OKLAHOMA ROUGHNECKS: THE CASE FOR AN OCCUPATIONAL COMMUNITY

Marilyn Affleck and Robert M Eakes, The University of Oklahoma

THEORETICAL MODEL

Are the men who work in an industry bound to one another in a way which separates and distinguishes them from the rest of society? Do they constitute an occupational community? An occupational community is composed of members of an occupation who do not separate their work from their non-work lives — "... their non-work lives are permeated by their work-based relationships, interests and values: ..." 1) they see themselves in terms of their occupational roles; 2) they use the community itself as a reference group; 3) they associate with other members in preference to outsiders (Salaman 1971 53,55).

A positive self-image is supported by a strongly salient reference group. Preferential association is encouraged when people share values and attitudes, and think of themselves as having similarities.

Occupational community is determined by two or more of three variables. The most important is involvement in work and task skills. People who are *involved* in their work view it expressively, as something they enjoy doing, as opposed to those who view their work instrumentally as deprivation of time and effort for the sake of extrinsic rewards. Other variables include 1) *marginal status* of the members of the occupation and 2) factors which *confine association* within the occupation. We focus on *invovlement in work* and *confinement of association within the occupation.*

BACKGROUND

Involvement in work is favored when the members of an occupation are able to control the technical environment and the pace of their work. An example is the draftsman who can make decisions about which tools and techniques to use. A variety of tasks, rather than an endless repetition of the same task contributes to feelings of accomplishment and mastery of the work and the work environment (Blauner 1960). Control over the technical environment is especially important as a source of involvement when these are particularly challenging. It is also very important when the work is dangerous. Coal miners have a strong 'personal sense of being pitted against their environment. In facing and overcoming danger inherent in mining, they come to feel that they have cheated death and achieved life through their work, and that they and their fellows have conquered an imposing and deadly adversary (Blauner 1960).

Freedom from hierarchical supervision is also a source of satisfaction and involvement, through the sense of dignity and responsibility which is denied workers subject to close supervision. The factor of responsibility to the general public welfare can be a source of involvement. Involvement in work seems to be especially related to the control which the individual worker can exercise over the work process and the intrinsic variety of the work, and the satisfying sense of accomplishment which the work entails. For roughnecks of the oil industry, involvement in the work is expected as a result of the variety of work tasks intrinsic to drilling which creates an opportunity for workers to see their work as a totality, to see it as dangerous, and to be free from hierarchical controls.

Abnormal working time is cited as significant for 1) the kinds of leisure activities in which workers can engage, and 2) the degree of expressiveness in informal work groups. Leisure time of people who work during evening hours is filled with highly individualized activities in off-duty time, such as reading, working around the house, and individual hobbies (Blakelock 1960). Those who work during the standard work day are more subject to the less flexible pull of mass culture. Night printers are better integrated into the printers' occupational community than day printers (Lipset et al. 1956). Railroaders' social relations are dominated by an intense time sense, and plans for non-work time are contingent on events occurring in the work place (Cottrell 1939).

People who perform dangerous work generally tend to form strong expressive groups and cultural practices which enable them to minimize the danger. Gypsum miners in their work motivations, association patterns, beliefs and outlook are more solidary and less likely to share management's outlook and values than surface workers (Gouldner 1954). In the high steel iron-working trade, the practice of "binging" and verbal harrassment of newcomers fills three functions; 1) It tests a newcomer's trustworthiness and self control under adverse conditions. 2) It establishes temporary status when competence is unclear. 3) It communicates group expectations and standards. The apprentice knows that he has passed the initiation and is accepted as an equal when he is successfully able to join in the banter by "binging" back at his fellow workers.

A final factor which restricts or facilitates association among work mates and is important for occupational communities is the *technological organization of the work*. The degree to which on-the-job interaction is encouraged by the requirements for teams, or inhibited by individualized activity, has implications which extend beyond the job. The location and nature of the work may also have implications for residence patterns of the workers. Because of the ongoing need for their services, hard-rock coal miners tend to form permanent communities near the mine site. These communities are often isolated by distance from the mainstram of the economic and social life of the society. They thus become occupational communities.

