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Variations in Work-Discipline Among
Victorian British Railway
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Work discipline was a problem on early railway construction crews. All employers face the problem of extracting regular performance from irregular workers. But the tools most employers use to insure steady work were not available to the nineteenth century railway contractor. In Victorian Britain, railway construction was highly cyclic. The British railway net was constructed in a small number of intensive fits each of about three or four years in duration (Lewin 1936). Between these peak periods very little was built and employment in railway gangs nearly disappeared. The alternation of peak and trough undermined many strategies for creating labor discipline. Long term incentives were clearly out of the question. Steady work could not be rewarded pensions or chances of promotion. The destruction and reconstitution of railway gangs diminished the chances of long-term employment with one contractor. In peak periods firing and the selective recruitment of personnel was difficult though not wholly impossible. The 1846 Select Committee on Railway Labourers documented the disciplinary problems that arise from such lack of control. Subcontractors absconded with monthly wages. Workers drank on the job which caused incessant accidents. Brawling was common, lateness endemic and all of these multiplied tenfold on payday.

It is easy to exaggerate this crisis in industrial discipline. Contractors did have tactics for controlling their labor force. One method is well-known to the general reader- the hiring of "coolie" labor or ethnic minorities. In America railways were built by Chinese, in France by Italians; in England they were built by Irishmen. These minorities were desperate and economically destitute. They provided a

cheap docile labor force that was easy to discipline. This paper will focus on two less well-known tactics of industrial discipline that were used on British construction gangs of the 1840's. One is the use of indebtedness and the withholding of pay to reduce turnover and create credit dependency. The other is the use of company-financed clergy to monitor the men and promote regularity and sobriety. I will not address the question of how well these worked: the effectiveness of disciplinary strategies is often a mystery to the employer himself. Instead I will ask where and when these tactics developed- why they show up on some railways but not on others. An examination of differences in the use of indebtedness or clergy can illuminate the underlying reasons why these forms emerged and will allow us to make some guesses as to what other industries or eras might support such tactics.

The data comes almost entirely from testimony given to the 1846 House of Commons Select Committee on Railway Labourers. The Select Committee took evidence on working conditions of railway construction workers in all parts of England Wales and Scotland in 1845 and 1846. On these labourers, referred to in the Report as navvies, we have rich cross-sectional data on the quality of work-life in the middle of the largest railway construction wave that occurred in British history.

The Committee was particularly interested in the use of truck shops or company stores to create indebtedness among workers. Hilton (1960) has argued from limited but suggestive evidence that obligations to truck shops rarely continued beyond payday. However the Select Committee found enormous variance in the use of indebtedness between paydays. Some railways, such as the

Croydon-Epsom or those built by Morton Peto paid weekly or by the fortnight. Others such as the Lancaster and Carlisle paid by the month. At the farthest extreme, the Lincoln, Sheffield and Manchester paid only five times a year. Between paydays, workers who ran out of money were dependent on their employers for subsidies and advances on their wages. Since these could be legally given or withheld at the employer's discretion, this was a powerful tool of work-discipline. Furthermore, the long waits between paydays kept cash out of the worker's pockets and prevented them from quitting and leaving the works. In this paper, short pay will refer to weekly or fortnightly pay periods. On these the effects of subsidies are likely to be minimal. Longer pay periods, such as a month or more will be referred to, obviously, as long pay.

Parliament also worried about the spiritual state of the navvies and took extensive evidence on their religious life. Occasionally the men themselves financed their own churches. More often the employers paid for religion to be brought to the men. The companies would hire either preachers or schoolteachers. Often these two functions would be performed by the same individual who would run classes on weeknights, services on Sunday and give general pastoral aid on the rest of the week. Sometimes these men would be ordained clergy. Othertimes, they would be volunteer Scripture readers. Most of the time the denomination was Church of England; occasionally they would hire a non-denominational Protestant. Despite the large fraction of Irishmen on the lines, the company never supported Catholic priests. For convenience, schoolteachers, lay volunteers and ordained ministers will all be referred to as clergy.

