes to be reliable. When the worker receives a job offer, he also seeks trustworthy estimates of length of job, overtime, and information about other work about to start in the area. The amount of pipelining in the area is an important determinant in the attractiveness of the job. Many jobs in an area means that the pipeliner can shorten the time and distance between future jobs.

The industry is characterized by a labor force supply-demand cycle. The cycle is important in determining both the availability of jobs for workers and the availability of workers for construction companies. Most of the work is done during the "season" from about March through December. The greatest industry need for workers occurs during the summer months. The need is small at the beginning of the season, increases up to early summer, remains constant until late summer, and then diminishes. The consequences of this cycle for the industry, construction companies, and workers, are clear. Jobs are scarce for workmen near the beginning and end of the season, while the contractor can find workers easily. During the middle of the season, workers are scarce

and pipeliners can "set in just about anywhere." During the summer months, workers are able to "pay off" their obligations to supervisors by making themselves available for work; in spring and autumn, supervisors can pay off their obligations to workers by keeping them as busy as possible.

FOOTNOTES

¹Sasaki.

²Anderson.

³Steinbeck.

⁴Evon Z. Vogt and John M. Roberts, "A Study of Values," Scientific American, 195, No. 1 (July, 1956), p. 26.

⁵Walter P. Webb, The Great Plains (New York: Grosset and Dunlap, 1931) pp. 227-243.

⁶Vogt, Scientific American, 195, No. 1 (July, 1956), p. 27.

⁷Arch W. Troelstrup, Consumer Problems and Personal Finance (3d ed.; New York: McGraw-Hill Book Co., 1965), pp. 267-78.

⁸L. J. Carr and J. E. Stermer, Willow Run (New York: Harper and Bros., 1952), pp. 89-110.

CHAPTER VI

LABOR FORCE DYNAMICS

A description of the labor force, no matter how detailed it might be, cannot explain how the workers are distributed and redistributed throughout the season among dozens of construction companies. The present chapter attempts to describe the dynamics of the pipeline labor force--the organization within the labor force itself which accounts for much of the unofficial (but job related) behavior of pipeliners at work, in crew formation, and in skill training. The principal questions are: (1) How does a construction company, whose total staff at the beginning of the season consists of the contractor himself, a spread superintendent, and a bookkeeper, manage to have up to two hundred men working for him within a few days? (2) How does a pipeline go about getting what he wants from an industry which is scattered over the North American Continent?

Pipeline labor force movement becomes understandable when it is viewed as consisting of workers bound together by mutual but informal obligations to one another. The formation and persistence of these interpersonal networks becomes understandable only within the contexts of the industry,

the operating spread, groups of kinsmen, and friendship cliques.

The industry itself affects labor force movement profoundly by the time and distance conditions which characterizes the construction season. The season begins late in March or early in April and ends about the first of January. Some pipeline work is done the year around especially in the southern half of the United States, and a few construction jobs are done in winter by preference. In parts of the Midwest and in Canada some jobs are deliberately put off until swamps are frozen. In these few cases the convenience of a firm working surface outweighs the disadvantage of cutting through frozen mud. Despite these specialized exceptions, however, most pipeliners can look forward each year to a stretch of two months or more of unemployment.

The Labor Supply-Demand Cycle

The number of skilled, semiskilled, and unskilled workers who make up the pipeline labor force is fairly constant. Some workers leave the industry, and a few are recruited and trained each year. Nevertheless, the labor force is relatively constant in numbers, whereas the need for pipeliners is cyclic. The heaviest part of the season, from early May through September, marks the greatest need for skilled workers. During that time, contracting companies usually want more help than they can actually get, and there

is an abundance of jobs for workers. From October through January, however, the available number of skilled workers in the labor force begins to exceed the contractors' needs. During the light part of the season, when many workers are available, it would seem that the construction supervisors could select only the very best and "loyal" workers from among those in the labor force. It would seem, likewise, that during the heavy part of the season the workers should be free to take only the highest paid job, the longest job, or the job with the most overtime. The catch, however, is that in a few weeks the supervisor will be required to ask workers to work for him as a favor. And the same seasonal conditions of the industry restrict the worker's freedom to take only the most attractive jobs. The following editorial is slanted in favor of construction companies rather than workers. But it gives a good illustration of the influence of the cyclic pipeline season in mid-season.

Late last year, it became apparent that pipeline construction work would again be of the "bits and pieces" variety; short loops, many jobs, and all companies in a rush to get their pipe in the ground and in service. Though such developments were foreseen and anticipated by contractors, manufacturers and suppliers, the number of jobs was underestimated.

Between June 13 and July 21, Pipeline Construction tabulated 79 new construction projects awarded to pipeline contractors. In the June issue, we reported, in addition to new contract awards, 124 pipeline projects in various stages of completion in the United States and Canada. Above figures do not include pipeline construction abroad.

As such contracts have developed, it has focused attention even more sharply on chronic soft spots in the pipeline construction industry. Of these, the

most serious is the lack of skilled pipeline workers. Based on reports from virtually all jobs, a good pipeliner can set in just about anywhere he wants to work. Welders, office help and "swing" operators are needed badly. Tie-in and lower-in foremen and mechanics are hard to locate. Some contractors, we understand, are operating with about half the number of welders needed. Competition for a limited number of workers will drive labor costs up.

Yet, bid prices for pipeline construction continue to drop. One contractor mentioned to us that his firm bid on a job in Pennsylvania, was third from low. This in spite of the fact that the bid was 10 cents per foot less than the price for the same size job, in the same area, that his firm did in 1957.

Thus, in spite of the volume of work under contracts, most contractors are able to bid additional work. When contractors become loaded with work, bid prices go up. But because of the short length of the lines and the rush to get them in, contractors are forced to keep their work load up with sheer volume. To do this, they feel they must bid lower and lower against their competition.

Equipment, material and labor costs are up. Yet prices for pipeline construction continues to drop. Increased production, per dollar spent, has made up the difference in most cases. But contractors say they have reached the limit of such economies.

The long-range forecast for pipeline construction calls for more of the same "bits and pieces" with an increasing volume each year. In 1966, worker shortages, lower prices, and a scarcity of construction equipment will be worse than it was in 1965. It will become progressively worse each year until some treatment for these chronic ills is found.¹

The labor supply-demand cycle affects large and small companies in almost exactly the same way with respect to recruiting. Although large and small companies do not often compete for the same contracts, companies of all sizes compete for workers because they have the same problems in bringing men and equipment together at the right place at the right time. Once any job starts, very expensive machines

are either used or remain idle, depending upon whether or not there are workers to operate them. Even the large contracting firms who own most or all of their equipment can ill afford not to use it. The unmanned machinery might have been rented to other companies for high fees. The principal effect upon the large company of the short supply of manpower during the heavy part of the season is lost income. Whereas the principal effect upon the small company of an inadequate labor supply often destroys the company. A few days or hours of idle machines, rented at high fees, can bankrupt the small company.

Because of the time and distance characteristics of the industry, the pipeline labor force is necessarily fluid. A few pipeliners remain, or try to remain, in a small part of the American Southwest, and a few refuse to travel farther than a few miles from "home." Just the opposite are those pipeliners who prefer to travel as much as possible. They are "always looking for work in Arabia or Canada." Most of the workers, however, neither stay at home nor travel for the sake of travel. Rather, they travel in order to earn as much money as possible throughout as much of the season as possible.

Despite the necessity of frequent travel, the national "community" of pipeliners know each other about as intimately as do the members of a small but ecologically coherent community. "Hell, I know somebody just about

everywhere." Several features of the pipeline way of life other than common occupation help to sustain this in-group identity. First, despite frequent separations by great distance, the pipeliners just as frequently remeet on this or that job. No two successive crews are identical. The fluidity which scatters pipeliners over the continent also brings individuals together again and again. Secondly, the pipeliner and his family are largely isolated socially in the communities where they live for brief periods. They are treated with indifference rather than hostility in most cases. (There are of course exceptions such as a situation in which the pipeliner rents a house in an expensive neighborhood and parks his welding truck in front of it each evening for several weeks.) The pipeliner's contacts with members of these communities are largely secondary; his primary contacts generally are confined to other pipeliners. Finally--and this is a central argument of the thesis--the pipeliners must know each other fairly intimately in order that the labor force might be distributed among the various companies throughout the season.

Most pipeliners think of themselves as "from somewhere." There is always a "back home," a town to which the worker returns when the season ends for him. But except for "old acquaintances" he is almost as isolated back home as he is in the communities in which he spends only a few weeks. The pipeliner often sees his back-home status and his status

in other communities as "pipeliner" at best, and "migrant worker" at worst. The only way he has to distinguish himself in either of these communities is through ownership of expensive consumer items.

Occupational Contact Networks

Sets of relationships among pipeliners which may be called "occupational contact networks," are the principal organizing and dynamic characteristics of the pipeline labor force. The term "occupational contact network" was used by Katz to describe an informal system in which professionals found jobs and in which firms found professionals.² Other writers have described similar job finding-recruiting networks in several different kinds of organizations.

The pipeline contact networks consist of relationships among people who are associated with one another through mutual aid obligations. The obligations are found among kinsmen, friends, and former friends, and they center largely around recruiting and job finding. The relationships may be sustained at a fairly intimate level, or they may, after a while, be reduced to the level of mutual economic exploitation, a type of relationship which Katz called "other directed friendship."³ The contacts are exploited when a worker wants a job or when a construction company supervisor needs workers.

Kinship Organization in the
Pipeline Industry

Although many pipeliners have no kin relations at all in the industry, kinship as a basis for mutual aid among workmen is quite apparent within the industry. Pipelining favors groups and networks of kinsmen who are more or less economically dependent upon one another. The kinsmen help one another to find jobs and to recruit crews. Less frequently, they lend each other money, automobiles, and trucks for moving. And, often for short periods of time, they live with each other.

Mutual aid among kinsmen takes two different forms in the industry. The most common pattern is that in which several workers, who recognize each other as "kinfolks," are dependent upon, and obligated to one another. The individuals may or may not travel together and work on the same jobs. Whether they do or not depends upon the particular job. They are often separated, but they generally know how to get in touch with each other within a few hours. They are aware of their work related dependence upon one another, but they ordinarily are not recognized as "bunches" by other workers. These networks of individuals usually include non-kinsmen.

The second pattern is that in which a genuine group of kinsmen travel together and work together, usually on the same spread or gang. The groups recognize themselves as bunches, and they are recognized as bunches by others. Although the bunch may contain group members who are not

kinsmen, it is either identified by a surname (the Jones bunch) or simply as Charlie's bunch. The bunch is a genuine social group. In addition to identity, bunches are characterized by group goals and an internal division of labor.

Both the pairs of individuals and the bunches consist of individuals who recognize mutual kinship. Recognition of kinship, beyond one's wife and children, seems not to include particular behavioral prescription among categories of kinsmen. Both the networks and the bunches consist of such combinations as two or more brothers, cousins, brothers-in-law, fathers and sons, grandfathers and grandsons, and combinations of these.

Bunches, because they work and travel together, are more available for direct observation than are the most geographically scattered kin networks. The most likely possibility, in any given case, is that the members of the bunch will be found working in several gangs of a spread, but they often are found to be concentrated in "right of way," "dope," or "clean up." Technical requirements are less stringent in these gangs than in others; mistakes can be more easily corrected or disguised. Following is a brief description of what seem to be fairly typical examples of bunches and their relationships to the industry.

The Jennings bunch (a pseudonym) was organized around a clean up foreman, the "old man." The old man's bunch consisted of himself, a brother (laborer), a brother-in-law

(laborer), a son (tractor operator), and a son-in-law (tractor operator). The members had worked on the same spreads for a single company throughout two seasons at the time the observer knew them. All of the bunch members could and did work on the clean up gang for only a few days on each contract. But they were used throughout the duration of each contract because they were transferred from gang to gang. This was easy to do because laborers and operators can be used in most of the gangs.

The result of the spreadman's willingness to keep the Jennings on resulted in their being able to work throughout most of each contract, and therefore to stay together. Members of the bunch, despite their preferential retention, probably did not work as consistently or earn as much money as they might have had they moved more often from company to company, but they chose to avoid the problems of much travel. The company made certain of a cleanup gang when it was needed, and the old man could "handle" property owners. "They (farmers) come out on the right of way mad; before he (the old man) gets through with them they're telling him where the watermelon patch is."

