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Manpower in Operating Classifications on the Railroads

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The two most significant studies made by the Presidential Railroad Commission concern manpower in operating classifications and the wage structure.[1] Irrespective of how one appraises the Commission's recommendations (and there are its supporters and detractors), it is agreed that these two studies provide significant new information to economists, government agencies, and the carriers and brotherhoods. In an industry as old as railroading, regulated in detail by government agencies and with a long history of collective bargaining, it is portentous that such large gaps could have existed in our information regarding the manpower profile and the wage structure of operating employees.

The Commission was in complete accord in its direction of the studies, and the methods used were approved by experts representing the carriers, the brotherhoods, and governmental agencies. Thus, the studies possess both a high degree of technical competence and widespread confidence.

This paper is concerned solely with manpower problems, despite the greater richness and novelty of the wage data and my own professional interest in wage structure issues. The wage structure of operating employees is so distinctive and involves such grotesque inequities[2] that discussion of its problems has relatively little general relevance except as another instance of a "demoralized" incentive

[1] The Commission was established by Executive Order 10891 in accordance with the agreement of October 17, 1960, between the carriers and the five operating brotherhoods. The *Report of the Presidential Railroad Commission* was presented to the President on February 26, 1962. The reports are *Studies Relating to Railroad Operating Employees, Employment Trends and Manpower Characteristics of Railroad Operating Employees*, Report of the Commission, February 1962, Washington, Appendix III, pp. 1–105, and *Pay Structure Study, Railroad Operating Employees*, Report of the Commission, February 1962, Washington, Appendix II.

[2] See *Report of the Railroad Commission*, Chaps. 8, 9.

system. The manpower study appears to have a wider range of applicability not only in transportation but in industry more generally.

Manpower Study

Employment in the railroad industry has been declining over the past forty years, except for the period of World War II. Average annual employment of Class I railroads was 2.0 million in 1920, 1.5 million in 1930, 1.0 million in 1940, and 780,000 in 1960. The 1961 figure was 716,000, and that for 1962 may be expected to be below 700,000. This is a decline of over 60 per cent in forty years.

Operating employment on Class I railroads declined from 366,000 to 261,000 in the postwar years 1948–59. This decline of 29 per cent was at a lesser rate than the 47 per cent decline of total employment on these roads, reflecting the larger decline in nonoperating employment. In the postwar period, the number of railroad employees attached to the industry (Railroad Retirement Board data) declined at a more rapid rate than the number of railroad jobs (Interstate Commerce Commission data) as certain employees, particularly in nonoperating and lower-seniority categories, left the industry.

The Commission started its work with the conviction that a careful manpower profile of the work force was a prerequisite to any policy prescription in an industry with forty years of secularly declining employment, and faced with further market competition, additional labor-saving technological change, a merger movement among carriers, and disputes over work rules that concerned manning schedules. It was not enough to project a continued decline in average employment or attachment to the industry; it was imperative to be informed of the age distribution, length of service, and other characteristics of employees in various occupations and types and grades of service, and also to know the rationale of hiring rates and separation rates. The study of manpower was designed to tabulate and analyze data on these characteristics of the work force in the operating classifications.

The railroad retirement system uniquely provides data on the manpower of the railroad industry. (Data in such detail are not available by occupations for other industries.) The Commission arranged for universe counts of operating employment, new entrants, and retirements; it secured 4 per cent samples of data relating to age, service, death, and withdrawals, and 2 per cent samples of unemployment and sickness beneficiaries. These tabulations were generally made for the years 1948–59. The RRB data on employees attached to the operating

occupations in January of each year contain a great deal more detailed information than the mid-month employment counts derived from the ICC M-300 report forms reflecting the number of jobs.[3] For the year 1959, the RRB data showed a total of 260,952 employees attached to operating classifications as compared with 210,673, the average of the mid-month count from ICC reports.

It would be impractical to summarize here the rich statistical detail this manpower study makes available, but four illustrations will show the relevance of the data to manpower planning and policy making.