The standard argument in the literature (not that it has misled very many people) is that short pay and clergy are the products of the noblesse oblige of large contractors while long pay and the absence of clergy stems from the economic rapaciousness of the smaller contractors. (Francis 1851, Williams 1852, Clapham 1930, Coleman 1965, Peto 1893, Bagwell 1974) Some railways financed their railway cheaply by tolerating long pay. Railway works were generally built by contractors who sublet to smaller men. Many of these subcontractors were shoestring operators with little experience and less capital. They would bid for work at unrealistically low prices and find themselves committed to jobs they could neither finance nor profit from. These small jobbers then adopted the truck system and in essence went into the grocery business. What could not be earned by making railbeds could be earned by selling overpriced produce to a captive market. The credit that long pay forced upon workers was limited to goods from the grocery store. The same tight budget that induced this kind of cheapness would be unlikely to support either schools or church services, and thus clergy would be absent upon these lines.

The literature has emphasized how certain prominent big-name contractors were immune from the temptations of the truck system. The nineteenth century literature focussed on Sir Morton Peto- member of Parliament, second largest contractor in Britain and vocal advocate of short pay and the use of clergy. Humane pay and religious instruction are explained by his moral influence and deep religious sentiments. (Francis 1851, Williams 1852, Peto 1893, Clapham 1930) A less quaint explanation comes from Terry Coleman. He argues that large big name contractors needed to maintain

a corps of reliable dedicated navvies who could serve as a semi-permanent mobile workforce. This required the creation of some esprit de corps and thus a limitation of the degree of exploitation.

It is hard to explain the location of indebtedness or clergy by the internally consistent policies of small-scale or large-scale contractors. Large contractors often used different policies on different railways being constructed at the same time. Consider the case of Thomas Brassey, the largest railway builder in Britain at the time. His pay and clergy policies are utterly inconsistent. In 1846, he paid by the month on the Lancaster-Carlisle, the Caledonian, the Scotch Central and the Trent Valley Railways. He paid by the fortnight on the Chester and Holyhead. The English workers on his French contracts were also paid fortnightly. He used clergy on most of his railways. Exceptions were the Scotch Central and the Trent Valley. (Helps 1874, Select Committee 1846) This inconsistency should not be surprising. All of these railways were built simultaneously. It is difficult to administer works in such far flung sections of Britain and Europe. A great deal of autonomy must have been given to Brassey's subordinates. Observations of Brassey at work have shown that Brassey spent no more than a few days on any particular line. His time was usually taken with marketing and with big technical hitches. (Helps 1874) As such he was rarely involved with the minutiae of industrial discipline; his policies were largely set by the subordinate contractors who worked underneath him. Peto may have had a very different managerial style. Overall however, the focus on prominent big-name contractors seems to obscure the issue. There may be some relationship between work discipline and the

solvency of the invisible men who administered the railway works. However each job called for its own particular kind of work-discipline. The underlings of large contractors may have been adapting to the exigencies of the individual job.

One important factor that the traditional story ignores is that pay periods and clergy use varied strongly by region. Both short pay and clergy were typical of Southern and Eastern England; long pay and the absence of clergy were typical of Northwestern England, Wales and Scotland.

Table 1: Pay By Region

	Scotland	Northwest Eng.	Southeast Eng.	Total
Short Pay	1	2	14(6)	17(9)
Long	6	5	2(2)	13(13)
Total	7	7	15(8)	30(22)

Table 2: Clergy By Region

	Scotland	Northwest Eng.	Southeast Eng.	Total
Present Clergy	2	4	10(2)	16(8)
Absent	4	3	1(1)	8(7)
Total	6	7	11(3)	24(15)

Note: Figure in parentheses indicates number of Southeastern railways with given attributes not constructed by Peto. Northwest England represents all of England and Wales North of London and Bristol and West of Southampton and Leeds. Southeast England is the remainder.

The situation is complicated by Peto's railways. These were concentrated in the Southeast, and could thus create a spurious regional effect. Merely examining non-Peto railways suggests that the regional trend in clergy use is in fact due to Peto. However, the bias of Southeast England towards short pay clearly exists in non-Peto railways. This can be best explained by the ethnic composition of the Southeast English labor force, and the consequences this had for worker militancy.