The bunch described above, because its members exceeded the number of workers needed on a clean up gang, and because the clean up gang is needed for only a short period of time did not often work directly under the old man. Their advantages, however were due mainly to his special

relationship to the company, not theirs. A second bunch (the Smiths), however, usually did work in a single gang, the dope gang. The central individual in this gang (the foreman) usually had a crew consisting of two of his sons, two sons-in-law, a brother, and two "friends of the family." This bunch not only worked together in the same gang, they usually did not work in other gangs when the dope gang had finished. Technically, they could have, since only the dope and cleaning machine operators, and the "pot fieman" had exclusively dope gang skills. The dope gang, however, ordinarily takes longer to complete its work than does the clean up gang. Consequently, an entire dope gang can move from company to company without losing nearly as much work time as would the clean up gang if the latter only worked on clean up.

Bunches on gangs, other than right of way, clean up, and dope, seem to be less prominent in the industry. And when individuals on more technically demanding gangs such as "pipe," and "welding" are identified as a bunch they seem rarely to number more than two individuals although several such pairs can be identified.

Most of the time, bunches are labeled with a family name, and the name more or less accurately describes the group. Occasionally, however, a bunch will be larger than the typical ad hoc kin group, and it will be identified with a town or a geographic location. The area around Lansing,

Michigan, it is reported, gets most of its crews from Tennessee, whereas 35 miles south in Jackson, Michigan, crews are reputed to consist mostly of Texans. The most striking example of a bunch identified with a place is found further north in Central Michigan. Dope gangs in the area are identified as "Bald Knobbers" because the gangs come to Michigan each summer from Bald Knob, Arkansas, a city whose 1960 population was 2,096. Several Bald Knob bunches have worked off and on in the area for several years. Local company officials probably exaggerate somewhat when they say that "all the dope hands come from Bald Knob," but the following statement seems to be fairly accurate. If you need a good dope man (foreman) and you can't find one around here, there usually is somebody in Bald Knob who can help you out."

Bunches are a frequent type of informal group in the industry. But most of the particularism which is relevant for the industry occurs among pairs of individuals. These pairs may or may not consist of kinsmen, but the paired individuals have built up a set of mutual obligations to one another.

Labor Force Allocation: The Dynamic Problem

In order to understand the complicated set of adjustment which workers and companies make, it is necessary to examine the minimum needs of contracting companies and the job related wishes of pipeliners. The officials of a contracting

company, first of all, need enough technical knowledge to bid wisely and to organize the work efficiently. Beyond this, however, the contracting company needs the following: At the beginning of a contract, the contractor needs a crew of workers in fairly precise proportions of various skills. A few days before each job, the spread superintendent may be the company's only full time employees other than the bookkeeper (who may be the contractor's wife). Even in the largest companies, the construction crew may number no more than three or four individuals at the beginning of each contract. It is the job of the one or more individuals to recruit a crew rapidly.

The company not only needs a crew with the appropriate skills but it needs a loyal crew. The company's supervisors need to be able to depend upon the workers to remain on the job until it is finished and to cooperate with him in his competition with competing companies and in his company's frequent conflicts with unions, inspectors, public officials, and property owners. One of the persistent dangers to the company with a full crew is that word will get around that another company is permitting more overtime. ("You take some of these bastards will drag up the minute they smell a little overtime.") Frequently, the only thing that will keep workers from quitting to pursue overtime is whatever personal loyalty the supervisor can command. The loyalty which is useful to the company usually is to the person of

the supervisor, not to the company. A company which cannot use a crew for more than a few weeks or a few days can hardly engender loyalty in its workers.

The supervisor needs a minimum of authority. His official authority, of course, is clear. Workers know who is in charge and they recognize the authority as legitimate. Legitimate authority, however, rests upon consent, and the pipeline supervisor's authority is potentially weak because of the short time in which he has official control over workers. A worker who, during the heavy season, is dissatisfied can quit without losing more than one or two days work; he will lose no more time if he is fired. One of the most frequent worries of supervisors is the mass "drag up" in which a large portion of the crew or gang stops working. The supervisor's problem is, then, one of how to buttress his official position sufficiently to successfully command the efforts of a crew. The short supply of workers during the heavy season not only makes workers hard to find but it also makes them hard to control on the basis of the supervisor's official position alone.

Time is a persistent preoccupation of the workers. When pipeliners are asked about what kind of a season they want, they very often mention certain places they would like to go. But the most frequently mentioned characteristics of a good season are in the order of their importance to pipeliners: (1) plenty of overtime, (2) jobs of long duration

(two or three months), (3) little lost time between jobs, (4) the shortest distance between jobs, (5) a long season, and (6) good bosses, "the kind of man you like to work for."

Overtime is a constant concern of pipeliners. The observer once asked a worker to tell him the difference between a "professional" (or real) pipeliner and a non-professional "hand." He answered: "when he (the pipeliner) goes crazy over overtime." The observer recalls once during an especially difficult river crossing when the "summertime college boys" complained about the long hours; two of them "drug up." No complaints, however, were heard from the "professionals." In fact they seemed to exhibit some exhilaration, expressed in increased horseplay despite great fatigue.

Often companies are compelled to grant overtime in order to keep crews until a job is finished. Some contractors express fear that "overtime is going to get out of hand." The following editorial expresses this fear:

In his message, President Johnson said that imposing a double pay penalty after 45 hours' . . . would bring a significant increase in employment . . . without impairment of operating efficiency . . . by distributing to new employees work which presently is performed through excessive overtime!

Undoubtedly this proposal will be welcomed by a large segment of our circulation list, those who work for various contractors on an hourly basis. Their initial thought will be that this will mean more money in the pay checks each week.

That first thought is deceptive. As in virtually every pie-in-the-sky proposal submitted by dreamy eyed, unrealistic workmen on the payroll of the chief social arbitrator of the 'Great Society,'

there's a big fishhook hidden in an attractive gob of bait.

The pipeline workers would suffer. Their pay would drop, drastically, because pipeline contractors would cut down the working hours to stay within the time allocated. Pipeline companies would not construct many new facilities with contract labor.⁴

During the summer months (the middle of the season) the worker has a great range of choices for jobs. Rarely is a skilled pipeliner without work during this period. At the beginning of the season, he has decreasing difficulty and near the end, he has increasing difficulty finding jobs. The worker sees his main economic problem for the work year to be that of squeezing as much work time out of the season as possible. He knows that he can usually expect to be without work for two winter months at least. He also knows that time between jobs and time spent in travel will reduce his actual paid working time to less than six months of the year.

Uncertainty is constant companion to the pipeliner. Each season may bring large incomes, but it also brings huge expenses. Many of the pipeliners find it necessary to maintain two residences. Wives and children may remain back home while the pipeliners live in a variety of rooming houses, apartments, and motels. Or they may keep their families with them. Housing cost here may exceed three hundred dollars per month, especially since pipeliners buy and trade mobile homes in much the same way they buy and sell automobiles. The trailer is traded in within three or four years after it is bought. Since the mobile homes depreciate at a rate of only

slightly less than that of an automobile their trade-in value drops rapidly. Hence a mobile home which costs \$6,000 new may be worth \$3,500 to \$4,000 only a year later. Food, very often, is more expensive for the pipeliner than it is for other people. The worker often eats two meals daily in restaurants. If his company does not furnish "jungle lunch" at noon, he will often eat three.

The pipeliner's earning power varies from year to year, depending upon the kinds of contracts awarded for a particular year. But his earning power is increased if, through his contacts, he can complete the season within a radius of one or two hundred miles. If he can reduce the distance between jobs he can reduce much of his expenses.

Although the pipeliner can be almost fully employed throughout the summer, this does not guarantee that he will be able to work overtime. Contracting companies do not like to pay overtime although they often are compelled to do so in order to meet construction deadlines, to make up for incomplete crews, to get the pipe in the ground before the "snow flies," or (during the heavy part of the season) to hold crews. Labor unions discourage overtime because it reduces the number of workers needed. Workers, however, know that they can increase their earnings greatly through overtime. Overtime permits the pipeliner to allow for many contingencies. There is, for example, no sick leave pay unless the worker can claim workman's compensation for injuries

received on the job. Table 3 indicates the worker's stake in overtime.

Modern technical innovation seems to be cutting down the length of time spent on each job and the amount of overtime which is available for some workers. For example the most transferable worker on the spread, except for general laborers, is the tractor operator. He may work in several different gangs on a single contract. When the pipe gang has finished its work, he can transfer to the dope gang then to one of the other gangs. However, the increasing use of helicopters in mountainous areas is reducing (not replacing) his skills in the stringing of pipe.⁵

Exchange

In order to understand the movement of the pipeline labor force, it is necessary to view it in terms of its own organization. The informal systems involve workers, construction company supervisors, and shipping company inspectors, all in sets of reciprocal relationships with one another. It is through these sets of relationships that the pipeline labor force becomes distributed among the many companies operating in the industry. Informal organization within the labor force centers around the worker's attempts to exchange his skill, and his loyalty for "good jobs," and around the supervisor's willingness to grant special advantages to workers in exchange for "good work," loyalty, and

Table 3. Wages for five skill groups for forty, sixty, and seventy hour weeks. Based on wages paid by one Michigan company in Southern Michigan during the summer of 1966. Data furnished by accounting office.

Skill Level	Hourly wage	Hourly overtime wage	Hourly double-time wage	Forty hour week	Sixty hour week	Seventy hour week	Difference between forty & seventy hour week
Welders	\$8.50*	\$11.25**	\$14.00	\$340.00	\$452.50	\$592.00***	\$252.50
Tractor operators	3.50	5.25	7.00	280.00	332.50	402.50	122.50
Machine operators	3.00	4.50	6.00	120.00	165.00	225.00	105.00
Welder helpers (labor)	2.50	3.75	5.00	100.00	137.50	187.50	87.50
Laborers (other than welder helper)	2.25	3.375	4.50	88.00	121.75	166.65	78.75

*The welder's hourly wage consists of \$4.50 for his labor and \$3.00 rental fee for his welding rig.

**Overtime and double-time are paid for the welder's labor only. The rig fee remains the same.

***Double-time is paid for Sundays and holidays.

support for his authority. Many things, of course, are exchanged by pipeliners as well as by other people, such as respect, privacy, and affection. Among pipeliners, however, many exchanges, while not involving income directly, are nevertheless ultimately negotiable. The pipeliner, if he is to "make any money," must seek advantage in an alternately expanding and shrinking set of opportunities for income. The company supervisor, likewise, must actively seek continuing alliances with workers, and groups of workers in order to insure himself an adequate crew during periods in which jobs exceed workers.

The worker feels at least a minimum responsibility to the company and he usually can be depended upon to carry out most of his job assignments efficiently. Pipeliners take universalistic standards of competence seriously. Abstract sentiments of duty, however, do not insure the degree of power which supervisors actually need in order to muster crews. The authority which construction companies grant to their supervisors does not extend beyond a single contract. The supervisor's official ability to reward and punish workers gives him authority on a particular job, but in itself it does not give him access to needed workers when it is time to man crews during the heavy part of the season. The supervisor can acquire the power necessary to run his spread or his gang through his involvement in systems of exchange which characterize the whole pipeline labor force.

Likewise, the worker must depend upon his involvements in interpersonal networks as well as upon his skills and his willingness to submit to legitimate authority.

The networks originate in a variety of extra-industry relations--kin ties, friendships, and others. But, the worker's informal relations usually eventually become bargaining relationships. Hence, bargaining seems to be the principal dynamic pattern of exchange for most of the behavior of the pipeline labor force. The most conspicuous concrete expression of the networks as bargaining systems can be seen in (1) the interpersonal behavior of workers in the day to day schisms and coalitions which characterize the operating spread. Worker actions may conflict with the company at times and support it at times, or groups of workers may be in simultaneous cooperation with and conflict with the companies at the same time. (2) A more elaborate and durable set of exchange patterns are those through which crews are formed. It is through these that supervisors recruit workers, and workers find jobs. (3) The most durable pattern of all is the informal apprenticeship system--a process which necessarily involves the trainee in prolonged network relations.

The following field descriptions illustrate patterns of schism and coalition as these are exhibited from day to day.

Schism and Coalition

The current job was almost completed and the next job could not be started for several days. The contractor had decided to lay off the men rather than to pay them waiting time; possible because this was during winter slack season when workers were easy to hire. On the day when the workers heard this news the welders held two spontaneous meetings. The first of the two meetings was concerned with the possibility of blocking the lay-off through the union. The union steward said that he thought the union could do nothing since the contractor would not have an active contract when the current job was completed. One of the welders, directing his remarks to the union steward who was an avowed "union man," said: "yeah, that's the way it is, the union knows what to do when it comes time to pay dues, but when you need help, you can go to hell as far as the union is concerned." The union steward only shrugged his shoulders and went back to his rig. The "flare-up" broke up the first meeting and the men resumed work. Later in the day, however, the union steward came to the welder who had made the derogatory remarks and said to him: "I'll check with the union tonight but I don't think it will do any good; it's like a contractor wasn't even in business if he don't have a contract." The other welder replied: "Yeah, I just popped off." Meanwhile the other welders had come up to the pair and the conversation, at first a catalog of the faults

of the contractor, soon turned to other topics unrelated to the conflict. The rate at which the welders ordinarily worked began to slow down perceptibly.

