Industrialization and Labor Radicalism in Norway: An Ecological Analysis

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1. Introduction: The Bull-Galenson Hypothesis

The relationship between industrialization and labor ideology in Scandinavia has been a popular and oft-cited topic in recent political sociology. It all began nearly fifty years ago when the Marxist historian, Edvard Bull, Sr., presented a concise analysis of the ideological differences in the Norwegian, Swedish, and Danish labor movements.[1] Bull's analysis saw the Norwegian Labor Party as most radical, the Danish as most moderate, and the Swedish as falling somewhere in between. His explanation for this ranking included historical, structural, and individual factors but his primary thesis was based on the pace and timing of industrialization. Rokkan and Valen have concisely summed up this so-called 'Bull proposition' as follows:

> The Marxist historian Edvard Bull was, to our knowledge, the first in the North to try out a distinctly sociological analysis of the differences in the reactions of the workers to the political alternatives they were faced with. He focused on one central 'macro' variable: the *suddenness of the changes brought about by industrialization*. He developed a general proposition and he tried to show in some detail that it fitted the facts: the *slower* the growth of industry and the more of its labour force can be recruited from already established urban communities, the less leftist the reactions of the workers and the less radical their party; the *more sudden* the growth of industry and the more of its labour force has to be recruited from agriculture and fisheries, the more leftist the workers and the more revolutionary their party.[2]

Bull, himself, unfortunately did little to establish his proposition on a more secure empirical basis, but his ideas have been strongly reflected in the work of the labor economist, Walter Galenson.[3] I have taken up Galenson's work elsewhere and will not go into it here, except to say 1) that his views are almost identical with Bull's, 2) that he offers certain empirical indicators (none of them systematic,

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however) in support, and 3) that he is the perennially cited source for the Scandinavian situation.[4]

Most of those who make this citation are primarily interested in showing Norway as an example of radicalism resulting from rapid industrialization. Mancur Olson, Jr., uses it to strengthen his case for the disruptive aspects of rapid economic development.[5] Val Lorwin uses it to illustrate the contradictions of national character (since the once radical Norwegian movement rapidly became 'one of the most solid – yet independent and imaginative – labor movements in the world').[6] Leon Epstein uses it to show how heightened class consciousness is associated with 'explosive industrialization'.[7] William Kornhauser uses it to demonstrate the relationship between alienation and extremism on the one hand and 'discontinuities in community' on the other.[8] And, finally, Seymour Lipset uses it to refute the 'vulgar Marxist' contention that rapid economic development is the only way to stave off communism.[9]

Lipset sums up Galenson's picture of Scandinavia concisely when he states that 'wherever industrialization occurred *rapidly,* introducing sharp *discontinuities* between the pre-industrial and industrial situation, more rather than less extremist working-class movements emerged'.[10]

In the study mentioned above, I have analyzed the Bull-Galenson hypothesis on the total-system level, comparing time series and developmental factors for the three Scandinavian countries. In this article I would like to approach the problem on the level of communal aggregates for the Norwegian context alone. The goal will be to explicate, as far as possible, the relationship between labor ideology and industrialization in Norway between 1900 and 1921. After a brief historical sketch, I will introduce some relevant data from an earlier study by Björnset, and then turn to an extensive correlation and regression analysis of all 589 Norwegian communes.

2. Historical Sketch

The Norwegian Labor Party was founded in 1887 and competed in its first national election in 1903. Membership grew from approximately 1,600 in 1890 to about 10,000 in 1900, and on to a peak of about 105,000 in 1919 before declining again in the post-war depression. Its share of the national vote grew from 10 to 30 percent between 1903 and 1918, with respectively 4 and 18 representatives for the two time-cuts.[11]

The core of the original party leadership was recruited primarily from craft-based unions and Liberal-sponsored 'worker societies'. From about 1906 on, a strong opposition movement developed in the party under the leadership of Martin Tranmæl and his local party apparatus in central Norway. The movement was actually composed of two separate wings, with one faction following Tranmæl's brand of quasi-syndicalism and the other (strongly anchored in the socialist youth

movement) looking to the Russian Bolsheviks for ideological guidance. The pressure of events was such that Tranmæl managed to maintain control over the two wings through the election of 1921, but by 1923 the Comintern conflict had resulted in the splitting off of the Bolshevik-oriented group into Norway's Communist Party.

The party 'radicalization' we are interested in here took place primarily between 1911 and 1918. In the first of these years, Tranmæl's group sent out the radical 'Trondheim's Resolution of 1911', calling for basic changes in party tactics and structure; in the latter year the radicals officially took over the party. In 1919 the party joined the Comintern, and in 1921 the old moderate leadership finally broke away and formed Norway's Social Democratic Labor Party. In the election of 1921, Tranmæl's party (DNA) ran on a quasi-syndicalist/communist platform (with certain reservations in relation to Bolshevism), while the moderate party (NSA) ran on a clear platform of reform social democracy. The Tranmæl-ites received 21.3 percent of the vote as compared with 9.2 percent for the Social Democrats. It is this election which forms the major dependent variable for the current analysis.