Indebtedness and Labor

Workers on railway lines had extremely good reason to prefer short pay to long pay. Cash in hand allowed one to avoid the company store. The witnesses at the 1846 Select Committee on Railway Labourers are virtually unanimous in their evidence that workers hated the truck shops, complained about the monopoly prices associated with truck, and preferred ready money at frequent intervals. Besides truck, there were other reasons for liking shorter pay. Subcontractors were in the habit of disappearing on payday with the money for their crews. Defaults occurred on the Swaffham-Dereham, on the Great Western and the Caledonian Railway, as well as the Glasgow, Dumfries and Carlisle. (1846 S.C., Handley 1970) For a subcontractor on an unprofitable job, a fast exit with a month's pay for sixty or seventy men could be an irresistible temptation. Short pay reduced the potential value of each pay-packet and increased the likelihood of the navvies receiving their wages.

However it is incorrect to assume that because workers sought short pay periods that short pay will be a function of that classic measure of labor strength, labor scarcity. My argument is that is not that Northern workers were weak; they were distracted. In the North,

workers exhausted their strength in campaigns to ban Irish immigrants from the line. An incredible amount of energy was devoted to ethnic rivalries. The Lake District, the Borderlands and Lowland Scotland all saw massive riots against Irish navvies. Scotch navvies and Irish navvies, each numbering in the hundreds, faced each other off at Penrith. In Edinburgh, the Irish were driven off the works by another hundredfold mob of Scotch workers. One wave of anti-Irish incidents started on the Lancaster-Carlisle, moved up the West Coast of Scotland to Edinburgh, and then moved down the East Coast to Berwick. Treble and Handley have traced the struggle against the Irish; the history of navy mobilization in Scotland and the north of England is essentially one of ethnic exclusion. The absence of these incidents in the South is not the product of the tolerant quality of the English navy. Nearly every Southeastern line for which there is information shows an absence of Irish employees. This is partially due to the fact that there are very few Irishmen in the Southeast. This is partially due to labor militancy. On the London and Birmingham, Irish were banned by the Englishmen employed on the works. Only demographics kept such incidents from being more prevalent.

Why should this preoccupation with the Irish distract workers from the issue of long pay? First, the Irish represented a real source of scab labor that could undercut any serious non-Irish attempts at labor mobilization. Treble has argued that Irish were paid wages consistently below the British standard. Testimony given before the Select Committee shows the inferior wages, accommodations and working conditions that Irish had to accept. The Irish Potato Famine was at its height. Refugees were escaping from Ireland in droves. In their

desperation, Irish were happy to accept any conditions that were offered them. They were present in some districts in large numbers. In Ayrshire they were better than fifteen percent of the working population. They thus provided a large supply of scabs to undermine any serious mobilization by non-Irish workers against long pay.

Yet even had Irish been willing to join with Scotch workers in a combined class-based movement, their mere vulnerability as a target may have pre-empted more serious strike action. A mobilized band of English workers had a choice of actions it could take to improve its lot. It could strike for higher wages or better conditions. Alternatively, it could move to restrict the labor force by banning Irish. The latter is a less risky operation that requires a bare minimum of organizational resources. A strike entails the long term organization of a large body of men. A large number of men must be induced to risk being fired or going without pay. This commitment may have to be maintained over a long period of time. A drive against the Irish is a short-term and almost impulsive action. It takes large numbers, but these masses are only required for a day or two of sustained violence. Repression is likely to be confined to a handful of leaders, if it is taken at all. No strike fund is required; no long-term incentives to maintain loyalty are required. Thus areas with an Irish population to ban will be tempted to divert their energies towards the pursuit of this organizationally easy goal. Once the Irish have been banned, labor must turn its energies to other goals. Serious striking must be resorted to for further advancement. The banning of the Irish is thus likely to precede the banning of long pay.