1. The median age in 1959 of the major operating occupations was as follows: engineers, 59; firemen (helpers), 42; conductors, 53; brakemen, 41. The age distribution within each occupation adds important information. The percentage distribution figures for engineers (35,525) and firemen (67,000), for instance, were as follows.

Age Distribution	*Engineers*	*Firemen*
Under 20	—	1.0
20–24	.3	6.0
25–29	1.2	9.1
30–34	2.2	12.7
35–39	5.1	14.7
40–44	12.5	15.9
45–49	8.9	12.5
50–54	7.7	8.9
55–59	16.2	8.5
60–64	23.6	6.9
65–69	17.0	2.8
70–74	4.2	.8
75 and over	.9	.1

SOURCE: *Report of the Railroad Commission*, Appendix III, Table 15.

Thus, 22.1 per cent of the engineers, or 7,850, were over 65 years of age; another 23.6 per cent, or 8,384, were between 60 and 64 years. The distribution of firemen shows that 7.0 per cent, or 4,690, were under 25 years of age and another 9.1 per cent, or 6,097, between 25 and 29 years. Such details can be elaborated into distributions by

[3] See Technical Note, "Comparability of Railroad Retirement Board and Interstate Commerce Commission Employment Statistics," *Report of the Railroad Commission*, Appendix III, pp. 10–11.

branch of service, such as road and yard, passenger and freight, and other categories. Age distributions are clearly vital to consideration of manpower policy-making in an industry with a history of sharply declining employment.

2. The length of service of employees by occupation, type, and grade of service as well as by age distribution is another dimension of the work force measured by the manpower study. The percentage distribution of years of service[4] completed at the end of the same year (1959) by the same employees (engineers and firemen) are shown as follows.

Years of Service	*Engineers*	*Firemen*
0–4	2.4	17.8
5–9	2.0	13.8
10–14	7.0	20.6
15–19	19.0	29.0
20–24	12.4	6.2
25–29	7.5	3.5
30–34	12.4	2.6
35–39	12.7	3.2
40 and over	26.7	3.2

SOURCE: *Report of the Railroad Commission,* Appendix III, Table 17.

Thus, 31.6 per cent of all firemen had less than ten years and 17.8 per cent less than five years of service, while 26.7 per cent of all engineers had forty years of service and more.

Tabulations by length of service and age distribution for 1959 show that, of the 11,950 firemen defined as attached to the industry with less than five years of service, 670 (5.6 per cent) were less than 20 years old; 8,300 (69.5 per cent) were in the 20–29 age group. Among the 9,225 with five to nine years of service, 1,800 (19.5 per cent) were in the 20–29 age bracket. However, when one considers the bracket of ten to fourteen years of service, as might be expected, virtually no one was under 30 years of age.[5] Since industrial societies often measure attachment and equities in jobs by length of service and age, the detailed

[4] A year of service is equal to twelve months of cumulated compensated service; a month of service is any calendar month in which compensated service of any amount, creditable under the Railroad Retirement Act, is completed.

[5] *Report of the Railroad Commission*, Appendix III, Table 18.

data presented in this manpower study are essential to private and public policy-making.

3. The study shows that, even though the number of employees in operating classifications had decreased steadily from 366,000 in 1948 to 261,000 in 1959, there were in that year 8,934 new entrants with no previous railroad experience. The firemen classification recruited 2,455, or 27.5 per cent, of the new recruits alone.

4. The study also analyzes closely the annual separation rates for operating employees in recent years in regard to the effects of retirements, deaths, and withdrawals. The tabulations are available by age and occupation. They are essential to any careful projections of the work force and to building various models of adjustment in manpower to projected changes in demand and manning schedules. Thus the number of vacancies available to firemen or trainmen in the next five or ten years will depend upon the projected separation rates—retirements, deaths, and withdrawals—not only in the immediate classifications but even more in the engineer and conductor classifications, which are the next step in the promotion ladder.

This section has been designed to call attention to the rich source of raw materials made available in the manpower study of the Presidential Railroad Commission. Study of them can serve as a pattern for a number of industries, such as maritime, printing, and basic steel, which face continued long-term contraction in employment.[6] The railroad manpower study was greatly facilitated by the specialized data made available through the railroad retirement system, and comparable studies in other segments will require extensive collection of new information. It is imperative that studies be begun in these other sectors at the earliest possible date by cooperative programs of labor, management, and government.