Involvement in work is related to the control the worker exercises over the work process, the intrinsic variety of the work, and the degree to which the work entails a sense of completion. For roughnecks involvement in the work is expected as a result of the variety of work tasks intrinsic to drilling, creating the opportunity for workers to see their work as a totality, the lack of hierarchical controls, and danger. Patterns of association among roughnecks is expected to be restricted by three factors: 1) danger; 2) times during which they are required to work; 3) the variability and itinerancy of their jobs.

PETROLEUM DRILLING: STRUCTURE

The oil industry is dominated by a few big producing companies and by smaller "independents." These companies produce oil from proven fields, transport it, and refine it, but rarely do they drill the wells to reach it. This job is left to the numerous relatively small contracting companies which collectively make up the drilling industry. In 1963 95 percent of all drilling in the United States was performed by independent drilling contractors, among which 55 percent of all drilling rigs were owned by contractors having only one or two rigs.

The drilling contractor is essentially independent of the company which pays him. He agrees not only to pay the wages for the crews who work for him, but assumes liability for accidents and agrees in general to be responsible for the crews' performance. He also agrees to assume all predictable costs of the drilling operation, including pipe, rotary drill bits, equipment, tools, and fuel. The financial risk entailed in the search for new production is assumed by the producer.

The contractor is paid by the foot of hole for drilling the well. From this sum he must meet expenses and derive profit. Due to his formula income and limited capital, the driling contractor must complete his jobs in the shortest possible time. For this he requires competent crews and drillers. The drilling crew consists of a driller, derrickman, lead-tong man, backup man, and often a fifth man who serves as a general helper. The drilling operation for the roughnecks consists of adding new joints of pipe to the drill stem, called "making connections" and in removing all the drill pipe from the hole periodically to change drill bits. This work involves various interdependent tasks which must be performed simultaneously. To an experienced crew this work is second nature. The movements are smooth and unhurried. Each person knows from long practice what each of his fellows will do, and when Learning these actions in sequence requires several weeks. Feeling comfortable with just one job requries several months. Mastering them all takes several years.

The driller's prestige rests on his ability to keep the rig "drilling straight." This involves trouble shooting of various types, and getting the maximum use from the equipment and tools, especially the drill bit. If he leaves the bit in the hole too long, heat and friction will cause it to disintegrate, and precious time and money will be lost while special equipment is brought in to recover the pieces. On the other hand, bringing out a "green" bit, one which is still servicable, will cost the company money by returning the rented bit too soon. It is the mark of a good driller to bring out the bit just before it is ready to wear out. If the bit is brought out too soon, it is painted green, and often the driller's name is written on it. To aid him in judging when to bring out the bit, the driller has several sophisticated instruments, such as the geolograph machine, which automatically logs the bit time and depth. But the driller must learn to rely in the "feel of the rig" to determine whether the bit is almost used up, and whether he needs more or fewer collars. This is the kind of judgment gained through long experience such as that which the skilled machinist uses by listening to the "chatter" of his machine to decide when to reset or change tools.

The derrickman is next in importance in the drilling crew. His occupational designation derives from his duty to stand on a small platform high above the derrick floor, to rack the multi-jointed "stands" of drill pipe into the derrick during "trips." The importance of this job rests not in the manual skill required, but in the care and responsibility the derrickman must show regarding the men below. A mistake by the derrickman could result in injury or death to any of the other crew members. The crewmen must have faith in the reliability of the derrickman.

Another aspect of the derrickman's job is the care of the mud system. To remove the tailings (rock fragments) from the bottom of the hole drilling fluid, called "mud" must be circulated constantly from the surface through the drill stem to the bit, and back to the surface carrying the tailings with it. Another function of the mud is to cool the bit. The derrickman maintains and services the equipment which keeps the mud circulating, mixes the mud, and maintains its viscosity according to the instructions of the company and the mud engineer. For this the derrickman must be part plumber, part pump mechanic, and part hydraulic engineer. He functions as an assistant to the pump mechanic, and to the mud engineer who decide on major repairs and the kind of mud to use at particular depths for particular rock strata.

The rest of the crew are floor hands. They are the crewmen who make up the pipe and handle the "slips" which keep it in position. The job of the two tong hands is to work the massive wrench-like power tongs used to connect and disconnect sections of drill pipe. The backup man uses his tongs to keep the pipe from turning latterally while the lead tongs do the work. The backup man also must be able to throw the "spinning chain" when making up the pipe sections. This job requires skill, dexterity and confidence, for the chain is dangerous. The chainthrower is aware that if he is not careful he may lose a hand or injure a workmate if he lets go of the chain while it is in motion. The floor hands also perform the remaining duties of motorman, fireman, and sample catcher.