Obviously this will only hold where the maintenance of long-term

solidarity is problematic. A modern construction union can easily pursue ethnic and wage demands simultaneously. However, navvies lacked both the formal associations and the informal bands of association that would have provided the cohesion for a two-front offensive. The mobility of navy work prevented the development of navy communal ties. No permanent navy communities developed. The navvies on any line came from a wide variety of disparate locations. The South Devon was built by men from four Southwestern counties. (1846 Select Committee). The Knaresborough Viaduct in Yorkshire was built by a labor force that was less than 40% local. The itinerant majority came from a wide variety of locations: North England, the Midlands, Scotland, Ireland. Small gangs may have stayed together and acted as a unit. The larger labor force was split among locals and non-locals; the non-locals came from everywhere under the sun. No formal organizations existed to compensate for this fragmentation. Both Peto and Helps noticed a complete absence of trade unionism among navvies. (1846 S.C., Helps 1874) Sick clubs were scarce and hard to maintain. Many would have collapsed without contractor intervention. This did not completely pre-empt striking. Handley showed that in Scotland strikes were common. These were wildcat attempts; they were poorly organized. In Irish areas, they were totally unsuccessful. (Handley 1970)

What empirical evidence can be brought to bear on this theory?

1. One should expect a high correlation between long pay and the presence of Irish workers on the line.
2. One should expect long pay where Irish constitute a large percentage of the labor force. The Irish will be harder to ban in counties where they are numerous. Thirty Irish can be evicted in a trice. Thirty thousand potential navvies are tougher

to deal with.

3. We should not expect a correlation between labor scarcity and short pay. The theory states that ethnic rivalries provide an equal temptation to strong and weak labor forces given a low level of organizational sophistication.
4. We should find labor demands to shorten pay periods concentrated in regions that have few Irish. In highly Irish regions, ethnic demands should pre-dominate.
5. We should find in low-Irish regions successful strikes that ban long pay.

Were Irish absent on lines with short pay? Actual data on the ethnic composition of railway construction crews is hard to find. On nine railways this data was available. I dichotomized the railways into on one hand, those railways with substantial numbers of Irish, and on the other, those with only trivial numbers of Irish, or no Irish whatsoever.

Table 3: Pay By Irish on Line

	Long Pay	Short Pay	Total
Present	4	0	4
Irish			
Absent	1	4	5
Total	5	4	9

The table speaks for itself. Long pay was overwhelmingly associated with the presence of Irish on the line. There is only one exception to the rule- the Lancaster-Carlisle. This exception is only apparent. The Irish had been driven from the line immediately before Parliamentary evidence was taken on pay periods and working conditions. The ethnic war was still in flux. The workers were just celebrating

a very recent victory. The workers had not had time to press for new demands.

Was long pay located in counties with heavily Irish populations? The 1851 Census gives us the birthplace of the inhabitants of the counties of Britain. From this we can infer which counties had large populations of immigrant Irish. From this I determined the ethnicity of the counties surrounding each railway**. Table 4 shows the results of the analysis.

Table 4: Pay By Percent Adult Males Irish

	Short	Long	Total
High % Irish	5	12	17
Low	12	1	13
Total	17	13	30

Note: Low Irish Counties have .015 or less of the male population above the age of 20 Irish. High Irish counties have over .015 of their adult males Irish. The unit of analysis is the railway.

Short pay seems to be located in the counties with negligible Irish populations. Only one railway in a non-Irish county had long periods of indebtedness; only six railways out of thirty not fit the general pattern.

I predicted that short pay should not be effected by labor shortage or labor demand. Both strong and weak labor forces should be distracted by the Irish issue. Does this work out? One measure of labor supply is the population density of the county containing the railway.

** This is actually somewhat complex. When I knew the pay system at only one point along a railway, I assumed the railway to be entirely in the county for which I had data. When I knew the practice of an entire railway, I calculated the % Irish for every county the line was in, and then took the mean.

Why population density? Navy work is not terribly skilled. Anyone who can handle a pick or a shovel can find work in a construction gang. Thus the labor supply will be that of unskilled physical labor. Population density is a good measure of the availability within a county of unskilled men aged 15-50.