Technological Change and Collective Bargaining

The widespread newspaper publicity campaigns on technological change—or the lack of it—in the railroad industry and the emotional changes surrounding "featherbedding" have materially complicated reasoned public discussion of adjustment to change not only in railroads but in industry generally. While railroad managements were divided to some degree on the advisability of these campaigns, partly because

[6] Ewan Clague and Leon Greenberg, "Employment," in John T. Dunlop, ed., *Automation and Technological Change*, Englewood Cliffs, N.J., 1962, pp. 114–131.

morale of employees and efficiency would be adversely affected, the publicity campaigns reflected managerial judgment that their previous attempts to negotiate in collective bargaining had not been successful and that further attempts could only succeed in the spotlight of an aroused public opinion.

The labor organizations were understandably concerned that this campaign so prejudiced many segments of public opinion that it would be difficult to secure a fair hearing even before informed neutrals, that their subsequent bargaining position had been adversely affected, and that public opinion had been emotionally prejudiced. Nor did the contemporaneous flight-engineer problems help to secure a sympathetic public reaction. The railroad brotherhoods resented the fact that their resources for public countercampaigns were small. Despite some pioneering activities, they tended, by and large, in this hostile environment to stimulate their memberships to resistance rather than to the need for accommodation.

This sort of atmosphere in the newspapers is suitable neither for constructive problem solving at the bargaining table nor even for scholarly discussion. In view of the state of public feeling on these questions relating to the railroads, it is essential to devote a brief section to technological change and collective bargaining more generally, and to identify the special circumstances that have aggravated the railroad situation. This discussion is designed to place railroad problems in a more dispassionate setting. Two general propositions are asserted.

The first is that, on balance, collective bargaining has stimulated rather than retarded the rate of technological change.[7] Collective bargaining has required top managements to pay greater attention to the work place and to the managerial line of communication to and from the first level of supervision. Labor organizations have placed managements under strong pressure to seek greater efficiencies and cost reduction. Agreements in most industries provide, in the event of a dispute, for managements to make technological changes and a variety of adjustments in job asssignments, wage structure, benefits, safety, and other conditions of work, through an orderly grievance procedure without resort to work stoppages. Labor organizations have typically emphasized the need for broad training in a work force. There are notable exceptions to this proposition and some agreements have developed significant rigidities, but they should not be allowed

[7] Sumner H. Slichter, James J. Healy, and Robert E. Livernash, *The Impact of Collective Bargaining on Management*, Washington, 1960, pp. 342–371, 946–961.

to distort the general picture. Indeed, the exceptions call for explanation.

The second proposition is to remind ourselves that resistance to technological change is widespread in the community and not the distinctive attitude of any group. "Turnpike companies profiting from tolls, and owners of stage coaches were among the most active opponents of railroads. They were supported by tavernkeepers along the route of the roads, and by farmers who felt that the introduction of the railroads would deprive them of markets for horses and for hay." [8] The railroads may have been more sophisticated but probably no more charitable toward their latter-day competitors (the Panama Canal, the St. Lawrence Seaway, the pipelines, the trucks, and the airlines). There are certain human qualities which suggest that attitudes and responses depend, at least in part, upon whose ox is being gored. Moreover, Professor George Taylor wisely reminds us, "It is a sign of the times, perhaps, that the short-shrift treatment is so largely confined to those rules which benefit hourly paid workers while work rules prevalent in the professions, including college teaching with its tenure appointments, are more sympathetically viewed." [9] Efficiency needs to be weighed against other values.

In the light of these general propositions, the question arises of the reasons for the failure of the railroad industry to make a more orderly and rapid adjustment to technological changes, particularly with regard to various work rules relating to the use of manpower. Collective bargaining developed early in this industry, and the statesmanship of leaders on both sides was widely acclaimed. While there is a tendency among outsiders to minimize the extent of the change in technology that has in fact taken place in the past decade, and to fail to appreciate the degree of accommodation to it on particular railroads, the problem remains a significant one with many facets. These include the recruitment and development of managements, managerial methods and techniques, availability of capital, and government regulatory policies aside from the collective bargaining arrangements. The quest here is for the more proximate factors.