What the welders did or talked about after the day's work is not known, except that the steward called a union official who confirmed his own belief about union power in the conflict. There was some speculation among other workers however which indicated much concern by management regarding the possibility of a "wobble." The spreadman was heard to say that he would never hire any of the welders again.

The next day all of the welders reported for work but their progress was conspicuously slow. Often after each weld they got together and talked, with little or no talk about the lay-off. Their strategy was now implicit. One of the welder's helpers started to do some minor task during one of the bull sessions. His welder shouted at him: "What are you trying to do, work yourself out of a job." The helper laughed and stopped. Later in the day, the spreadman stopped his pickup truck on the top of a small hill and watched the welders. One of them remarked: "We're being 'bird dogged'" (watched). Another one replied: "yep." No move was made to go back to work until the spreadman drove away. Later he came to the group and called for the union steward; they both left in the pickup. They came back a little later, the steward got out, and the spreadman drove away. The steward asked the assembled welders: "You guys

want to settle for travel time from here to home?" They all agreed to settle and work was resumed at the regular pace.

"Pace setting," similar to "rate setting" in factories, is used only infrequently for output restriction. The reason probably is that gangs often reach a point on the line where they can go no further. When this happens, skilled workers and in-group laborers "go in for ten." (i.e., they actually work less than ten hours but are paid for a full ten hour day.)

Welders use pace setting in at least three ways: (1) to maintain a norm of an "honest day's work for an honest dollar," (2) to restrict the number of welders hired, and (3) to reject certain other welders. Of the three uses of pace setting, the first most resembles the rate setting found among factory piece-workers. The proper pace is not explicitly stated except when a manager makes "unreasonable" demands, when a welder has to be told that he is "working himself out of a job," or, as happens infrequently, when a worker has to be told that he is too slow and that he is "making us all look bad."

Pace setting to restrict the number of welders hired seems rarely to be practiced. Workers talk of a few cases in which it has occurred; however, the observer was present several times when the welders were dissatisfied with the number of welders being brought into the gang, but their objections were not carried into action.

The use of pace setting to reject disliked welders is probably more common than its use to restrict the number of workers. The observer was able to watch the following incident: Five new welders were brought into the spread from another one operated by the same company. One of the new welders happened to be a well-known and disliked "wind bag." He was assigned to a group of welders which had been working on the spread since the beginning of the contract. Early in the morning, the old welders got together and decided to "weld out" on the rejectee. This was done in the following way: They began to move from "set-up" to "set-up" by going "round about" instead of "single file." (A "set-up" is the length of pipe a welder works on before he moves his truck; "round about" moving means that each welder completes his set up and then goes all of the way to the head of the line of welders for another set-up; "single file," the common mode of movement, means that none of the welders change position until all of the welders are ready to move up; then each welder follows the welder in front of him.) Each of the welders, in this case, began to work hard and rapidly, and without regard for the progress of each other, but the rejectee kept up with the pace until his truck became bogged down in the sand. It is common practice for a stalled welder to be helped by other welders, but the rejectee was passed by. After the day's work the welders gathered at a filling station where they often refueled. One of them remarked:

"Well, we welded out on old P____." Another one replied, "Yeah but he had to get stuck in the sand; one thing you got to say for the sonofabitch, he's a 'welder.'"

Property owners can slow down the work by threatened litigation or by insisting that the workers and machinery remain strictly on the right of way. Work can proceed much faster sometimes if the contractor has more "elbow room" than is afforded by the legal right of way. The property owner in such cases is dealt with by favors such as dirt moving work or money payments.

Workers, inspectors, and supervisors can cooperate in frustrating attempts of union representatives to carry out union policy. For example a crew had been working in a pump station for two days. The main line had been completed and most of the spread's workers had been brought to the pump station to help with a number of complicated "tie ins." The regular pump station employees were unionized and the owning company had an agreement with the union that non-union members were not to work within the area. During the first two days of work at the station the union steward had been checking the workers for currently valid union cards. Very few of the men had them. On the third day the steward threatened to have the job shut down, but the owning company officials persuaded him to talk it over with the contractor first. The steward then came to the spreadman and asked where he could get in touch with the contractor. Although

the contractor was standing nearby (just a few seconds before, the spreadman and contractor had been talking) the spreadman answered: "Hell I don't know! Last I heard of him, he was in New Mexico." The contractor left soon and didn't return to the job. The union steward mingled with the workers during the few days required to finish the job. As far as the observer was able to tell, the steward never learned that the contractor had been in the area. The job was completed without further conflict.

Most of these "team performances" represent silent conspiracies--implicit agreements to deal with particular situations as a "team."⁶ It was understood, for example, by members of a ditching gang that Indian graves uncovered by the ditching machine on the Navaho reservation were to be disguised as rapidly as possible and not discussed in town. The secrecy about the graves occasionally unearthed by the ditching machine was designed to avoid the legal requirement that these must be reported. When reported, officials, including Interior Department officials could and frequently did stop the jobs until the nature of the graves and their possible legal significance and archeological value were determined.*

*These examples, of course, pose an ethical problem for the observer. It is fairly easy to extend the attitude of cultural relativism to pipeliners when the only thing remaining in the grave is a rectangle of black earth. The observer's tolerance, however, may be strained when he hears that an intact pithouse has been bulldozed into oblivion. The

Many of the performances are explicit conspiracies. For example, a company official often drives in a radio equipped automobile a mile or so in front of a truck that is illegally overloaded. If the official sees a police patrol car he radios a disguised danger signal to another radio equipped car just behind the truck. The second car then signals the truck driver who turns off onto a side road. Most pipeline truck drivers know the safest routes around ports of entry at a dozen state borders.

A railroad crossing job provided an illustration of broad cooperation on the part of an entire crew. On one railroad crossing job, the railroad fill proved to be an especially difficult one to bore through. The fill continued to cave in, and to become dangerous to the railroad. In this case the spreadman assigned a worker to do nothing but watch for railroad officials who might have the job halted. Another time, a county road commissioner delivered an ultimatum to a contractor that a job would be stopped if safety signs were not placed along the road which ran alongside the pipeline right of way. The spreadman could not meet both the safety standards and his contract deadline. Consequently, he and one of the gang foremen drove to town, discovered that the commissioner was alcoholic and that his

quaint theory of an extinct race of people "no mor'n a foot and a half high" which pipeliners have evolved to explain the pits does not make up for the observer's discomfiture.

drinking pattern was of the "binge" type. The commissioner was reported to remain alternately sober for a few weeks and then drunk for one or two weeks. The supervisors also learned from townspeople the commissioner's favorite brand of liquor, visited him to consult him about types of road signs, got him drunk, and finished the job without making any changes in safety signs.

The function of a nationwide recruiting system for the industry is obvious. The short term jobs and the speed needed to recruit a crew cannot be met by any kind of formal recruiting agency. Union locals come closest to furnishing formal recruiting channels, but their participation in the process is minimal. In order to meet the demand for welders the Pipeline Contractor's Association has founded a pipeline welding school in Tulsa, Oklahoma. The school plans to train and recruit but it is too early to evaluate its impact upon the industry.⁷

The payoff for the construction supervisors' participation in the informal networks is more ready access to crews needed during the heavy summer season, crews for unattractive and dangerous jobs, and crews for very short jobs in places remote from concentrations of pipeline jobs. By cashing in a worker's obligations to himself for past favors or by granting and withholding favors the supervisor can extend his power beyond the authority of his official position. The supervisor can also command the loyalty his company needs in

gaining advantage in his dealings with unions, other companies, inspectors, and public officials. It is difficult for the worker to think of "my company," when during a single season he may work for a dozen different companies. The supervisor, however, can muster kinship and friendship loyalties to the company. Loyalty to the supervisor, whether it is based on kinship or friendship, for all practical purposes becomes loyalty to the company.

The supervisor has several kinds of favors to use in labor market trade. He can grant overtime to some workers and withhold it from others. He can make a particular job last longer for some workers than for others. Tractor operators are needed on a job at first in increasing numbers and then in decreasing numbers as the job progresses. The supervisor can use a few operators from "kickoff to tie in." Less favored operators have shorter jobs. The supervisor can trade detailed knowledge of future opportunities and the higher he is in the company hierarchy, the more likely it is that he will have participated in the bidding process. Construction superintendents are almost certain to help determine the bid which will be submitted. Gang foremen are consulted much of the time. These officials, then, have knowledge of future opportunities in proportion to their rank in the company. The supervisor frequently can make opportunities available for training other people's sons and other relatives. He can trade all of these things for

submission to authority, loyalty, and a willingness to tolerate mosquito-ridden swamp jobs and other equally undesirable jobs. The worker, who is willing to "help out," can expect more overtime, longer periods on particular jobs, opportunities for his relatives and knowledge about future jobs.

The inspector's role in the exchange is often important. He can "make it hard or easy" on construction company officials. The inspector has considerable latitude in interpreting the quality of work. Some of the latitude the shipping company gives to him (e.g., his "judgment"), and some he assumes (e.g., his duplicity in cooperation with construction company officials). The inspector usually is an ex-pipeliner who has given up high income in favor of settled residence. He usually knows many of the pipeliners personally, and his sentiments often are those of the pipeliner's despite the fact that his duties lie with the shipping company. He is in a position to receive favors from pipeliners such as having his son trained in a pipeline skill.

There remains the question of how these systems of advantages which rest essentially upon particularistic relations are integrated with the universalist production standards of the industry. The integrative aspects of pipelining are examined in Chapter VIII.

FOOTNOTES

¹William R. Quarler, "Editorial," Pipeline Construction (August, 1965), p. 2.

²Katz, p. 317.

C. W. Mills, The Power Elite (New York: Oxford University Press, 1956).

Joseph Mitchell, "The Mohawks in High Steel" in Edward Wilson, Apologies to the Iroquois (New York: Random House, Inc., 1959), pp. 3-38.

Myers.

Sasaki.

Warner.

³Katz, p. 319.

⁴Editorial, Pipeline Construction (June, 1965), p. 3.

⁵Lewis, Pipeline Industry (April, 1966), p. 57.

⁶Goffman, pp. 77-105.

⁷"National Pipeline Welding School Begins," Pipeline Construction (August, 1965), p. 22.

CHAPTER VII

APPRENTICESHIP: A LONG RANGE CONSEQUENCE OF THE EXCHANGE NETWORKS

This chapter undertakes a description of the social relationships involved in becoming a skilled pipeline construction worker. The industry offers a convenient opportunity to study the informal and direct training of workers.¹ Construction companies do not sponsor formal training programs, yet most of the skilled workers in pipelining probably were trained on the job while working as laborers. Moreover, the skills are fairly complex and in order to learn one of them, the learner must have instruction and he must have access to the equipment and materials with which to practice. The process of skill learning then, has been examined in terms of the trainee's status relationships to: (1) previously trained workers who can give or withhold instruction, (2) supervisors who control access to the materials and equipment for practice, and (3) inspectors who control work quality.

Groups of families (bunches) and cliques often travel together from job to job. In this way, the groups remain fairly cohesive despite the frequent moves which must be

made. This is fortunate for the pipeline apprentice because he is very dependent upon such primary groups throughout most of his training. The group usually contains his main instructor and it keeps him informed about new jobs and jobs in which he may practice his goal skill. In addition, friendship-kinship group members often supplement his salary by furnishing him with food, lodging, and money for other expenses. Even with his advantages, the trainee, like other workers, often is unemployed. Consequently his laborer's salary alone is not always enough to meet his expenses.

The pipeline skill aspirant may learn a trade in one of four generally recognized skill categories. These are, in the descending order of their income and prestige among the workers: welder, heavy equipment operator, pipe processing machine operator, and truck driver. He may acquire the necessary training in trade schools (welders only), in other industries, or by "breaking out on the line" while working as a laborer.