Table 5: Pay by Population Density

	Short	Long	Total
High Pop. Dens.	7	8	15
Low	10	5	15
Total	17	13	30

Notes: Low population density is used for railways whose average county density is less than 4 people/acre. High density railways are the rest. Location of railway determined as in Table 4.

The table shows a trend in the direction of what a labor strength theory would predict. Areas with low density and thus scarce labor tend to have short pay while areas with surplus labor tend to have long pay. But the relationship is quite weak. Fully 40% of the cases are exceptions. The table is not statistically significant, even at the .3 level. Controlling for other variables and then cross tabulating pay with population density does not alter the basic weakness of the relationship. In other words, as predicted, there is practically no relationship between market labor strength and short pay.

Was the South of England where Irish were scarce the location of successful strikes against short pay? The existing secondary literature suggests this is wrong. Fortunately for my hypothesis the evidence on this is somewhat incomplete. Coleman and Handley have both maintained that strikes among navvies were rare; they argue that firstly, employers tended to fire strikers and secondly that the

massive boom in railway building allowed the discontented to easily pack up and find alternative employment elsewhere.

Logically we might expect a lot of strikes in times when labor demand is at a peak. But theory aside, what do we know about labor militancy among navvies? It seems fairly clear that there was an absence of organized trade-unionism on the railways. Peto testified before the 1846 Select Committee that he was unaware of any trade unions on his line. Helps has maintained the same for Brassey's lines. The literature on trade-unionism in the construction industry-of which railway navvying was a branch- depicts the 1840's as being a serious slump in both striking and general union activity. (Postgate 1923, Webb 1920, Cole 1932) Postgate shows that masons, the vanguard sector of artisanal construction work were unable to maintain lodges of their national union nowhere in Southeast England besides London. The one incident of militancy- an 1841 mason's strike against Peto over the Nelson's Column contract failed miserably. (Postgate 1923)

Yet despite the lack of organized unionism, wildcat strikes do seem to have occurred. The Chester and Holyhead railway was plagued with strikes from inception to completion. Peto did mention a rash of strikes in Anglesey in 1846 (1846 S.C.) Machinery had to be developed on the Conway Bridge to circumvent a long-standing combination. (Byegones, 1884) On the South Devon Railway at the Marley Tunnel, workers struck twice- once over an absence of safety precautions and once over long pay. Both strikes worked; subsequently the South Devon paid by the fortnight. At Ramsgate Station on the Southeastern Railway, there were several work stoppages over truck, although none of them seems to have been successful. (1846. Select Committee)

At best we have only one documented case of a successful strike against long pay in the South. However the strike material suggests that navvies may have been more strike prone than is now currently believed. In Scotland, Handley exhumed a large number of strike incidents by a systematic culling of the provincial press. The provincial press picks up a large number of strikes which other commonly used sources, Parliamentary testimony, the railway trade journals, organized union records, all seem to miss. To my knowledge no one has done a comprehensive search for navy strikes using newspaper sources for any area outside Scotland. Pending an investigation of the provincial press, our test of the regional location of successful strikes against truck is inconclusive. Isolated examples suggest some successful strikes in the south. Isolated examples show mobilization against long pay. The data is much too sketchy to provide proof that short pay was eliminated by a wave of radical worker mobilization.

The proposition does remain plausible however. The theory is consistent with the high correlation of Irish on the line and long pay, the correlation between areas of high Irish density and long pay, and the absence of a correlation of labor scarcity and long pay. Furthermore it is difficult to imagine an alternative hypothesis that would explain the strong regional bias in pay period. Until newspapers disconfirm the theory or until a viable alternative explanation is established, ethnic segmentation seems to be the best explanation going of long term pay and indebtedness.

Clergy

The use of clergymen and schoolmasters on the line has been treated in the literature in a similar fashion to the truck system. The impetus for the use of clergymen is seen as deriving from the Christian conscience of Sir Morton Peto and diffusing from there to progressive contractors. To some extent the non-businesslike focus of the literature seems reasonable. At first glance it is hard to discern a rational economic incentive that could possibly explain the use of clergy by railway contractors.