It has sometimes been said that the craft organization of railroad operating employees primarily accounts for their policies toward work rules and manning schedules. This is a temptingly easy solution and

[8] National Resources Committee, *Technological Trends and National Policy*, Washington, June 1937.

[9] George Taylor, "Collective Bargaining," in John T. Dunlop, ed., *Automation and Technological Change*, New York, 1962, p. 94.

congenial to economists since it relies on the inelasticity of demand for a single craft. While the form of organization and the bargaining arrangements do play a role, as will be indicated, the craft explanation is not very significant or perceptive. Thus, the same diesel engine which so drastically altered the work operations of the fireman (helper) also virtually eliminated the boilermaker from the railroad shops. This change eliminated almost 50,000 jobs in the postwar period and caused some difficult adjustments in the structure of the Boilermakers' Union, at least in railroads. But this sweeping change was accomplished without serious dispute or public notice. A number of contrasts between the situation involving the fireman and the boilermaker are most instructive.

The boilermakers had a craft which was transferable to other industries, but the skills of operating employees have little use outside their industry. The boilermakers often were able to command as high or even higher compensation in construction, shipbuilding, and boiler-manufacturing enterprises. It is hard to discover jobs in industry which would provide annual incomes to match those of operating railroad personnel with skills of little transfer value. The Boilermakers' Union is engaged in a number of industries and could directly facilitate the transfer of displaced workers through knowledge of job opportunities, hiring arrangements, and personal contacts. The railroad operating unions have few collective bargaining relationships outside the railroad industry. The disappearance of the jobs of boilermakers on the railroads did not involve the threat of disappearance of the union as an organization. The railroad operating unions, however, are tied almost exclusively to railroads. While the work operations and the jurisdiction of boilermakers were defined in scope rules, there was no collective bargaining provision or state law establishing a manning rule for boilermakers or providing for the employment of so many boilermakers in each shop. In contrast, the national diesel agreement of 1937 requires the use of firemen, and various state laws prescribe the size of the train crew. Finally, the boilermakers were not confronted by a rival union in their jurisdiction, nor did they share a promotion ladder with another craft, as in the case of the firemen and engineers.[10] It is the combination of these various factors which is responsible for the differences in adjustment of two crafts to the same technological change.

[10] George R. Horton and H. Ellsworth Steele, "Unity of the American Railroad Engineers and Firemen," *Industrial and Labor Relations Review*, October 1956, pp. 48–69.

In general terms, the degree of difficulty in adjusting manpower to technological change can be related to five factors. Their identification will assist in locating the sectors of the economy which may involve most problems in adjustment to change.

1. A sector with long-term decline in employment magnifies the problems of adjustment.

2. A high degree of turnover, as is typically the case in occupations characterized by women employees, or in industries with casual employment, tends to mitigate the severity of adjustment problems. The long-term attachment of men in railroads complicates the task of adjustment.

3. Occupations with specialized skill, as among railroad operating employees, compared to skills with wide transfer value, involve greater problems, particularly when wages are relatively high compared to other wages in the communities in which many operating railroad workers live. Employees are often required to make changes in both location and occupation to secure alternative employment.

4. The concentration of a union in a single craft in a single industry makes adjustment more difficult in the face of adverse technological change, since the question of institutional survival of the labor organization complicates adjustments. Merger among labor organizations in the railroad industry, as in others, has proven most difficult. The problems are magnified by the fact that ladders of promotion, such as fireman and engineer, are served by rival unions, and work rules and seniority arrangements defining work opportunities between the crafts on the same ladder impede merger. Further, the future of the labor organization, its officers, and its bargaining rights are at stake in addition to jobs. Labor organizations confront budgets also, and when employment and dues have fallen below a certain level the organization may cease to be financially viable.