Most skilled workers probably are trained on the line while working as laborers. Trade school welders are not favored and, despite the fact that most of the pipeline skills are found exclusively in other industries, entry of outside trained workers is restricted by pipeliners' unfavorable attitudes toward them. The attitudes probably are reinforced by outside trained workers' initial ignorance of pipeline routines. Outsiders are seen as inferior in skill

and as workers who will not live up to their obligations to contractors and the transmission companies. "Not only is their work bad, but they don't give a damn." An observer can hear a number of statements such as "I never saw a trade school (or shop) welder who was worth a damn." "The only time I've ever worked a trade school welder was when I was in union territory." "They know everything, you can't tell them nothing; send them to the dope gang to weld a piece of equipment, they can't find it; you got to show them. They don't know a dope pot from a granny rag. And besides it's not just knowing how to weld, you got to know the pipeline."

An incident which occurred between two unemployed tractor operators demonstrates some of the attitudes held by in-group pipeliners which help to restrict jobs to those workers trained on the line. The two workers were sitting around talking and drinking whiskey in an apartment house living room. Although getting off the subject occasionally, the conversation remained generally on pipelines and pipeliners. One of the men becoming expansive, stood up and said in a loud voice, "If I don't get a job pretty soon, I ain't gonna' remember how to pull them levers (steering devices on a tractor)--better get a little practice." He then got two chairs, set them side by side in front of another chair, sat in the third chair and began to operate the imaginary tractor. He furnished sound effects and mock exertions. In a little while, another unemployed worker,

affecting what was taken for the walk and speech of a farmer, walked up to the "tractor operator" and asked: "You reckon a feller could get a job on this here pipeliner?"

"Had any experience?" asked the operator.

"Shore have," answered the "farmer." "I reckon I've drove them Farmalls a thousand miles."

"How many levers them Farmalls got?" asked the operator.

"Bout as many as this here Caterpillar," replied the "farmer."

"Well," said the operator, "you can go to work but you'll have to get used to these levers; the first one will be a 'idiot stick' (long-handled spade) and then sort of work up these here on a tractor."

Breaking Out

Upon first examination pipeline skill-learning appears to be loose and unorganized because unskilled workers seem to pick up skill techniques just here and there. Pipeliners themselves tend to see the acquisition of skill as cumulative experience on the pipeline plus some help from skilled workers. This seems essentially to be true but getting a trade is selective rather than random, and it is made to conform to workers' beliefs about what it takes to be a pipeline welder or an operator.

The social relationships involved in pipeline skill-learning may be described as a series of changing status-role relationships between the trainee and the people who help him to break out: skilled workers, supervisors, and inspectors. The process seems to consist of at least three distinct stages. First, and with few exceptions, the trainee must be a kinsman or a friend of some pipeliner who can either train him or to someone who can arrange to have him trained. Next, he goes through a period of training and practice in which he is a laborer officially, but, in which he has special privileges and duties other laborers do not have. During this time he is recognized as a "bronc breaking out," and other workers often are obligated to help him whenever they can. He is among the last of the laborers to be laid off during the progress of the job, and he is hired over other laborers on new jobs. The third, and most critical, stage is that in which he must make a transition from dependency to competitive relationships with bosses and other workers.

The First Stage

There is little need to distinguish a first stage if the trainee is kin to the person who helps him most. If, however, he is not kin to someone who can help him, he must establish a training-strategic friendship with some pipeliner or become a member in a pipeliner clique. Of course,

all such friendships are not made by skill aspirants; nevertheless, it is acceptable on the pipeline to "get next to somebody who can break you out." Because some unskilled workers seem deliberately to establish friendships in order to break out, this may be considered as a first stage in some workers' training.

If the way in which a skill aspirant goes about getting next to someone is conspicuous, he may be seen in one of two ways by in-group workers. He may "grape up" to a skilled worker. This is conspicuous, but not censured. He may "suckup" to a boss, in which case he is a "brown nose." This is censured and the subject is exposed to frequent and colorful innuendoes concerning his relationship to his benefactor. He is able to learn a skill but his progress depends largely upon a single in-group pipeliner.

The opportunities for establishing training-strategic friendships may be found both during and after the work day. Recreation places and restaurants are convenient locations for friendships to be established. Local hands often help the unmarried pipeliners to find dates in towns near the job. A local hand's instrumental value as a go-between may turn into a friendship which may later permit him to learn a skill.

The work day affords opportunities to establish friendships through "horseplay." A worker may get himself typed as a "smart aleck" or a "pretty good old boy" depending upon the way he enters into horseplay. Horseplay on the

line consists of hitting, wrestling, clod throwing, name calling, tightening vises with long "cheater pipes," and urinating on welding rods (dried ureia is invisible on the rods and it produces a strong and startling odor when the welder fires up). Horseplay is permitted on the line if it does not interfere with work. Consequently, much of it is not formally controlled, but the informal control of horseplay approximates something like the "pecking order" found among chickens.² It is often carried on between status unequals, but the low status person does not initiate it. There are long-standing friendly feuds among workers but the time and place for acting these out are chosen by the upper status workers when status discrepancies are broad, as in a feud between a laborer and an operator.

The time and place control of non-technical behavior by upper status workers sometimes extends to conventionalized greetings as in the following example: During a lull in the work, a fairly new laborer walked up to a truck in which a welder and the observer were sitting. He asked the welder: "who is that bird with you, is he worth a damn for anything?" (A common innocuous remark on the line.) The welder neither answered nor looked at the worker: The worker stood with his foot on the truck's running board for a few minutes and then walked away. During the next few days that he worked on the spread, the laborer made several other attempts to enter into the horseplay and banter of the in-group workers. It is

doubtful whether he was rebuffed so completely as he was by the welder, but within a few days he "drug up (quit) for no reason and borrowed money to get home on."

A foreman, commenting on the worker, said: "I've seen that kind before: they get out on the line and want to fool around. Who the hell does he think he is?" The fooling around that the worker tried to do was apparently no more than the horseplay that in-group workers carry on, but he was labeled an "overbearing smart aleck" because "common hands don't act like they owned the pipeline." Out-group workers probably cannot get into a position to learn a trade by remaining passive. But the skill aspirant must often use great discretion in his aggressive attempts to learn.

The extent and manner in which an unskilled worker enters into horseplay is perhaps more of an index to his standing than it is a means to achieve status, but decorous participation may enhance his chances of getting next to a strategic person. For the most part, this means that he must wait for the time and place cues, and be a cheerful target for practical jokes.

There are at least two other types of work situations in which an unskilled worker may become a friend of some pipeliner who can help him break out. Probably the most common is that in which a skilled worker trains his helper. This seems especially to be true of welders. Physical stress situations, such as river crossings, also give some outsiders

an opportunity to become in-group pipeliners. Once started, many crossings must be completed before the workers quit work for the day. Consequently, they often spend many continuous hours on a crossing with only the sleep afforded by thirty or forty minute naps taken in pickup trucks, on tractor and dope pot trucks, and on the damp river sand. There is an apt saying among pipeliners that a river crossing "separates the men from the boys." Many unskilled workers are free to "go to the house" (quit for the day) during a crossing and those who remain on the job for continuous periods of up to 80 hours gain some prestige. At least their names become known to other pipeliners. Workers may even be recognized as in-group pipeliners because "only a pipeliner is that crazy about overtime."

In addition to proving their physical prowess and becoming known by being seen continuously, laborers who work on river and difficult road crossings have the advantage of a less rigid informal status system. Although formal work roles are maintained, normal work routines are changed. Social distance between bosses and workers, and between high and low status workers, is lessened perceptibly. In-group out-group distinctions seem to disappear altogether. Workers become more and more compatible with one another as their fatigue increases. Any joke, no matter how old and often heard, produces laughter. Workers become tolerant of each others' mistakes and clumsiness. The laborer who was unable

to enter into the horseplay during a regular work day probably could have done so easily during a river crossing.

Group morale seems to be higher on crossings than it is in other work situations. This high spirit and cordiality may be caused in part by the overtime pay that workers get on crossings. Or it may be a reaction to the danger of "getting on each other's nerves." In either case, it seems that such physical stress situations offer important opportunities for the induction of out-group workers.

The Second Stage

Once the trainee becomes recognized as a man breaking out (the second stage) he learns by instruction and practice of the skill. If he is learning to weld, he can observe the techniques employed in that skill daily. At slack moments in the day's work he can weld on scrap pipe and perfect his own technique. If he is learning to operate a side boom or dozer, the practice consists of operating the machines where expert work is not too important. During this stage, the trainee may receive instruction and supervised practice from several skilled workers in a single day. Indeed, under certain conditions, any skilled worker is obligated to help the trainee. For example, if an operator has a task to do in which the work need not be expert and there is a trainee present who needs the practice, the skilled operator is more or less obligated to let him do the

work. In many cases, it might seem that being thus "spelled" (relieved by a trainee) gives the skilled operator an opportunity to rest, but often it is an added responsibility ". . . it is easier to do the work yourself than to worry around with some bronc."

This seems true for all trainees except those learning to weld. Welder trainees, although they may not be trained by the kinsman or friend who help them to get in, tend to get their training from a single welder. Whereas operator trainees enjoy fairly free access to equipment, welder trainees are more restricted as to the equipment they may use and the conditions under which they may use it. This, perhaps, is due to the fact that most pipeline welders own their own rigs whereas the tools used by other skilled workers are owned usually by the contracting company.

Occasionally, trainees are restricted to bits of technical information, doled out piecemeal. One welder sent his helper-trainee back to the welding truck several times to get a single piece of equipment. A part of the running conversation between welder and trainee during the incident was approximately as follows:

Welder: "Get me a 'round about."

Trainee: "What's a round about?"

Welder: "It's in the truck get me a round about."

Welder: (After trainee returns with the wrong tool.)

"That ain't no round about."

Trainee: "Well, I don't know what a round about is."

Welder: Walking to the truck to get the tool (a device used to mark pipe for cutting). "Boy, if you gonna' weld on the pipeline, you gonna' hafta learn what a round about is."

Perhaps such instruction helps to account for the fact that it often takes up to four years to master pipeline welding. The foregoing example is not, however, simply the result of pure malice on the part of the welder. Many such deliberate blocks to skill learning seem to be based upon the assumption that "you aughtn't to have to show a bronc everything."

Throughout the second stage of training, the trainee's status is recognized by management largely through supervisors' implicit permission to use time, expendable materials, and equipment in practicing. It is recognized by owning company inspector's through their tolerance of substandard work.

Often the supervisors participate more actively in the bronc's training. For example, if an assignment does not interfere with other work, a skilled worker will sometimes be assigned to a special task admittedly because he is breaking out a bronc. Road crossings furnish an especially convenient setting for welder trainees. Very often a welder on a crossing will be waiting more than working, thus giving his bronc a chance to practice on scrap pipe. In addition

to time, the pipe is placed inside of a protective casing which is made and fitted to the particular road. Since its main function is to keep dirt from scraping the dope from the pipe, the welding does not have to be expert, and the trainee can do much of the actual work.

Management's support is not entirely due to direct kinship or friendship and other ties. Most managers have attained their own position through one, or a series of, on the job apprenticeships. Consequently, the trainee has the advantage of the belief that such training is the only way to become adequately skilled. In addition, after the trainee has worked as a laborer for several weeks, he usually has acquired some knowledge of the routines of pipelining. As a result, he is sometimes assigned to straw boss groups of laborers on special jobs which are not handled directly by any of the standard gangs.

The inspector's interest in the bronc's achievement usually is more remote than is that of the contracting company boss. Inspectors tend to remain in one area. Consequently, they are much less likely to be kin to the trainee than are bosses. Occasionally, an inspector will arrange to have one of his kinsmen trained by a pipeline skilled worker, but the key to the inspector's participation in the apprenticeship system seems not to be in any extra job relationship between himself and the trainee; rather, it comes about as a result of his necessary cooperation with contracting

company managers. Superficially the interests of managers and inspectors are antagonistic. Managers want to make a profit as quickly as possible, whereas inspectors want enough time spent to maintain their companies' standards. But, in order to get the work done, the two groups of workers cooperate in many ways. For example, they must deal often with recalcitrant private property owners and public officials. Much of this cooperation is necessarily covert and informal because some of the negotiations are against transmission company policies, or they are illegal (e.g., frequent bribery). It seems that the inspectors' support of the bronc is an extension of this cooperative tendency. That is, it seems to be a situation in which the inspectors reason: "You help me out, and I'll help take care of your boy."

The Third Stage

The third stage of the trainee's progress seems to be the most critical. He works as a skilled worker whenever he can, but often he must work as a laborer. He may go from company to company trying to find skilled jobs in which more expert workers are unavailable. The trainee and the people who have helped him sometimes judge his competence differently and there is more interpersonal conflict in this stage than in the other two. This is illustrated in the following lament by a foreman who helped the subject of his comments.