3. Some Relevant Findings

Asbjörn Björnset has carried out a brief study of the Bull proposition in Norway for the period 1910–1920.[12] Using the 562 rural communes for this period, Björnset cross-classifies the degree of electoral support for the two socialist alternatives in 1921 with the percentage of the work force in industry in 1910 and 1920 and the absolute rate of change between these two dates. His first two tables are reproduced here as Tables I and II.

Table I. Electoral Support for DNA and NSA in Communes with Differing Degrees of Industrial Development, 1910–1920

Socialist party	Percent decline*			Percent increase*				
	10+	5–10	0–5	0–5	5–10	10–15	15–20	20+
DNA†	27.5	21.8	18.5	18.0	21.1	22.7	14.5	28.9
NSA ‡	6.1	9.2	8.5	7.2	5.5	6.8	7.2	7.6
DNA/NSA	4.5	2.4	2.2	2.5	3.9	3.3	2.0	3.7
N	(16)	(36)	(162)	(229)	(76)	(23)	(8)	(12)

* Percent change = percent in industry 1920 minus percent in industry 1910.
† Det Norske Arbeiderparti.
‡ Norges Sosialdemokratiske Arbeiderparti.
Source: Asbjörn Björnset, *Sammanheng mellom Industrialisering og Radikalisering?* Hovud-fagsoppgåve i historie, Bergen: Universitetet i Bergen, 1968 (mimeo), Table 13.

Björnset's data show a slight but definite tendency for the radicals (DNA) to be stronger in communes which *changed* the most, either declining or increasing in industrial work force. The highest average DNA percentages are found at the extremes of the change continuum (Table I). It should also be noted, however,

that the lowest average is found in the category with a 15–20 percent increase.

The only pattern discernible for the moderate party (NSA) seems to be a slight tendency toward strength in the declining communes, but not those which declined the most. We might characterize their strength in terms of industrial stagnation rather than industrial decline. In growing areas they show a relatively uniform distribution. As to relative strength within the socialist sector, it is clear that the radicals were proportionately the stronger in industrially declining communes.

Table II. Electoral Support for DNA and NSA in Communes with Differing Degrees of Industrial Development, 1910–1920*

Socialist party	Percent decline			Percent increase		
	10+	5–10	0–5	0–5	5–10	10+
DNA	26.5	26.0	24.0	27.2	30.4	32.6
NSA	6.9	12.0	15.5	10.9	8.1	7.4
DNA/NSA	3.8	2.2	1.6	2.5	3.8	4.4
N	(12)	(10)	(28)	(25)	(12)	(8)

* 95 communes with more than 30 percent of the labor force in industry in 1910.
Source: Björnset, *op.cit.*, Table 15.

These results are slightly altered when we control for the level of industrialization in 1910 (Table II). In those communes with more than 30 percent in industry as of 1910, the radicals were stronger in developing communes than in stagnating or declining communes. The three highest averages are all symmetrically placed within the categories of the developing units.

The pattern for the moderates remains approximately the same with the highest averages in the declining sector, although the third strongest group here shows up in the category with slight increases. The distribution of relative strength reverts to the DNA pattern for the total sample, with highest average ratios in the categories of extreme change.

Björnset's further analysis of the two variables by other statistical methods did not add much to these results. A series of four-fold tables seemed to indicate a relationship between industrial growth and DNA support (with no relationship at all here for the NSA), but when more powerful correlation techniques were applied this connection seemed to disappear. The zero-order correlation between industrial change (1910–1920) and electoral support in 1921 showed coefficients of +.08 for the radicals and –.08 for the moderates.

In terms of the Bull proposition we might sum up Björnset's data by saying that there appeared to be a slight relationship between the radicals and industrial change but that this change did not comprise industrial growth alone. The moderates, on the other hand, showed no relation to growth at all, but there was a slight tendency toward strength in declining or stagnating regions.

Three major factors must be taken into consideration, however, when interpreting Björnset's data. (1) His major independent variables (percent in industry and industrial change) were collected at time-cuts which straddled a period of

growth *and* decline. The core of Norway's industrial surge for this period took place between approximately 1905 and 1916, and Björnset's data are for 1910 and 1920.[13] (2) Björnset's rate of change was the simple difference between the percent in industry at T_1 and T_2. This 'absolute' rate of change is known to suffer from the so-called 'ceiling effect' and could have introduced a certain amount of error.[14] (3) Björnset's data apply only to rural communes, thus leaving out a considerable part of the variance in the total national vote of both the radicals and moderates. As we can see below (Table III) the administrative cities accounted for approximately 30 percent of the radical vote and a full 42 percent of the moderate support. By compensating for these three problems in the analysis which follows we should gain an interesting perspective for comparison with Björnset's preliminary study.