5. The inclusion of explicit manning rules in collective bargaining agreements or in state statutes or regulations further complicates adjustments since such rules become symbolic and often provide a barrier to review of new technological possibilities. Moreover, a single national rule is likely to prove more difficult than a variety of locally bargained rules which permit local experimentation with new processes and a variety of compromises. There has been little opportunity for local or regional experimentation on firemen questions, although there has been much more variation in the case of rules on crew composition.

Policies to Facilitate Manpower Adjustments

The lesson of history is clearly that work rules cannot for long frustrate technological change. The labor movement early learned that a policy of obstruction[11] could not succeed. In the language of President Perkins of the Cigar Workers: "No power on earth can stop the at least gradual introduction and use of improved machinery and progressive methods of production." Matthew Woll stated in 1929 the position of the labor movement: "It is not the function of the labor movement to resist the machine. It is the function of the labor movement to turn the installation of machinery to the good of the workers."

The central problem of collective bargaining raised by technological change is, accordingly, accommodation to the change. These problems are most acute in the types of situations identified by the list of five factors noted in the last section. Irrespective of the wider effects of a particular change on the economy as a whole, technology does destroy or erode job opportunities and skills for particular groups; this destruction is analogous to the destruction of capital values and rents. In an advanced industrial society the task is to design procedures to secure orderly adaptation to continuous change rather than to fight through an isolated technological change.

Economists tend to think of the flow and direction of manpower solely in terms of the concept of the labor market. While concern with the labor market is appropriate, it involves only a portion of the relevant flows of manpower in the economy. A more complete analysis of labor flows requires equal attention to the flows of manpower within enterprises or other units established by collective bargaining, and also the relations between such internal flows and the exterior markets.

It is appropriate, perhaps, to emphasize the importance of this concept to economists. The flow of manpower within a unit, and to and from the exterior market, is largely regulated by a series of rules of the work place affecting ladders of promotion, seniority districts, overtime allocation, work allocation, manning rules, retirement, and the like, as well as by the internal wage rate structure. Thus, the rules governing the definition of seniority districts and the criteria for layoffs will determine whether employees are discharged from the enterprise

[11] Sumner H. Slichter, *Union Policies and Industrial Management*, Washington, 1941, pp. 201–227.

and returned to the exterior labor market or whether they remain partially employed or attached to the enterprise. Moreover, these rules determine which particular employees are affected. Still other rules will determine the rights to promotion, the division of overtime or other work opportunities, and other flows of manpower within the enterprise or other units. Further, narrow seniority districts may result in hiring new workers from the exterior market while other workers are on layoff status in other seniority districts. Any attention to the efficient allocation of the labor force must involve both the traditional exterior labor market and the rules directing the internal flows of manpower and their interchange with the exterior market.

The significant question of policy concerns the measures that can be taken to increase the effective use of manpower already attached to the industry and to provide an orderly adjustment of manpower to technological and market changes in prospect. The following measures may be suggested to apply to manpower in operating classifications in the railroads.

1. There is need to broaden seniority districts and even to create new carrier-wide or even industry-wide pools or lists so that employees, particularly of long service, are given rights to employment elsewhere on a railroad or even elsewhere in an industry on other carriers before new people are hired. In an industry with declining employment totals, it is less than a rational use of manpower to continue to attract and to train new employees to very specialized jobs while other workers, often older with these same skills, are being released permanently. One of the significant features of the Kaiser-Steelworkers plan provides for a plantwide labor pool below the separate departmental seniority districts. The Commission proposed such a national roster for firemen separated or furloughed as a result of its recommendations. But wider seniority districts are generally required, particularly with regard to permanent layoffs.

2. An industry with declining employment totals should gradually adopt a program of compulsory retirement at age 65. This policy is the more appropriate in an industry with adequate or even generous pension or retirement benefits as compared to industry generally. In an industry with 22.1 per cent of the engineers and 15.8 per cent of the conductors over 65, revised retirement policies should play a role in the necessary adjustment of manpower to further technological change. It may well be that the gradual adoption of a compulsory retirement program, starting at age 70 and working down to 65, should be associated with some increase in retirement benefits to encourage even

earlier retirement in some cases. These suggestions are opposed by senior men who have spent a long time looking forward to the opportunity of choosing certain select runs which provide considerable overtime or short hours of work. But a retirement program has nonetheless a major contribution to make in the adjustment of manpower to changes taking place in the railroad industry.