I broke that bastard out on a dozer; know what he done? Tried to get me to put him on a dozer on that B_____ job. You know yourself it takes a "operator" for a job like that. He couldn't understand that. Hell no, he's going to take a dozer and go out and conquer the world. Hasn't spoke to me since; to hell with him!

In addition to differing judgments of competence, the trainee may not understand adequately the changed role expectations which apply to him and to people who have helped him. At this stage, he is thrown into the competitive labor pool without the necessary competence, and with his source of help cut off by prohibitions with respect to the "brother-in-law" hiring of skilled workers.

When nepotism extends into a skilled position, as in the following incident, there may be a lack of consensus among workers. The contractor wanted to finish a job before the end of the day. This, and an agreement with the inspectors, caused the spreadman to hire a trainee as a fully paid welder for the part day. The inspectors agreed on condition that the bronc "set up on two." The other welders were "setting up on three." That meant that the bronc would make only two-thirds as many welds as the other welders. The inspectors' reasoning was: "If he sets up on two he may be able to do good work; just make sure you plug up his holes; you pay the salaries."

The welder with whom the observer was working at the time was unhappy at the arrangement, and the fact that he had to reweld some of the trainee's welds during the day

caused him to be more dissatisfied. He admittedly tried to have the trainee fired. He criticized him at every opportunity. Each time inspectors came by the welder made statements such as: "Boy, this is the first time I ever saw a welder get by with pure murder; welding over his puddles is like trying to weld up a screen door." Each time the spread-man came by the welder said something like: "Boy, it must be nice, knocking down a welder's salary without doing anything."

The disgruntled welder's complaints were not entirely personal. Bosses are occasionally reprimanded by superiors for hiring "phoney hands." The welder called repeatedly upon standards of competence which would have applied under slightly different circumstances. After the work day he tried to solicit support for his criticisms. The other welders agreed with him outwardly but one of them told the observer later that he couldn't see anything wrong with the bronc's working and that the critical welder "just hates to see anybody get something he don't get."

Appropriate behavior in this case was not clearly defined. The bronc undeniably lacked the competence ordinarily expected of welders. On the other hand, the inspector was satisfied with his work and the bronc had not "rolled" anybody. That is, he had not taken the job from someone thought to be more deserving. This is only one example of the kind of ambiguity which characterizes the bronc's third stage of

training. He never quite knows when he has lost the privilege of irresponsibility.

The friction which often marks the third stage of training seems due to the uncertainty arising from two sets of hiring standards in pipelining: that of trainees in terms of relationship criteria, and that of other workers in terms of production criteria. The two sets of standards are fairly well segregated throughout the first and second stages, but their distinction tends to become obscured among both workers and managers during the third. This is due perhaps to the lack of any "graduation" ritual or other very clear symbolism which might mark a transition from the status of bronc to that of fully skilled worker.

Broncs who can do skilled work, "but not too good" are sometimes advised to go to other companies and not to work for the one in which they broke out until they "get pretty good." The assumption among workers is that "you learn faster when you get out on your own." Aside from its effect upon learning speed, leaving the primary group probably serves the important function of taking the newly trained worker out of uncertain relationships wherein "old buddies all of a sudden start throwing their weight around." Moreover, it probably relieves some supervisors of the uncertainty of their roles with respect to trainees. As long as the trainee is clearly recognized as a man-breaking-out, the supervisor can treat him in terms of who he is or whose boy

(protege) he is. But, when the trainee begins to compete with skilled workers, supervisors are expected to view him in terms of production criteria. In addition, the supervisor's confusion often is compounded by his own kinship to the trainee during the third stage of training.

It is perhaps during this period of partial competence and interpersonal uncertainty that the pipeliner develops a surprising indifference to being "run off" (i.e., fired). One tractor operator told the observer, "I'll tell you how you break out on a tractor; you climb upon a tractor and get your butt run off (fired) till they don't run you off no more." His experiences were duplicated to some extent by most of the skilled workers interviewed. There seemed to be little or no reluctance to recount the personal experience of being fired. The observer remarked to a welder that such frankness surprised him. The welder replied "you ain't going to find nobody out here with a cherry."* The only worker known by the observer who tried to conceal a similar failure (to pass a welding test) was an object of amusement and pity to other workers. They "felt sorry for him because he let the test failure get to him" not because he failed.

People who aid the bronc must do so carefully. Most pipeline workers probably are hired with some regard to

*The term cherry is a metaphore referring ultimately to an undeflowered maiden.

their extra-job relationships to bosses and other workers. But they usually must meet certain minimum technical requirements. Such hiring ranges all the way from a foreman's offhand judgment of a worker's strength to the impersonal verdict of an x-ray machine. In spite of this dominant mode of hiring, however, the apprenticeship system remains particularistic. Common sense observation has produced the statement that "it's not what you know, but who you know" that often accounts for your getting ahead; but both workers and managers recognize the threat of wholesale nepotism to contracting companies. The belief in this threat may be seen in comments about unsuccessful contractors. For example, "the woods are full of contractors who went broke because of too many phoney personnel," or "too many brother-in-laws." A spreadman told the observer how he "learned his lesson." "I run a old boy off once just so old B_____ could have the job. I don't know why I did it; to this day, I can't look either one of them in the face. A boss who'll do that's got no business pushing men."

Integrative Functions of the System

Rather than being as disruptive as it might seem, the apprenticeship system seems to circumvent a great deal of conflict which might otherwise result from large kinship groups working in a highly competitive industry. By absorbing much of the kinship-friendship hiring, it probably keeps

incompetent workers from doing much inadequate or damaging work and it keeps them from competing "unfairly" with skilled workers. Moreover, the trainee trains when there is "not much else to do and it won't hurt." His training can be set aside at any time for "more serious business." His special privileges are given to him at such a low level that the efficiency of the spread probably is not diminished.

The apprenticeship system frees bosses from having to decide whether or not to hire workers on a kinship-friendship basis or to hire more skilled workers. In many cases, bosses may hire workers on the basis of both sets of standards if kinsmen or friends can be placed in skill learning situations. The boss is expected only "to use his head." This means that he must be able to distinguish those situations in which trainees may be dealt with in terms of relationship criteria and those in which they must be dealt with in terms of production criteria.

FOOTNOTES

¹This conception of recruiting is taken largely from Theodore Caplow, The Sociology of Work (Minneapolis: The University of Minnesota Press, 1954), pp. 102-106.

²C. Murchison, "The Experimental Measurement of a Social Hierarchy in Gallus Domesticus," Journal of General Psychology, XII (1935), pp. 3-39.

CHAPTER VIII

AUTHORITY JUDGMENT AND TECHNICAL COMPETENCE

Competition and Worker Evaluation

Efficient production in modern American industries is dependent upon some minimum maintenance of relatively impersonal standards of quality and efficiency. Quality and efficiency ordinarily are supported by universalistic criteria for evaluating the efforts of workers. And both workers and managers are committed largely to universalistic and specific production norms. That is, the norms have become institutionalized. The same individuals are committed also to the particularistic norms which regulate interaction among kinsmen and in primary groups. Workers are thus potentially committed to conflicting legitimate demands made upon them unless the occasions for performing in the roles are segregated.

The model relation between impersonality and efficiency, if carried to its logical extreme, would require a labor market consisting of individuals whose relation to one another and to organizations would be one of pure competition based upon competence. There are, however, several reasons for believing that factors other than pure competition within work forces operate in all organizations. Race, sex, and

ethnicity, of course, modify the objective evaluations of job applicants. The social and personal strains of pure competition often are officially recognized, and procedures such as seniority systems are instituted to reduce them. The ubiquitous phenomenon of output restriction by workers, and the frequent failure of piecework incentive plans to stimulate production indicate reduced competition among workers. Output restriction, especially, is bound to have a leveling effect on personal ability and motivation. Informal agreements to hold production to certain levels restrain the best workers from doing their best, and cause the less capable worker's efforts to be indistinguishable from that of the better. Thus output restriction obscures both exceptional ability and mediocrity. And finally, competition itself is a threat to the objective selection and reward of workers. Although the principal value commitments of workers and officials may be to universalism, their personal efforts are often designed to gain advantage despite objective rules of the game.

Despite evidence that universalistic norms operate imperfectly it would be difficult to argue that modern American industries could survive in the face of unencumbered nepotism or other forms of particularistic hiring. Herein lies the integration problem. How, precisely, are potentially conflicting role commitments mediated within the concrete

organization in such a way that they do not destroy the organization or undermine morale?

Supervisor's Role Set

Favoritism can be largely a matter of subterfuge, or it can be open. Where subterfuge is involved, the main problem for the conspirators is that of "not getting caught." When favoritism is open, the principals have the problem of achieving the explicit or implicit consent of other people who may be affected by the transaction. In pipeline construction, the preferential treatment of kinsmen and friends is mostly open, and it is generally approved by others. Open and approved favoritism is, of course, a more complicated arrangement than is subterfuge. It must be investigated in terms, not only of the relationships themselves, but in terms of the technical requirements of the industry, and in terms of all of the individuals who might be affected by the transaction. In pipeline construction, the behavior of people in authority with respect to preferential treatment of workers is especially important. A supervisor, who hires a worker in response to a particularistic obligation, must generally receive the consent of his supervisors and the shipping company's inspectors. The consent usually is implicit, but it is no less real. Although a supervisor may be allowed a few instances of "bad judgment," too many instances will threaten his own job and reputation.

In addition to the authority of supervisors and inspectors, the supervisor who uses his position to pay off particularistic obligations must take into account other workers who might have been hired, and workers who must work with the "bronc" and undo his mistakes. The present chapter, then, explores what can be called the aid giver's achievement of "role set consent."

The particularistic basis for hiring on the pipeline seems not to interfere seriously with production standards, nor do they pose a threat to workers who expect to have their technical competence rewarded with preferential employment, above all they seem not to pose personal dilemmas for bosses. Recruiting and apprenticeship, the most visible patterns of network based employment, seem to be organized in such a way that they channel particularistic hiring into areas in which it interferes neither with production standards nor with morale.

Particularism and Work Quality Standards

Despite the particularistic basis for hiring on the pipeline, there are three sources of support for universalistic production standards--the quality requirements of shipping companies, the efficiency requirements of contracting companies, and the standards of "fair play" imposed by workers themselves. The shipping company has its interest represented on the operating spread in two ways. Quality

standards are maintained by a corps of inspectors who are present on the spread from the time the project is started to the time it is completed. Increasingly, this corps of inspectors is being supplemented by subcontractors who perform one of several inspection tasks. The most common type of subcontracted inspection is that of pipe weld x-rays. The principal inspection standby, however, continues to be the inspector, with ruler, long-handled mirror (to look at the weld underneath the pipe), and, as some pipeliners would have it, a "beady eye," and a "suspicious nature." The inspector's official job is to see that the pipeline is completed according to contract specifications and that it is installed in such a way that the pipe will not rust, the welds will not break, and the pipe is not dangerously close to other pipelines and power cables. Inspectors, along with construction supervisors, are responsible for the maintenance of state and federal safety standards in the pipeline installation.

The inspectors, despite their duties, become involved in many of the exchange systems which characterize the pipeline labor force. Most of the inspectors come from the ranks of pipeliners. Becoming an inspector is one way to hold a steady job with lower pay and to avoid some of the rigors of active work on the pipelines. Many inspectors return to work on the pipelines. Their sentiments very often are with pipeliners rather than with the larger and more

impersonal corporations whom they are hired to represent. The inspector's obligations, based on personal relationships to other pipeliners, however, are limited by his own value commitments to duty. Moreover, the number of agreements he can become involved in is limited by the increasing presence in the industry of precision inspection techniques and devices. While an inspector might be willing to "take it easy" on a particular contractor out of sympathy, the x-ray machine "tells no lies." The "jeep," an electronic device, gives very precise information on the quality of the bitumin coating which is applied to the pipe before it is buried. Precision inspection includes such techniques as a "cold water test" in which a length of pipeline may be filled with cold water and allowed to heat during a normal day's period. The resulting expansion places far more pressure on the line than the nine to fifteen hundred pounds of pressure which gases and fluids will exert later on. A faulty arc weld or a weak seam will break under these conditions before the line is buried. More and more frequently welders have their work tested by increasingly accurate and revealing techniques. This includes sawing through sample welds, chemical tests, x-ray examination, and various other equally searching techniques. Such inspection technology has the effect of making universalistic standards harder to disregard. Even when inspector-supervisor relations are friendly the duties of inspectors usually are in some conflict with the duties of

supervisors. The main job supervisors have is to get the work done as rapidly and as cheaply as possible. Speed and thrift, however, are among the major sources of inadequate work. The inspector acts as a brake on both thrift and speed. The contractor, then, needs some balance of speed and efficiency.