The job of motorman, which generally falls to the lead tong hand consistes of taking care of the diesel engines which drive the equipment on the rig. There are usually five or six of these engines, and their proper maintenance requires some skill and experience as a mechanic. Roughnecks are not true mechanics, and if a serious breakdown occurs outside automotive mechanics must sometimes be called out to the drill site. But the motorman is expected to make routine repairs on the engines, and to maintain them in good order under normal circumstances.

The jobs of fireman and sample catcher require no special skill, and are often performed by the same person. He maintains fire safety by maintaining fire extinguishing equipment. Sample catching is the collection of bags of drilling mud and shale brought up from predesignated depths, and labeling them for the geologist, who will use them to test for the "show" of petroleum or gas. It is a responsible, but totally unskilled and sometimes onerous job which usually falls to the newest crewman. This allows older crew members to be rewarded with higher status, and enables the drillers to judge the work of a new hand.

The housekeeping and routine maintenance chores are shared equally by the entire crew, and consist largely of scrubbing down the rig. Those acquainted with the drilling process must be impressed with how clean most drilling rigs are kept, considering the amount of drilling fluid that comes out when the drill pipe is pulled from the hole. Scrubbing is usually considered an unpleasant but necessary task, and experienced roughnecks get it out of the way with great dispatch.

The arrangement of authority on the drilling rig implies protection from bureaucratic rules and controls. Since the drillers and tool pushers are expected to provide their own crews, the crews are considered to fall within their exclusive sphere of authority. Any attempt on the part of a driling contractor to intecede in the relations between a tool pusher and his drillers or between the driller and crew is considered illegitimate, and is likely to be deeply resented. Thus, driller and crews are both somewhat insulated from higher authority. The burden of this protection falls on the tool pusher, who has no such protection.

The power to hire and fire crewmen without mediation or interference from above gives drillers and tool pushers a good deal of formal power, but abuse of this power is mitigated by the need for good crews as a job prerequisite. One tool pusher with a reputation as a tough man to work for came to his rig in a particularly bad mood. For half of the daytime tour he rode his driller and his men, and was satisfied with nothing that they did. He was especially hard on the driller, who had come to dislike him intensely. Finally the driller chained down the brake handle and told the tool pusher "If you don't like the way I do this job you can damn well do it yourself!" He then walked off the rig, and to the tool pusher's dismay, the floorhands and the derrickman went with him. This left the tool pusher standing on the floor the rest of the day doing nothing but running mud through the the hole to keep it from collapsing. When the evening crew arrived and saw no car but that of the tool pusher they turned around without stopping and returned to town. When the morning tour arrived they were accompanied by the drilling superintendent with a new tool pusher seated beside him.

The successful driller must be tactful and diplomatic in dealing with his subordinates. Conflicts and quarrels must be settled without creating permanent animosities. Often, drillers and tool pushers will consult with the men to ascertain their feelings before taking action on an interpersonal matter. Drillers, especially, must be on friendly terms with their men. When we asked a driller if the frustration of the job was ever taken out on the men, he replied, "Hell no! I was always good to my hands. If you're not, they'll quit!"

DANGER

Danger in work contributes to involvement in work and preferential association.

TABLE 1: INDUSTRY RANK BY AVERAGE DAYS LOST PER ACCIDENT, 1958-1968

Rank	Industry	Days lost
1	Coal mining	203
2	Heavy construction	126
3	Petroleum drilling	123
4	Petroleum production	103
5	General manufacturing	57

Average days lost per accident = Accident Severity Rate (ASR) / Accident Frequency Rate (AFR). ASR = work days lost due to accidents per million man hours worked. AFR = accidents per million man hours worked. (US Labor Dept 1970 Handbk of Labor Statistics; Bur of Labor Statistics.)