3. Changes in the hours of work of certain operating employees, particularly in local freight service, also have a contribution to make to more orderly manpower adjustments. Among local freight engineers, 75.5 per cent worked forty hours or more a week, 60 per cent fifty hours or more, 34 per cent sixty hours or more, and 15.1 per cent 70 hours or more. In contrast, 53.9 per cent of through-freight engineers worked less than thirty hours a week, another 24.7 per cent between thirty and forty hours, a further 14 per cent between forty and fifty hours, and only 7.4 per cent over fifty hours a week.[12] While these hours are related to the wage system and other rules, it is clear that one way to adjust to employment declines is to provide in local freight service for lower weekly hours of work for some employees with the longest hours, even at the expense of weekly earnings.

4. An industry which has highly specialized jobs and a long-term record of declining employment has an obligation to encourage the retraining of its labor force. Programs should be made available particularly to employees in the age brackets below 30 years, who have least seniority, are more vulnerable to unemployment, and are also most likely to move voluntarily. There may well be a case for sharing costs between the industry and the community, but it is imperative to a manpower policy to encourage such training while workers have jobs rather than to defer training until they are unemployed.

5. The proposal has been made by a number of labor organizations and adopted in some agreements that the orderly adjustment of manpower to further technological changes in the railroad industry requires the adoption of some limitation on the right of management to abolish positions. In some instances the proposal is for a "controlled attrition approach," as in the Southern Pacific agreement with the Order of Railroad Telegraphers, under which the rate of job abolition is limited to natural attrition or a fixed percentage of the working force, whichever is less. This approach, it has been said, protects something more than people; it protects the job itself. In other instances the proposal is for the limit of "natural attrition," which restricts the rate of job elimination

[12] *Report of the Railroad Commission*, pp. 112–113.

to the rate of labor turnover resulting from death, retirement, resignation, discharge for cause, and possible promotion outside the bargaining unit.[13]

In the language of Emergency Board 151, "The only appropriate objective of natural attrition consonant with public policy is the leveling of peaks and valleys of employment, not the impeding of necessary innovation. Meaningful employment security cannot be achieved at the expense of change. The goal of a natural attrition program should be to assure that technological and organizational change will be introduced on a planned, orderly basis, and its result should be an average level of employment no higher than would be the case in its absence."

In some circumstances an attrition program may be a useful contribution to a manpower program in an industry faced with continuing technological change. But it is not a universal or general-purpose tool. Some industries and companies are expanding as others are contracting; some have higher natural attrition rates than others, depending on the proportion of women employees, age composition, location, and other factors; some have a higher proportion of temporary employees typically excluded from any attrition program. It may not always be feasible or practical to distinguish between changes in employment attributable to variable output and economic conditions and changes in employment directly related to new technology or new methods. An attrition program may be effectively frustrated by seniority rules which permit little or no transfers among related jobs. An attrition program confined to a single occupation may have little purpose other than to restrict the rate of introduction of technological change. A program of attrition may be applied to a group of employees above a certain age or with longer service records, rather than to all employees. The Presidential Railroad Commission proposed such a program for firemen in other than passenger service. Thus, its appropriateness must be examined separately in each situation.

6. Manpower displaced by technological change should be provided a schedule of lump-sum payments or weekly benefits, above normal unemployment compensation, to facilitate transfer to new jobs and locations and in partial compensation for the loss of preferred positions and economic rents. This principle has now come to be recognized as the first requisite to orderly adjustment of manpower. The benefits should be higher the longer the period of service.

[13] See the excellent discussion of Emergency Board 151, December 31, 1962, pp. 24–31.

In view of a continued decline in demand, these policies are designed to facilitate a more orderly withdrawal of labor resources from operating classifications, to discourage unnecessary new recruitments, and to use more effectively the labor force remaining in these occupations in the industry.