The inspector's involvement in the pipeliner networks is the principal modifier of his strict adherence to universalistic quality standards. The standards are modifiable to a certain extent because the inspector is allowed some latitude for interpretation in the performance of his duties, and he assumes some use of judgment on his own. He often is willing to violate the letter of company regulations while maintaining the essential standards. For example, if he thinks the shipping company has been too stringent regarding the acuteness of an angle in a curved section of pipeline, he can allow the contractor some leeway on his own account.

The same profit motive which requires speed and efficiency also requires a ready labor force who can take orders and be loyal. This is where past favors and future promises pay off. But too many errors which have to be corrected, too much waste, or too much ineptitude can be costly. "When you get a contract, you got to get in and get out; if you don't you lose your butt." The needs for both efficiency and a ready labor force are in potential conflict but they

are mediated by several factors on the pipeline. A "bronc" welder can be allowed to weld road-crossing casing because it does not require the degree of skill which pipe welding requires. The bronc can be allowed to cut and bevel pipe joints for the same reason. Bronc dozer operators can do much of the rough backfill work. Bronc sideboom operators can haul equipment and handle pipe "when nobody's working under the pipe." In every skill on the pipeline, there is a fairly broad range of degrees of skill which are actually needed. Much of the ineptitude created by particularistic hiring is drained off by selective task assignment which matches the relatively inept worker's skill with the requirements of the task.

An important source of pressure on gang foremen in the largest company in which observations were made is a "bid footage--completed footage ratio." The contracting company, which is a large one, makes bids on construction jobs based on estimated footage per day. Gang foremen are accountable at the end of each day for any discrepancies between bidded footage and actual constructed footage. The ratio seems to be a very important source of strain in this particular company. Much of the contracting is over-bid to give gangs some leeway but it may not be over-bid to the point where a boulder just under the surface of the earth on a right of way may not stop a gang for several hours. Stopping a single gang on the pipeline is a more or less serious setback

depending upon which gang is involved. The gangs which work near the front of the line are more important in this respect because a "dead gang" in front can stall all of the gangs behind it. If something happens with the right of way gang, especially if the work is organized so that the stringing and pipe gangs come right behind the right of way gang, then the right of way gang can hold up production for several hours. Sometimes when an obstruction is too complicated the rest of the spread can go around it and later tie in that part of the line. However, if the pipe gang cannot do its work several dozen workers may be stopped. Moreover, these stoppages involve the idle cost of equipment. Supervisors' attempts to avoid stoppages generally receive worker cooperation.

One frequently used surveillance technique is called "birddogging." Birddogging consists of making frequent, more or less silent, but visible checks upon the work of either a person or an entire gang. Birddogging may be used in situations in which there is doubt about the worker's ability or willingness to work, and in conflict situations. Birddogging is generally seen to be a surveillance technique to speed up workers but it sometimes is used for harassment. "I just don't want them sonsofbitches to think they're getting by with anything."

Much cooperative subterfuge seems to be used in such a way that workers are able to meet production schedules

which they would not be able to meet if universalistic norms completely governed their relationships to the company. Illegal actions, for example, require close cooperation among workers, supervisors, and inspectors. Such actions have the tacit approval of officials of both the contracting and shipping companies despite the fact that they are illegal and "strictly against company policy."¹

The workers themselves are not so completely self-centered, or committed to kinship or friendship that they cannot see the boss's "point of view." Pipeliners, like workers in other industries, maintain a conception of a fair day's work for a fair wage.² No relative or friend expects unlimited privileges. There are, however, "misunderstandings" regarding duties and privilege. These breaches occur especially during the pipeline skill trainee's third stage of apprenticeship when his relationships to supervisors and other workers are not clear.

Whether or not a particularistic personnel selection will be approved by other workers depends partly upon how they view it as possibly affecting themselves. Each such action is evaluated by other workers on the spread. The observer once had occasion to work alternately in two spreads. (One was making a river crossing while the other was completing the line on either side of the river.) This furnished opportunity to hear offhand comments about the two spread superintendents. One of these (a part owner of the company)

was described as a man who hired "brother-in-laws" (kinsmen generally) and he was condemned on that count. The observer noted that the condemned spreadman had working for him only two relatives, whereas the "best spread-boss you'll ever work under" had no less than five. The speaker was not among them. Later conversations disclosed the belief that the part owner "had just as soon roll you as not" (replace you with a kinsman), whereas, the favored boss apparently gave acceptable recognition to impersonal criteria. Sanctions against nepotism in the form of verbalized sentiments are brought to bear depending upon how friends and kinsmen are hired--not whether or not they are hired.

Since expectations based both upon relationship and production criteria impinge upon the spreadman and foreman one might expect rather chronic expressions of role conflict. But little evidence of this could be found. Rather, there are four ways out of the dilemma. (1) The boss may place his relative in a skilled job if the worker is conspicuously competent. (2) He can place him in a job for which almost anybody is competent (common labor). (3) He can use his extensive contacts in other companies to help his friend or kinsman. (4) He can have some other skilled worker to train his kinsman or friend. The pipeline apprenticeship system as a way out of potential dilemmas deserves special note. It furnishes most of the skilled workers for the industry and it combines all of the alternatives for bosses discussed above.

A supervisor cannot afford to get a reputation as an unfair boss, either with respect to treatment of workers or in the way he hires crews. Occasionally the boss who suspects that he does not have role set consent when he hires relatives directly, may be especially severe with a kinsman to show that "he ain't no better'n nobody else out here." The observer recalls one bronc (tractor) who had his tractor assigned to someone else in the middle of a job. He thought that his own work had been adequate. Consequently, he complained to other workers. Later in the day, however, he said, more to himself than to anyone else, "hell, I know why he done it; he didn't want nobody to think he's playing favorites."

FOOTNOTES

¹Bensman and Gerver show how technical standards are circumvented with the implicit approval of highly placed officials:

Joseph Bensman and Israel Gerver, "Crime and Punishment in the Factory" in Bernard Rosenberg, Israel Gerver, William Howton (eds.), Mass Society in Crises (New York: The Macmillan Co., 1964), pp. 141-151.

²Miller and Form, pp. 280-81.

CHAPTER IX

SUMMARY

This thesis has attempted to describe patterns of kinship and friendship which function (1) to adapt the pipeline labor force to the structural characteristics of the pipeline construction industry, and (2) to demonstrate that the same patterns generally integrate the particularistic obligations of kinship and friendship with the universalistic demands of the industry. Groups of kinsmen, cliques, and pairs of individuals who exchange job related favors, act as recruiting "agencies" for construction companies. The particularistic obligations of kinship and friendship are discharged in such a way that they ordinarily do not interfere with the workers' business of getting the work done to the satisfaction of shipping and contracting companies.

Pipelines and Pipelining

Pipelines are used to transport products ranging from fruit juice to automobile parts, but the lines are used mainly for the transport of petroleum products. The major growth of the pipeline construction industry, from 1900 to the present, has paralleled and depended upon the growth of the petroleum industry. During the early years of the first

major growth of the petroleum industry, the pipelines were built by the companies that owned them. As pipeline construction became more and more technically specialized, the companies found that organizing occasional units to build pipelines was cumbersome and expensive. In the 1920's Humble Oil Company of Texas, and later most other companies, organized semi-independent pipeline construction companies. These were financed by the parent companies, but they had their own boards of directors and accepted contracts from shipping companies other than their owner. Most of the semi-independent companies still exist, but the shipping industry found that an even more satisfactory solution to the occasional need for construction was to encourage the formation of completely independent construction companies and to deal with them on a contract basis. Thus, the major result of rapidly increasing technical specialization and increasing cost of construction equipment was the emergence of independent construction companies. Some of these have grown into major corporations, but many of them have remained small.¹

In the 1960's construction companies owned by one or a few individuals do most of the construction work. The ambitious pipeliner, who has or who can borrow a few thousand dollars, and who can rent enough machinery to complete a job, can become a pipeline contractor. Perhaps most of these individuals are unsuccessful. Many gang supervisors and

spread superintendents are former contractors who have become bankrupt or have "sold out." Some who had invested little equipment and money may have just stopped being contractors. Nevertheless, enough of these small entrepreneurs are successful for periods long enough to give the construction industry one of its main characteristics.

Technology, Time, and Distance

Two major features of the pipeline construction industry influence the behavior of its labor force: (1) continually increased specialization, and (2) the time and distance peculiarities of the industry. Only a few years ago, numerous pipeliners could do several of the tasks required on the pipelines. Even today there are a few "old heads," usually spreadmen, or superintendents, who can operate dozers and sidebooms, weld, or coat the pipe. Most of the construction tasks, however, have become sufficiently complicated so that very few of these universally trained pipeliners now work in the industry. The present trend is toward greater complexity of tasks and greater specialization. The consequences for the labor force has been (1) to restrict workers to particular skills and (2) to shorten the amount of time necessary for any worker to complete his particular task on any contracted job. Welders, on a job lasting four weeks, will be needed for only two weeks; most of the tractor operators will be needed for no more than three weeks. Only about two-third of the workers can outlast the

need for the gangs in which they started, and only unskilled laborers can expect to work in more than three gangs. Some very specialized workers such as pipe cleaning machine operators and "stabbers" have completed their work when their respective gangs ("dope" and "pipe"), are finished.

Pipeline construction jobs are often short and far apart. Even a cross country line of several hundred miles is usually divided into several spreads which can do the job within a few weeks. Often segments of longer lines are contracted to separate construction companies. More typically, the entire project will be contracted to one company which then subcontracts parts of the job to several smaller companies. The net effect of the shortness of jobs is to present both small and large contracting companies with the recurring task of recruiting crews for a few days or a few weeks work. The same time and distance factors present workers with the recurring task of finding several different jobs throughout the construction season.

Bunches, Cliques, and Networks

Three emergent structures other than the contracting firm have been identified: Ad hoc groups of kinsmen which form around kin ties, friendship cliques, and networks of two person exchange partners. None of the resulting groups of kinsmen can be described as extended families. More often they consist of a variety of combinations of kinsmen.

The formation and persistence of the kin groups depend as much upon the time and place characteristics of the industry as upon recognized kinship. Although these ad hoc groups, which pipeliners call "bunches," consist mainly of individuals who are kin to one another, they usually contain some group members who are unrelated by kinship to the others. Friendship obligations which arise in cliques account for much of the job finding and crew formation activities of the pipeline labor force. Here friendship is defined as one of mutual attraction in which interpersonal obligations of friendship, like those of kinship, extend beyond the context of work into recreation, housing, and money lending. (3)

Neither the bunches nor cliques, however, accounts for all of the contact networks which help to move the pipeline labor force. Kinship, although prominent on the pipeline, seems not to be extensive enough to furnish most of the workers for the industry. Friendship, based on mutual attraction, is not durable enough to furnish a dependable labor force over an extended period of time. Indeed one of the consistent observations made during the investigation was that the contact networks seemed to operate effectively regardless of the interpersonal feelings of the participant. The networks function effectively although the participants frankly dislike each other. Even kinship networks often involve frank mutual dislike among the participants; yet they continue to function as job finding and crew recruiting

channels. The justification for the term "friendship" to describe mutual exploitation is that the non-kin networks, no matter what their present interpersonal tone, often originate in mutual attraction, or "trade offs" based upon attraction. A "trade off" is the discharging of an obligation to an exchange creditor indirectly by helping his relative or friend. Thus, the persistence of a particular network is not so much due to the original reasons for coming into being, but to its pecuniary functions. The obligations of network members to one another are ultimately translatable into money.

The networks, then, seem to originate in ad hoc social groups of kinsmen, and in cliques of friends which, at first, involve activities and obligations which extend beyond the business of job finding and crew formation. Some of these groups are stabilized and made permanent by their functional relationship to the pipeline construction industry. Even if the groups do not become permanent, the pecuniary relationship established among members becomes sufficiently important to the workers to insure frequent future communication despite both interpersonal antipathies and intra-kindred schisms. Consequently, breaches of friendship and kinship roles, such as occasional officiousness, are not as completely disruptive as they might be if the relationships lacked persistent economic significance to the pipeliners.