Religious conversion is a slow procedure. It takes long term exposure to a community of believers and continual support from a circle of dedicated friends to produce any serious long term change in beliefs. For a settled industrial community such as New Lanark or Swindon, this would seem to be a valid strategy of labor control. A minister could work a few employees into a permanent seed community. These Christians could then spread their influence among the rest of the employees. The lack of turnover would give the minister and his seedlings a captive audience for their doctrine. The dependence of permanent employees on one employer for promotion would lead workers to impress their pro-Christian boss by seeking out the local missionaries. Migratory railway crews seem to be a less promising target. Navvies are characterized by high turnover, shifts up and down a line as the work requires, and short job tenures followed by dispersion to points unknown. There seems to be little chance to institute long term clergyman-navvy contact necessary to found a seedling community. Given the absence of long-term incentives it is hard to see how even a public display of religiosity for appearances sake could possibly help a navy economically further

his career.

Long-term conversion or long-term imitation religiosity thus are unlikely to have been a contractor's goal in their worker instruction programs. One would have to assume some sort of religious consumption among contractors. However an alternative explanation is possible. Clergy might have been used to obtain some sort of short-term benefit. One possibility was that clergy were used to police the works. Clergymen testified before the 1846 Select Committee that they were successful in breaking up brawls and reducing the amount of rough language used on the lines. Another benefit is that time spent in church is not time spent drinking or fighting in the street. On the Caledonian railway the local pub was closed on Sunday and used for church services. (1846 Select Committee). Such benefits are minor but are certainly real.

However the only interest a contractor has in sobriety is the effect sobriety has in work-performance. There is no evidence that lines with clergy had lower absenteeism or better quality work. Evidence on efficiency must have been just as inchoate and indeterminate to contractors as it is for the historian today. Even if Sunday services increased the efficiency of a few, clergy were rarely hired in sufficient numbers to that their effect could have been very large. Scripture readers were usually hired at the rate of one for every one thousand or two thousand workers. Peto explicitly used the ratio of one for every nine-hundred men. Eight readers were given the job of supervising all of the navvies working on the Chester and Holyhead- a line spanning the entire North Welsh coast. The supervision of the lives of the workers involved can not have been very close. Most likely a handful of workers came into close contact

with the railway ministers- and the rest of the workers were largely unaffected.

What is the point then of providing such a token moral presence on the railway? One answer that comes to mind is public relations. Sir Morton Peto was not the only Victorian businessman with deep religious sensibilities. The nineteenth century brought a renaissance of evangelism to Britain; it manifest itself in a flowering of missionary societies and world-wide attempts to convert the heathens. The London Mission Society was financing expeditions to bring spiritual guidance to North American Indians, Pacific Islanders, Hindus in Ceylon, and Zulus in South Africa. It should not be surprising that similar attention was given to the heathen at home.

Railway companies were often approached by religious members of communities on the right of way asking the company to make various and sundry concessions to Christianity. The North British Railway was continually pressed by petitions for the abolition of Sunday trains. (Railway Times, 1847) Peto's scripture programs were result of his being approached by influential members of the City Mission Society. (Peto 1893) The religious programs on both the South Devon and the Lancaster and Carlisle railways were instituted at the explicit request of local clergymen and community notables. The railway companies spent good money to finance these concessions. We are still left with the open question of why the railways didn't reject these requests out of hand.

The success of the evangelists was aided by the railway companies dependency on the community for cheap land. The railways were built on rights of way that were strongly fixed by engineering

considerations. What happened to the railways is common to any enterprise that must purchase a large number of fixed locations for a major project. The lucky landlords on the right of way jacked up their prices to the point of extortion. The effects of such monopolistic land pricing can be exaggerated. (Pollins 1952). Nevertheless works were delayed and costs were inflated by the protracted haggling and negotiations. (Francis 1851, Williams 1852) Frequently work would begin on the more easily procured sections of the line while disputes over the more contended pieces of real estate creaked on through the machinery of arbitration and the courts.