COMMENT

GEORGE WILSON, Indiana University

Dunlop's treatment of railroad-industry problems differs from that of other contributors to this volume in that it is more narrowly based. His immediate goal is to help effect an orderly transition of internal labor flows in the railroad industry in the face of a combination of technological change and a relative decline in the demand for railway service. This is a vexing problem but at least it is specific. It lends itself to political compromise on behalf of union and management, assuming emotions can be held in check. In the long run the ultimate solution is clear. We can only question the way in which it should be effected. This question does not require any sophisticated analysis of economically optimal solutions. Rather, the problem is to devise a pattern of adjustment which both sides will find acceptable.

But Dunlop is not content merely to summarize a program for orderly readjustment. He is concerned as well with why adjustment has been so difficult in the case of firemen and engineers. I find his five factors, which have general applicability in the context of technological change, to be convincing if not very exceptional. His method of moving from the specific to the general is more informative and provides a more satisfactory outcome than, for example, the Healy paper. This is no criticism of the latter since it is always easier to discuss a specific problem whose nature is clear and in which the direction of desirable change is uncomplicated by doubt.

It is obvious that ignorance expedites vested interest and bias while knowledge at least restricts unwavering irrationality. Dunlop's discussion is reassuring in this regard although I suspect that he is not confident that strikes can be averted despite careful analysis of the manpower structure. We can hope that our findings will at least guide public policy and attitudes on to approximately correct paths despite innumerable small instances of inefficiency, waste, and inequity. We can also hope that needed changes can be induced by our work before the crisis stage is reached.

THOR HULTGREN, National Bureau of Economic Research

A currently important transportation problem is that of finding a useful place for labor displaced by technological improvement. The problem is especially acute in the case of train and engine labor. The Diesel locomotive has made the usefulness of a whole craft, the firemen, questionable. The system of wage payment in train and engine service is peculiar. And the industry is relatively stagnant in size. The Presidential Railroad Commission of which John T. Dunlop was a member developed a large body of data bearing on the problem. In his paper, Dunlop considers six lines of policy. One is reliance on attrition—no separation from service except that occasioned by death, retirement, voluntary quitting, dismissal for cause, and perhaps decline of traffic. On the whole, Dunlop rejects that solution, which would greatly delay the realization of economies. He favors broader seniority districts, compulsory retirement at age 65, reliance on additional workers rather than overtime, training for other jobs before present jobs are lost, and protracted separation allowances. Broader districts would certainly often be better than firing old employees on one part of a railroad system while hiring new ones on another part. Because a railroad is territorially far-flung, however, wider districts would sometimes involve considerable social dislocation. As to hiring additional workers rather than paying overtime, it is often not feasible to replace a train crew at the end of straight time. Some people would question whether workers should be thrown out of the labor force automatically at any specified age; this is a growing problem in the economy at large. Dunlop points out, however, that train and engine workers are unusually old and do not possess broadly transferable skills. He draws an ingenious contrast between locomotive firemen and boilermakers in railroad repair shops. Diesels threatened the jobs of both, but boilermakers had a transferable skill and put up much less resistance.

For firemen employed less than ten years, PRC recommended separation, with allowances to be paid for periods as long as four years, depending on length of service. Similar allowances have been required by the Interstate Commerce Commission for workers displaced by railway mergers. Railroad managers complain that there are no analogous arrangements in other industries. Certainly it is not fair to cast the entire social burden of transition on the displaced workers. On the other hand, law and policy urge the railroads to be efficient; the ICC is told to consider efficiency when passing judgment on the

level of rates and fares. Should railroads nevertheless be deprived for a time of the benefits of efficiency? If displaced workers are not absorbed elsewhere, that would seem to indicate imperfection in the labor market, a responsibility of the economic community at large. However, when separation results from greater efficiency, there is at least new income out of which allowances may be paid. In contrast, when the Rutland went out of business, the ICC refused to burden the estate of the defunct railroad with separation allowances.

Dunlop draws an optimistic lesson from history. I can think of a work rule in newspaper printing that has seemed to "frustrate technological change" for at least two decades. How long is long?