The overall effort reported in the thesis has been to formulate hypotheses regarding the character, origin and dynamics of the networks, and their functional relationships to the industry, to the construction companies, and to the workers. The term "occupational contact networks," borrowed from Katz, has been used here to refer to communications systems among workers who are informally organized, and who sustain more or less persistent relations among themselves.² The networks are the channels through which workers find the kinds and number of jobs they want and through which contracting companies fill out their work crews. Workers who participate in the networks are most often white men who are characterized by southwestern, and rural, backgrounds. The networks seem to originate in particularistic, diffuse, and emotionally involved kin ties and friendships. The operation of the networks do not, however, depend upon continued diffuse and emotionally involved relations, but they do continue to be particularistic.

The principle dynamic feature of the networks is a system of (usually implicit) exchange arrangements among individuals. Each individual involved in the networks has something which he can exchange for something he wants. The nonsupervisory worker can exchange his availability during the heavy season, his loyalty to supervisors, and his willingness to take occasional unattractive jobs. In return he assures himself some preferential treatment from construction

supervisors. From supervisors who are indebted to him for past favors, the worker expects employment during periods in which jobs are hard to find, some overtime, the longest possible employment on any given job, and the longest possible season. The supervisors, within certain limits, are able to dispense favors to workers in exchange for the latters' availability when workers are hard to find, their loyalty, and their extra-official support for his authority. The supervisor controls several things which are negotiable, the most important of which are his knowledge of future job openings and his ability to hire because of his authority. Any two exchange reciprocals are indebted generally, rather than precisely, to each other for favors, past and promised. Favors are repaid at the discretion of the debtor; only occasionally are they demanded by the creditor. The repayment of favors need not be immediate or direct. A foreman may hire a friend or a relative of his own creditor as a form of payment. In fact the indirect payment of such obligations often become even more complicated. A single favor may affect several individuals.

The "bunches" of kinsmen and the cliques are genuine social groups. They can be described in terms of the most inclusive criteria of groups.³ They are characterized by "continuity." Although their formation is an ad hoc arrangement, the members remain together most of the time. The members are mutually aware of each other and think of

themselves as group members, and outsiders identify them as bunches. The groups are characterized by an interpersonal structure which is dependent upon, but distinguishable from, their occupations. The bunch, for example, is usually identified by its leader's name. The groups have formed regular communication routes, hence this observer's emphasis upon contact networks. They are characterized by group norms which are particularistic and diffuse. And, finally, the groups develop group goals--"Where are we going after this job?"

Several characteristics of the industry both facilitate and restrain the formation and continued existence of bunches and cliques. Many, perhaps most, of the informal relationships related to job finding, skill learning, and crew formation cannot be described in terms of long persisting identifiable groups. Many workers participate in networks in what can be described only as "pair relationships." Two people recognize each other as exchange partners. Each of the two are also involved in other dyadic relationships. Consequently any worker may, at any given time, be obligated by past favors to other workers and supervisors, while at the same time he may expect favors from as many exchange partners. The interwoven sets of relationships constitute systems which cannot be described in terms of bunch or clique membership. The potential for conflict between these network relations, and their role in effectively moving the

labor force is, however, the same as those within the groups.

There seems, then, to be a dual tendency within the labor force for the interpersonal exchanges, which originate in kin ties or friendships, to become circumscribed either with respect to the number of exchange partners with whom a worker maintains contact or with respect to the extent of obligations involved in the relationships. If the worker's principal interpersonal relations remain either within a bunch or a clique, the range of the personalistic responses the group member is expected to make to others is fairly complicated. Not only is his relations to other group members particularistic, they are affectively charged and diffuse. These personalistic responses are manageable because they are limited largely to the members of the group. If, however, the pipeliner's continued and advantageous employment depends upon a great many individuals, the sheer weight of personalistic responses to others tends to force the dissolution of certain of his primary group ties to other workers.

One theoretical alternative to primary group relationships which workers experience as cumbersome and inconvenient is for primary group relations to dissolve entirely and to be replaced by universalistic, specific, and nonaffective relations among former group members. Changes in intragroup relationships, however, seem not to go this far among pipeliners. Interpersonal relationships within the bunches and cliques continue to be characterized by particularism,

diffuse obligations, and emotional involvement of members. In the fragmented alternative, interpersonal relations continue to be particularistic within the context of work, but they do not continue to be affectively charged, or diffuse.

We need not seek to understand the bifurcation of interpersonal relations among pipeliners in terms of individual differences or of processes unique to specific groups. Rather, whether or not a primary group with more than two individuals will continue to exist in the industry seems most understandable on the basis of the individual members' relationships to the organization of the operating spread. The lower the skill level of a worker, the more likely he is to be a member of a bunch. The lower the skill proficiency required by a particular gang, the more likely is the gang to be manned almost entirely by a bunch or a clique. A simple skill, because it can be mastered by a greater number of people, means that the person is more likely to be able to work on a job with his bunch. "Right of way," "cleanup," and "dope" gangs, for example, are manned by a variety of unskilled, semiskilled, and skilled workers just as are other gangs. But these workers need not be as proficient as the workers with the same skills in other gangs. "All you really need in dope is a good dope man (foreman)--the operators just have to road the tractor" (follow the contour of the ditch). Tractor operators on the "pipe gang," however, need to be highly skilled. They are, in fact, often viewed

as the prima donnas among operators.* Welders have less skill leeway than do truck drivers. Laborers and semiskilled workers are easily included in bunches which work on the same spreads, and even on the same gangs. Dope, cleanup, and right of way gangs frequently are manned by a single group of kinsmen and their friends.

The difference in the extent to which some skills and some gangs can incorporate workers who range broadly in proficiency is due, of course, to the fact that the pressures for universalistic standards need not be as great. In these skills and gangs there is either a good deal of performance leeway or the results of mistakes are easily corrected. The pressures for universalistic selective criteria are not great because the technical requirements are not great. In skills and gangs in which technical requirements are greater, a foreman's aid is more likely to be indirect. That is, he helps the aid recipient, not by giving him a job, but by giving him valuable information about jobs or by having someone else place him. Thus it is the laborer, the apprentice, the semiskilled worker, or the member of a dope, clean up, or right of way gang who is likely to travel and to identify himself with a bunch.

*Pipeliners use the term "hotshots" rather than "prima donna." They would reject the analogy and the language of ballet as being too effeminate. But to this observer, the coordinated precision of the operators of the pipe gang makes "pipe" the most esthetic of all the gangs. And the similarities between the rhythmic movements of the pipe gang and those of a ballet company are striking.

The worker's number of primary group relationships is not likely to be unwieldy if he can travel with a group. However, if he is not so propitiously located in the industry he encounters a dilemma. He must maintain a sufficient number of particularistic contacts to remain employed, but if these relationships are confined to primary groups in which each relationship is special and diffuse, the sheer weight of personalistic knowledge which he must have becomes a major burden for him. The pipeliner, so situated, seems to resolve his dilemma by reducing his involvement in his relationships to a point where only particularism is left. A relationship which originates in friendship is affective, diffuse, and particularistic. Bunch and clique members "have fun" together, hold each other to a wide range of obligations, and hire, or otherwise help each other as a requirement of the relationship. Changes in the worker's relationship to a group seem to approach the following patterns: The affective component of the relationship is, for a variety of reasons, the first to dissolve, after which the range of obligations (diffuseness) disappears from the relationship. The particularism among former members remains because the worker is dependent upon the relationship for a successful season, and companies and their supervisors are dependent upon particularistic recruiting for their very survival as organizations. It is particularism, not universalism which moves the labor force. In short, the exchange "negotiables"

which at first include such things as gratitude, pleasure, and the admiration of subordinates finally become restricted to the exchange of work related favors. The process of bunch and clique dissolution probably differ from one another only in the degree to which diffuse expectations disappear. Workers who recognize kinship with one another continue to be somewhat generally obligated "to help out if you can."

Kinship-Friendship Relations and Conflict

Theoretically, the technological requirements of the pipeline construction industry and the particularism of network hiring should conflict with each other more than they seem to do. And, indeed, despite the functions of the primary groups and networks in distributing the labor force, potential for conflict between the two sets of standards exists and sometimes surfaces. But despite potential conflict and its occasional expression, the particularistic obligations seem to be discharged most of the time without (1) seriously interfering with the technical requirements of the industry, (2) without creating for supervisors the objective or subjective experience of role conflict, or (3) without undermining worker motivation to learn skills.

Particularistic placements are not made indiscriminately. They represent a form of controlled particularism. Aid recipients are placed in positions, or series of

positions, for which they do have the necessary minimum skills. The simplest examples of controlled particularism are to be found in day to day placements on the job. The most elaborate example is the apprenticeship system, in which the person is assigned a sequence of increasingly demanding responsibilities, all of which he is able to meet.

Controlled particularism is possible partly because the pipeline spread furnishes a range of aid possibilities, both direct and indirect. A foreman usually can place a friend or relative in a position for which he is trained, or he can have one of his exchange partners place the man. Indirect aid probably is more frequently given than is direct aid.

Much of the same variety of organizational and technical characteristics of the operating spread which fosters the survival of bunches and cliques create several aid alternatives. The variation in the degree of skill proficiency needed for tasks among the separate skills offers opportunities to place the less apt skilled workers. Welding, for example, offers little leeway for variations in skill. Tractor operation offers somewhat more leeway because tractors are used in all of the gangs and in many different ways. A "bronc operator" can be assigned to a tractor in the dope gang because he can afford to make more mistakes than can the tractor operators with the pipe gang. Level and unencumbered terrain requires less tractor operator

skill in any gang than does forested, mountainous, or swampy terrain. The mid-season of the industry almost always requires more workers at all skill levels than are available. During mid-season the mediocre welder, operator, or other "bronc" often is the best man available, and whether or not he gets the job through pull has little relevance.

Particularistic aid usually is backed by subcultural legitimation, and the aid giver usually can expect to receive role set consent for his actions. The supervisor can grant particularistic preference by "using his head." The experienced and successful supervisor usually can recognize occasions for giving direct aid, indirect aid, or no aid at all. He not only "knows the job," but he is intimately familiar with the abilities of many workers. Special privileges given to a friend, kinsman, or a friend of a friend is approved by other workers and supervisors by statements such as "everybody had to learn sometime." Each of the other workers has learned his own skill through identical arrangements. And the individuals making up the aider-boss's role set very often are indebted to him for past favors.

While a great deal of favoritism is tolerated by employers, inspectors and other workers, the frequent application of stringent universalistic criteria in hiring and firing are tolerated by potential aid recipients. No worker expects unlimited advantage. The supervisor who gives particularistic aid must learn to distinguish between situations

in which he can or cannot give particularistic aid if he is to remain in the industry. The aid recipient, likewise, is pressed to learn to distinguish among such situations.

The networks are an integral part of the pipeline construction industry. They distribute and redistribute the labor force where it is needed throughout the season. Some contractors might argue that the networks do not distribute the labor force efficiently because "you either got too many or not enough hands." However the "too many-too few" problem is due to the combination of a numerically stable labor force and the curvilinear character of the seasonal need for workers (the labor supply-demand cycle). The supervisor's successful involvement in networks furnishes him with available and dependable workers. He can muster the worker's kinship and friendship loyalties to himself for services to the construction company. Moreover the networks underpin the supervisor's official authority because they extend his ability to reward and punish well beyond any particular job. The networks furnish workers with a few exchange partners in, to paraphrase Malinowski, the far off dangerous regions ("up north where the people are unfriendly").⁴ The worker can, if his contacts are sufficient, insure that he will get the longest jobs by traveling the shortest distance from one to the other, be able to work a maximum of overtime, and enjoy a long season.

Latent Functions of the Networks

The special significance of kinship in the pipeline construction industry is indicated by the prominence of people who are kin to one another on almost any job. The major function which the networks seem to serve for kinship is the stimulation and maintenance of kin relations which extend beyond the nuclear family. The networks insure some economic as well as other significance for the members of bunches.

The industry, being dependent upon the networks, gives to kinship a personal relevance which it does not ordinarily have for Americans. The important entity here, however, is not the extended family which, according to some recent investigations, have survived the encroachments of industrialism.⁵ The pipeline bunch is not a family governed by the traditional roles of family members. It is a group of kinsmen which includes brothers, cousins, brothers-in-law, cousins-in-law, or any combination of these. Some bunches are characterized by three generations of working male members, but this is quite accidental. Generation has nothing to do with the division of labor within the group, or with its relation to the pipeline industry.

The geographic mobility required by modern American industry is thought generally to have a fragmenting influence upon kinship.⁶ However, when mobility is so intense, as it is within the pipeline labor force, there is likely to be a

great deal of face to face contact by relatives. The increased contact can then act to enhance the relevance for members of fairly large kin groups which have been formed on an ad hoc basis.