TABLE 2: COMPARISON OF INJURY CAUSES IN THE UNITED STATES BY PERCENTAGE

Cause of injury	1973 %	1972 %	1962 %
Struck by objects	18.7	20.4	17.8
Caught between objects	23.3	20.3	19.4
Falling objects	5.3	4.4	5.9
Striking against objects	3.3	3.4	3.6
Flying objects	2.3	12.9	13.6
Falls of personnel	20.3	16.3	12.6
Over-exertion	11.1	7.4	6.3
Machinery and tools	6.1	7.5	9.0
Temperature extremes	2.8	3.1	3.2
All others	6.8	4.3	8.6
Total percent	100.0	100.0	100.0
Total injuries	**2,836**	**3,448**	**1,888**

(Internat Assn of Drilling Contractors 1974)

TABLE 3: PARTS OF BODY INJURED IN DRILLING ACCIDENTS

Injured body part	N	%
Eyes	115	4.1
Arms	214	7.6
Hands	204	7.2
Feet	283	10.0
Head	201	7.1
Trunk	713	25.2
Fingers	500	17.7
Legs	343	12.1
Toes	54	1.9
Unclassified	199	7.1

(Internat Assn of Drilling Contractors 1974)

That danger is an aspect of roughnecking is shown by accident frequency and severity rates, compared with other industries, as shown in Table 1, where all industries except general manufacturing are known to be hazardous. Petroleum drilling is the third most hazardous type of work. Tables 2 and 3 show causes of injuries and the body parts injured. The most frequently injured parts are feet, trunk, fingers and legs. The greatest hazards on the drilling rig appear to be being caught between or struck by objects.

Among roughnecks the factor of danger is associated with resistance to changes in work practices. Traditional ways of doing things seem to be preferred even though the proposed changes might benefit the workers. The experts of the International Association of Drilling Contractors Safety Clinic find that their suggestions go unheeded, and they use this to account in part for accident rates in the industry. There may also be a reciprocal influence between the traditional organization of the drilling industry and a tolerance of dangerous practices. The drillers probably feel that they know best how to run the job, and they disdain the advice of outside experts as interferring with their prerogatives. The drilling contractors recognize these prerogatives, and hesitate to enforce safety regulations, because the crews are the responsibility of the drillers.

ABNORMAL WORK TIME

The time required for work for drilling crews is highly atypical. The technical and economic requirements of the industry demand that drilling rigs on location must run around the clock, seven days a week, until the hole is complete — 30-60 days for the typical hole. The mean time is 45 days, although shallow or "fast" holes may take only a week, and very deep holes may consume 18 months or more.

Roughnecks are required to work 7 days a week until the job is finished. A crew on a typical hole may expect to work like this for 45 days, then receive a few days off, assuming that the drilling contractor has another job waiting. For day crews entertainment and family shopping must be done at night after work. As the next day is always a work day, such matters cannot be allowed to interfere with sleep. Outings with the family are out of the question except between drilling jobs.

Besides the 7-day week, 2/3 of the roughnecks also work at night, either on the 4-11 PM tour or the 11 PM-7 AM tour. The tool pusher has a more severe problem, because he is the man in charge of the rig. He is the one primarily responsible to the drilling contractor for getting the job done. He is a salaried worker while those under him are wage workers. His job requires that he be in contact with his rig at all times, and there is no time which he can call his own. In any emergency, whatever the hour, he must be on the rig. When the hole is about to "bottom out," reaching a specified depth, the tool pusher must remain at the rig, living in a trailer or camper on location until the crew on tour comes out of the hole for the final time. This period can last up to a month. The tool pusher's life is dominated by his rig. Family life is secondary, and outside social life is highly restricted.

VARIABILITY

The studies of occupational community in other mining industries have emphasized their concentrated character and the tendency of miners to form permanent communities near the mine site which are often isolated by distance from the mainstram of society and economic life. They thus tend to develop a distinctive occupational culture. But we contend that a work situation opposite to that requiring residential proximity, namely one characterized by variability of employment may also contribute to an occupational community among workers.

In the case of petroleum drilling, the variability of employment and the impermanence of the industry as to work site leads to itinerancy among the workers. The workers must become migrant, and must move with the rigs, and travel where the work takes them. How much and how far the worker travels depends on the duration of each job and the distance between drilling sites. The consequence of itinerancy is lack of roots in any one geographic community, and a necessity to acquire root within the occupation.

To establish the variability of employment as the structural basis for itinerancy, statistical data showing the number of active rigs in Oklahoma was compared with fluctuation in the general employment rate. Table 4 shows the active rigs during the second week of each month for the years 1964-1874, revealing seasonal variation in drilling activity. The peak falls normally in December and January. From February to mid-spring and early summer, activity declines, and then gradually increases.