The Railway Act gave the company the ultimate legal right to the land. Thus the central tactics of the disputes would be twofold: the exercise of legal sanctions against the landholder, and the use of cash incentives at the bargaining table. However gratuities could be used to sweeten the pot and help draw matters to a speedy conclusion. Railway companies built innumerable ornate bridges across the right of way. On the Trent Valley Railway, one landlord insisted on, and received, railway policemen that would monitor the workers near his property. (1846 S.C.) The Chester and Holyhead board of directors noted at the outset of the land procurement process that undisciplined navvies posed a continuing grievance to railway landlords. They then moved a company policy of hiring clergymen. (Coleman 1965) This strongly suggests a form of public relations work- clergymen are used to cool out local land holders.

What kind of evidence can be used to support this theory? Firstly the use of clergy should vary directly with the discretionary budget of the railway company. Why should this be so? While clergy are being used as a pawn of real estate negotiations, they are hardly

the major weapon in such a struggle. The main battle is fought with lawyers and negotiators. When a railway has extra money at its disposal, then hiring clergy might make sense. The three hundred pounds that religious instruction might cost would be worth the savings of several thousand pounds that could result from an early and inexpensive property acquisition. However, the saving is unpredictable. The readers may not impress local landlords. The final expenditure could be irrelevant. Religion here is thus an analogue of advertising, landscaping, or sponsoring a Little League team. When money is available, companies invest in good-will. When money gets tight, such frumpies get cut. Thus company organizational slack should be a critical factor in clergy use.

A second piece of evidence involves the presence or absence of contractor financial support for clergy. There are at least two sources of funding for religious instruction on a railway gang. One source is the company which is commissioning the railway. The other source is the contractor who is actually building the line. If labor control is the critical issue, then both the company and the contractor have an interest in obtaining clergymen. Both parties ought to be willing to finance instruction. If on the other hand, clergy are used to obtain cheaper land, then the company would have a clear interest in obtaining clergy. The contractor, however, gains nothing from this. He should be unwilling to spend his money on religion.

A preliminary example can be given showing the relationship between company slack and clergy use. Consider the Muirkirk and Ayr Railway. This was an extension of the Glasgow, Paisley, Kilmarnock and Ayr line which was under construction in 1846. Eagerly supported by local iron interests, the company began construction before

construction before Parliament had legally approved the line. The Act was defeated in the House of Commons and construction had to be cancelled. (Lewin, 1935) This project was obviously in the preliminary stages and was clearly a tentative affair. One would anticipate that the company would put a minimum of resources into the building of this particular branch, since they were waiting for the go-ahead from Parliament. Thus the Muirkirk and Ayr is the archetypical low-slack line. It did not use clergymen or instructors on the line.

Of course, more satisfactory evidence would entail use of a larger sample. Therefore for as many railways within my sample as possible, I attempted to find data on the total capitalization of the parent company. This was obtained from published budgets which were available in the contemporary railway trade journals. For the seventeen budgets I obtained, I defined the capitalization of the company as the total historic receipts before expenditure in the capital account. For all railways under construction in 1846, I used an 1846 budget. For railways built in earlier periods, (a very small minority of my sample) I used budgets a third of the way into the construction process.

Table 6: Clergy By Total Capitalization of Company

	Clergy Present	Clergy Absent	Total
High	8 (4)	0	8 (4)
Capital			
Low	4 (2)	5	9 (7)
Total	12 (6)	5	17 (11)

Notes: High capitalization is greater than 500,000 pounds, The Muirkirk and Ayr is coded as low, despite the higher capitalization of the parent company to reflect tentative construction. Figures in parentheses represent the count with Peto's railways missing.

The data clearly supports the notion of a strong correlation between company slack and clergy use. Less than 25% of the cases are exceptions. There are no cases of highly capitalized companies without clergy. Furthermore, this finding is not the product of the evangelical drive of Peto. With Peto's railways held out of the analysis, the relationship still holds with 80% of the cases being in the predicted cells.