There is little doubt that the labor union movement has had profound but indirect influence upon pipeline work. The frequently heard "we pay union scale or better" attests to union influence. Many of the pipeliners recognize such labor union benefits although they may be anti-union in sentiment. One of the reasons for the limited success of unions in controlling the labor force has been the fact that the networks seem to furnish alternatives to many union services. The more cumbersome recruiting machinery of the unions cannot distribute the labor force as rapidly as its dispersion and reformation demand. The networks are freer to offer overtime, preferential employment, and ethnic exclusion, and to influence wages and working conditions. Ethnic exclusion is of concern to the southern pipeliners, and they often see greater union influence as a prelude to Negro and Mexican-American entry into the skilled trades of the industry. Above all, the workers fear union interference with their pursuit of overtime.

Workers rarely get as much out of the industry as they want during a season; contracting companies rarely get as much skilled help as they want during mid-season. Nevertheless the labor force and the industry seem to achieve an

optimum adjustment year after year. The companies get enough workers to stay in business; the workers get enough work to remain in the occupation. And despite the potential for mutual disruption, the particularistically organized labor force and the companies have managed to achieve a workable equilibrium.

Networks in Other Industries

The existence of communications networks similar to those in the pipeline industry have been reported in a range of industries wide enough to encompass university professors and fruit pickers, top executives in industry and automobile assembly line workers. Such networks seem to operate at all skill and authority levels, and they operate on an informal base of particularistic obligation. This is not to say that considerations of technical competence are ever disregarded. Rather, the particularism often simply determines whether or not a person is allowed to compete on a technical basis.⁷

While the existence of recruiting networks has been reported frequently, the problem of the integration of particularism with the technical requirements of positions has received considerably less attention. More attention has been given to the malintegrative problems caused by conflicting action alternatives which are inherent in situations in which particularism and technological requirements are not clearly segregated.

There is, however, both theoretical and empirical reasons to study integration. Goode has argued, on a theoretical basis, that the inept are protected everywhere, and at all levels. He argues further that modern industrial societies are not necessarily more efficient because organizations hire the most able, but because they use the inept more efficiently.⁸

A scattering of empirical studies have demonstrated functional relations between the preferential hiring resulting from networks and the objectives of organizations. McGee discovered that "faculty inbreeding" results in departmental continuity as well as career disadvantages for inbred faculty members.⁹ Myers pointed out that building tradesmen, recruited on an informal basis, created congenial crews who worked more efficiently than would crews formed purely on the basis of objective judgments of skill proficiency.¹⁰ Only one study known to the writer has attempted to discern the processes whereby technical standards are maintained in an occupation in which hiring and firing are not confined to considerations of official objectives. Mitchel, in his study of the Mohawks who work in high steel, described an apprenticeship system which could be described as controlled particularism. Beginning early in summer, a seasoned construction crew trains one new steel worker. When the first novice has been trained he is replaced by another. The process continues until, by the end of the

summer, an entire new crew has been trained. This "one at a time" procedure assures each apprentice exclusive attention from an entire crew of experts when he needs it most. Such attention no doubt also reduces the number of costly and dangerous mistakes the apprentice makes.¹¹

Closer investigation of numerous industries should disclose (1) the extensive presence of particularistic networks, (2) that their relationship to efficient organization is more functional than disfunctional, and (3) that the operation of the networks are patterned so that particularistic recruiting does not seriously interfere with the technical requirements of the jobs. We should expect to find the above conditions in industries or occupations which: (1) require a migratory labor force, (2) are characterized by conspicuous ethnic homogeneity, (3) contain many workers who are related to one another through kinship, (4) industries for which most of the skilled workers are informally trained on the job, (5) industries which are seasonal, (6) industries which require low skill levels, and (7) industries in which there is high geographic mobility.

All of the industry characteristics listed above make difficult the formal and impersonal evaluation of talent and skill. It would seem that informal and more personalistic considerations fill niches created by certain industry characteristics. However, the question of whether the organizations often simply "live with" some inefficiency and

tension needs further investigation. The writer's hunch is that conflict mediating structures exist in industries much more extensively than the one sided preoccupation with role conflict would suggest.

A Note on Procedure

In keeping with the limitations of the participant observation method the conclusions offered in the thesis are necessarily tentative. More systematic research on the relationship of particularistic recruiting to the pipeline industry would require (1) a more precise delineation of the industry's labor force and (2) a sample of workers selected to represent various skills and positions in the supervisory hierarchy. Such a sample would be necessary because of the possible different industry experiences of these. It would be desirable to attempt to discover the characteristics of interskill and interpositional pressures toward certain kinds of interpersonal relationships. That is, perhaps the following question could be answered: What precise relevance do particular positions have for the incumbent's participation in networks? Hence, more confident statements could be made regarding supervisory access to valuable information regarding future opportunities and positional restraints upon nepotism and other forms of particularism.

Work histories of the sample of workers, rather than informant reports, could be examined for their support of

hypotheses regarding kinship, and network involvement of workers. These histories should focus upon the role of particularism in job placements, skill learning, and supervisory promotion, and upon more systematic examination for the following hypotheses: The worker is more likely to be a member of identifiable groups ("bunches" or cliques) (1) nearer the beginning of his pipeline career than later, (2) during the first two stages of his apprenticeship than later, and (3) during his first entry into a supervisory position. First entry in the industry, beginning skill training, and first entry into supervisory positions all seem to require the worker's greater dependency upon the personalistic support of others. The longer the worker remains in the industry, the more likely are his job related relationships to others to be characterized by network relations which have fewer primary group characteristics than before. That is, his friendships are likely to continue to be particularistic, but not diffuse and affectively charged.

It is easier, however, to discuss a more systematic research design than it is to pursue it seriously. Selecting a sample of pipeliners in itself would perhaps be difficult. Actually finding the members in order to interview them might prove to be impossible, and if possible enormously expensive. Pipeliners do not remain still long enough to be counted and probed. It may be that controlled research

procedures for some aspects of organization is less practical than are ethnological procedures in which the observer has prolonged and intimate contact with the organizations.

FOOTNOTES

¹Larson, p. 54.
Loos, pp. 215-51.

²Katz, p. 317.

³Olmsted, pp. 13-14.

⁴Malinowski, Argonauts . . ., p. 92.

⁵Litwack, American Sociological Review, 25, No. 1,
pp. 385-94.

Litwack, American Sociological Review, 25, No. 1,
pp. 9-12.

Reiss, pp. 204-10.

The view of kinship groups discussed by Sussman and Burchinal is similar to the view adopted in this thesis. Their formulation centers around "kin family networks," rather than "extended families."

Sussman and Burchinal, pp. 124-33.

Sussman, pp. 333-40.

⁶Parsons, American Anthropologist, 45, p. 34.

⁷Katz, p. 320.

⁸Goode, American Sociological Review, 32, No. 1, 5-
19.

⁹McGee, pp. 483-88.

¹⁰Myers, pp. 126-36.

¹¹Mitchell, pp. 3-38.

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GLOSSARY OF PIPELINER TERMS

The following terms are those used in this thesis. They do not exhaust the pipeliner's lexicon. Some of the terms are universal in the industry. "Spread," "drag up," "wobble" and many other terms seem to mean the same things to any pipeliner. Other terms, perhaps, have only local meanings. Nevertheless, the terms included here could serve as a guide to the world of pipelining for the outsider and as a source of amusement for the pipeliners.

Backfill gang. A small gang which is responsible for covering the pipeline after it has been placed in the ditch.

Bell hole. An inverted bell shaped hole in the ground in which a good deal of repair work is done.

Beveling machine. A machine equipped with acetylene cutting torch; used to prepare the ends of pipe joints for welding.

Big inch. The term has two meanings: (1) Large diameter pipe; (2) A long lasting job.

Bird dog. Conspicuous watchfulness, practiced by supervisors and inspectors to let workers know that they are being watched.

Break out. To enter pipelining, to learn a skill, or to become a supervisor.

Bronc. Anyone who is inept. Used to refer to infants, skill trainee, and incompetent workers.

Brother-in-law. Term used to refer to any male relative hired or promoted because of kinship to a supervisor.

Buckling. Damage to pipe because of rapid temperature changes.

Bullplug. A plug placed in the end of a pipe to keep out foreign material.

"Canada pipeliners." United States citizens who work on Canadian pipelines.

Cap. The final weld beaded on a pipe weld.

Cat. An older term for pipeliner. The term is not used to refer to a Caterpillar tractor.

Cheater pipe. An extension for a tool; used to gain leverage.

Cleaning machine. A machine used to prepare pipe for coating.

Cleanup gang. A small gang which restores the right of way after the pipeline job is completed.

Collar pounder. A worker who pounded the threaded ring used to screw pipe joints together. The skill has been made obsolete by welding.

Dead gang. A gang which, because of some special problem, cannot continue to work.

Ditching gang. Gang which cuts, drills, and blasts ditch to receive the pipe.

Dope. A term applied to any pipe coating other than plastic. Pipeliners distinguish "hot dope," with a coal tar base, from "cold dope" which has an asphalt base.

Dope gang. The gang which applies the protection coating to the pipe.

Dope machine. A machine which applies bitumen or other protective substances to pipe.

Dope pot. A large mobile pot used to melt and keep "dope" heated.

Dozer. A crawler tractor equipped with an earth moving blade.

Filler. Weld beads placed on top of the "hot pass" and under the "cap."

Gang foreman. Supervisor of one of the construction gangs.

Gate valve. A valve which controls the flow of gasses and liquids.

Granny rag. A paper strip used to coat segments of pipe which are inaccessible to the dope machine.

Grape up. To be ingratiating to someone with authority.

Grease wagon. Usually an older pickup truck used to carry fuel, lubrication, and other materials to the gangs.

Hot pass. The second welder bead connecting tow joints of pipe.

Idiot stick. A long handled spade.

Jungle lunch. Lunch bought by the contracting company for an entire crew. Jungle lunches consist of groceries which need little preparation.

Kickoff. The beginning of a job.

Little inch. "Little inch" has two meanings: (1) Small diameter pipe. (2) A short term job.

Lowering in gang. The gang which places the connected joints of pipe into the ditch.

Materials hustler. Man whose responsibility is to keep the gangs supplied with fuel, lubrication, spare parts, and supplies; usually a favored relative, friend, or favor creditor.

Old head. An old timer; a worker who has been a pipeliner for many years.

Pace setting. An informally determined rate of production.

Phoney personnel. Incompetent workers.

Pig. A plug which is blown through a section of pipeline to remove rust, dirt, and small animals.

Pimp. A welder's helper.

Pipe gang. The gang which makes the initial connection of joints of pipe with each other.

Point man. The chief tong man who sets the rhythm of a gang which screwed joints of pipe together. The skill no longer exists.

Pot fireman. A semiskilled worker who operates the dope pot.

Prime Contract. The principal (first) construction contract awarded by a pipeline owning company.

Right of way gang. Gang who prepares the right of way for other gangs.

Roll. To roll someone is to replace him with another worker.

Run off. To fire a worker.

Set up. The number of pipe connections which a welder can weld without moving his truck.

Sideboom. A crawler tractor with a winch and boom fixed to its side.

Single hand welder. A welder who does not own his own rig.

Spread. The organization of enough men and equipment to build a pipeline. The spread includes all of the gangs.

Spread man. The general superintendent who supervises the entire construction project.

Stabber. A skilled worker who aligns the two joints of pipe to be welded with an initial stringer bead.

Stalk. A very rusty joint of pipe.

Straw boss. A worker who is assigned to supervise a small gang of laborers on special problem jobs which are not handled by any of the standard gangs.

Stringer bead. The first bead used to weld two joints of pipe together.

Stringing gang. Gang which places the joints of pipe at the locations where they will be welded together.

Subcontract. A contract, usually for some specialized task, awarded by a construction company which holds a prime contract.

Suck up. To be ingratiating to a boss in a way which is seen as objectionable by other workers.

Spell. To relieve a worker so that he can rest for a short period of time.

Swamper. A helper to a skilled worker.

Tie in. Connections to wells, pump stations, refineries, and other processing plants, and to residential consumer networks.

Tong man. A skilled worker who operated the tongs used to screw pipe together. Tong men have been replaced by welders.

Waiting time. Wages paid to nonworking pipeliners in order to hold them for future work.

Welder gang. Consists of three classes of welders:

- (1) "stringer bead" welders who work with the pipe gang,
- (2) "hot pass" welders who weld a second bead around pipe

connections, and (3) "firing line" welders who complete the welds. Firing line welders are usually referred to as the "welder gang." Other welders are members of other gangs.

Wobble. A wildcat strike.

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