TABLE 4: VARIABILITY: RIG ACTIVITY IN OKLAHOMA AND U.S., AND OKLAHOMA EMPLOYMENT

Month, second week	Number of Active Rigs, 1964-1974										
	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
January	178	151	156	114	112	140	117	89	120	96	136
February	146	140	141	107	95	108	93	84	106	89	138
March	153	158	151	88	86	103	83	64	90	104	128
April	131	145	143	101	99	108	88	95	76	90	145
May	132	173	134	95	107	100	109	77	73	110	134
June	162	169	138	67	101	114	93	72	70	105	134
July	144	163	123	78	97	133	90	83	86	116	148
August	151	156	141	98	83	116	85	111	84	121	151
September	168	153	113	104	109	115	86	98	98	133	156
October	157	180	143	110	115	129	78	104	103	146	163
November	154	162	136	109	133	135	112	114	97	135	135
December	198	186	141	143	159	150	128	92	103	138	171
Mean	156	161	139	101	109	121	97	90	92	115	145
Standard deviation	18.9	13.8	12.0	19.1	20.0	16.0	15.7	15.3	15.0	19.4	13.2
Variability coefficients, (V):											
V, Oklahoma rigs	.121	.085	.086	.189	.184	.132	.162	.169	.163	.169	.091
V, Oklahoma employment	.021	.026	.025	.021	.029	.025	.018	.021	.033	.025	.018
V, U.S. drill rigs	.049	.064	.035	.090	.094	.086	.106	.118	.074	.115	.067

Sources: Oil and Gas Journal 1964-1974; Oklahoma State Employ. Security Commission.
Coefficient of Variability: V = SD/Mean

Table 4 shows monthly variations, and greater variability appears comparing weekly data. Measured against the peak employment week, active rigs in the periods 1968 and 1969 fluctuated as much as 49 percent. Thus, the variability of work in the drilling industry in Oklahoma was much higher than in general employment in the state.

Variation in Oklahoma is more pronounced than for the nation, although the latter still has a range greater than for general employment. Base figures for the Oklahoma drilling industry are smaller, yielding larger percentages, but if this were the only reason, more proportionality would be expected than the data shows. Perhaps the figures for national drilling activity average out regional variations which occur independently of one another.

For roughnecks variety of tasks, seeing the entire operation from beginning to end, lack of bureaucratic controls and the danger element combine to locate the control within the drill crew which fosters involvment. Associations outside work are restricted. The technology of the drilling industry also requires that roughnecks work closely together in teams. Oil drilling reflects many of the structural features related to involvement in work and preferential association in other occupations.

REFERENCES

Blakelock E 1960 New look at new leisure. *Admin Sci Qtrly* 4 446-467

Blauner R 1964*Alienation and Freedom.* Chicago U Press

_______ 1960 Work satisfaction and industrial trends in modern society. 339-360 W Galenson, S Lipset eds. *Labor and Trade Unionism: An Interdisciplinary Reader.* New York. Wiley

Cottrell W 1939 Of time and the railroader. *Amer Sociol Rev* 4 190-198

Friedman E, R Havighurst 1954 *Meaning of Work and Retirement.* Chicago U Press

Gerstl J 1961 Determinants, occupational community in high status occupations. *Soc Qtrly* 2 37-48

Gouldner A 1954 *Patterns of Industrial Bureaucracy.* New York. Free Press

_______ Norm of reciprocity. *ASR* 25 161-178

Haas J 1972 'Binging:' Educat. cntrl among high steel ironworkers. *Amer Behav Scientist* 16 27-34

Internat Assn of Drilling Contractors 1974 *The Drilling Contractor* 30 No 3

Lipset S, M Trow, J Coleman 1956 *Union Democracy: Internal Politics of the Internat. Typograhical Union.* Glencoe Ill. Free Press

Oklahoma State Employ. Security Comm 1964-1974 County employment and wage data.

Petroleum Publ Co 1964-1974 *Oil & Gas J*

Salaman G 1971a Sociological determinants of occupational community. *Sociol Rev* 19 53-77

_______ 1971b Two occupational communities: Examples of a remarkable Convergence of work and nonwork. *Sociol Rev*19 389-407

_______ 1974 *Community and Occupation.* London. Cambridge U Press.