Now who financed these clergy? It was quite common for railway companies to pay for clergy without any contractor support. Clergymen on both the Lancaster-Carlisle and the Caledonian railways were paid for primarily by the railway company, with supplementary contributions from local townspeople. The South Devon railway footed its entire religion bill. On the Croydon-Epsom, there was in fact equal financial contributions from both the company and the contractor. However, this can be somewhat deceiving. The scripture reader testified to the 1846 Committee that he was in frequent contact with the directors of the company, while the main contractor all but ignored him. The contractor thus has paid his share, but he hardly seems to be evincing any interest. Another apparent exception is the Chester and Holyhead. Here too company and contractor split the costs. But this exception is also illusory. The Chester and Holyhead was unique in its decision to adopt clergymen BEFORE bids were submitted for specific work contracts. In most cases, clergy were introduced AFTER a contractor had been selected and a price for the job had been fixed. On the Chester and Holyhead, a contractor would have known he was expected to provide scripture readers and could written this into the price of the contract. He thus would have passed the extra costs back to his employer. In the more normal case, the contractor found

clergy an unanticipated expenditure. Forced to pay for such assistance out of his own pocket, the contractor chose not to contribute to the chapel. The blatant exception then seems to be Peto. Peto paid for all his own Scripture readers, without any obvious contribution from his client companies. This may have been public relations on his part; he may have had much better experiences as far as clergymen improving labor discipline. It may also be that the old literature is correct and Peto was truly a devout and spiritual man. If one turns a blind eye to this obvious exception, and one silences one's reasonable nagging doubts about the small number of cases on which my conclusions rest, one can see that there is some support for my basic contention. Overall, rich companies tended to hire clergymen. Overall, contractors tended to duck paying for clergy whenever possible. This is all consistent with a notion of clergy being a benefit to railway companies only; it suggests that clergy are a public relations device and not a serious tool of promoting labor discipline.

Conclusions

Most people are only vaguely interested in navy work in Britain in the 1840's. More people are interested in the phenomenal changes in work discipline as a whole that characterized the nineteenth century. The creation of bureaucracy and Taylorism, and the seizing of control of the labor process have fascinated students of labor history. What does this study allow us to say about these more basic and fundamental transformations? The big question deserves a very humble answer. None of my factual assertions have been overwhelmingly demonstrated. Many critical tests are missing. The existing tests are based

on a small and idiosyncratic sample. The cross-sectional design eliminates out knowing if debt and clergy were used in other periods. We have no idea if this was just a fluke of the 1840's. We have no sense of any kind of dynamic process that may have been shaping navy discipline over time. Even if one blindly overlooked these limitations, railway construction is a poor place from which to generalize to Victorian industry as a whole. The ephemerality of work organizations and the total absence of lasting ties of worker solidarity make it dissimilar to almost any other industry.

Given this long list of caveats against generalization, I am going to stop playing historian, start playing sociologist, and theorize about matters about which I can only guess:

1. The regional differences noticeable in railway construction may have had counterparts in other industries. Scotland may have been a harsh place to work for all people in all trades. Extensive regional differences become more plausible if one considers that they may have been caused by regional differences in labor force composition
2. Ethnic splitting of the labor force might worsen working conditions for all kinds of workers. However this is most likely to be a problem among unorganized workers and in trades in which entry is comparatively easy. The relationship between ethnicity, worker militancy and work conditions is largely unexplored in British industrial relations.
3. It has been suggested that the rigors of Victorian culture were a device to inculcate discipline within the working class. (Thompson 1967, Pollard 1965, Johnson 1970)

The upper class was clearly active in campaigns to reorganize working class leisure. Employers may have benefited substantially from the creation of a body of workers that was internally disciplined. But let us consider the much narrower question of whether employers paid for some sort of direct cultural transformation of their own employees, be it by education or long term religious proselytization. I would suggest:

- a) that such patrimonially financed religion was found only among wealthy firms offering long-term careers,
- b) in many cases this religion would not have been effective or economic, and
- c) many company attempts to provide education and culture were motivated more by attempts to impress other members of the upper class than by attempts to produce internal industrial discipline.

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