4. Industrialization and Labor Response

I have chosen the term 'labor response' in line with a research strategy based on a clear specification of the dependent ideological variable as a reaction to situations and changes which have preceded it in time. The election of 1921 is seen as a distribution of communal aggregates which have chosen the radical or moderate socialist alternative as a 'response' to ecological changes during the preceding twenty years.

Urbanization and Party Strength

The problem of grouping the data for analysis was one of the first methodological questions which had to be decided. Subgroupings at a level lower than the national sample were seen as desirable in order to avoid the problems of 'washing out' which seem to be a common result in ecological analysis.[15] At least two possibilities were open here: 1) an inductive method in which groupings are formed in accordance with criteria of common variance on one or another variable or 2) a deductive method in which groupings are decided a priori in accordance with specific theoretical or analytical considerations, such as regional divisions.[16] For this particular analysis I have chosen a combination of both methods by which the communes are divided into groups according to levels and characteristics of urbanization. Six categories will be used under the following headings:

1. Cities: The official administrative urban units *(kjøpsteder* and *ladesteder)* (N = 60).
2. Other urban: Communes with more than 500 people in urban agglomerations as of 1900 (N = 70).
3. Urbanizing: Communes with less than 200 in urban agglomerations as of 1900 and more than 500 as of 1920 (N = 73).
4. Urban-rural: Communes with between 200 and 500 in urban agglomerations as of 1920 (N = 89).

    5. Rural: Communes with less than 200 in urban agglomerations as of
       1920 (N = 297).
    6. Total country: All 589 Norwegian communes and cities for the 1900–
       1921 period with 1900 as the base for communal splits and population
       transfers.

These divisions are based on extremely precise measures of urbanization carried
out by the Norwegian demographer, Hallstein Myklebost.[17] The lower level of
200 is that set for inclusion in the data, and the upper level of 500 is arbitrarily
imposed as a meaningful urbanization level for primarily rural communes. In 1920
the average rural communal populations of Norway's most and least populous
provinces (Akershus and Finnmark) were respectively 8,000 and 2,000. For the
total rural population (i.e. other than administrative cities) the average com-
munal size in 1920 was approximately 3,500.

In Table III, I have presented the distributions of Socialist Party strength for
these six categories. In proportion to the total electorate, the NSA had a more un-
even distribution across the five subgroupings than did the DNA. The strength of
the moderates diminishes symmetrically along the urban-rural continuum, while
the radicals had greater relative strength in suburbs and other urban agglomera-
tions than they did in the administrative cities. The DNA was almost as strong in
newly urbanized communes as in the major cities, while the NSA was more than
twice as strong in the latter as compared with the former.

*Table III. Distribution of the Norwegian Socialist Vote, 1921, According to Urban Categories**

Urban category	Percent of total electorate		Percent of party's total vote	
	NSA	DNA	NSA	DNA
1. Cities	14.5	22.6	42.0	29.4
2. Other urban	11.5	24.6	27.5	26.5
3. Urbanizing	6.6	20.3	11.0	15.3
4. Urban-rural	5.1	17.5	6.6	10.2
5. Rural	4.4	14.2	12.9	18.6
6. Total country	9.2	21.3	100.0	100.0

* Oslo excluded. The NSA received 8.1 percent of the total vote in Oslo as compared to 35.4
  percent for the DNA.

In terms of internal party distributions, the NSA received nearly 70 percent of
its total vote in cities and other urban agglomerations as compared with approxi-
mately 56 percent for the DNA in the same areas. Once again, the variation is
much greater for the moderates than it is for the radicals, with ranges of 35.4
for the former and 19.2 for the latter.

Levels and Type of Industrialization

As the first step in the attempt to analyze the Bull proposition, I have tried to as-
sociate socialist strength with factors of static industrial development for the period

immediately preceding the 1921 test election. The goal here was to try to determine both the relationship to industrialism in general and, more specifically, the *type* of industrial complex, as far as this was possible from the available indicators. Seven indicators were chosen according to their diversity and availability in proximity to the 1921 time-cut:

1. Workers/capita (1910): Number of industrial workers per capita as recorded by *the industrial statistics* in 1910.
2. Workers/factory (1910): Number of industrial workers per industrial concern *computed from communal marginals*.
3. Work-years (1915): Total communal industrial activity as measured by 'work-years' (one work-year = 300 work days).
4. HP/factory (1915): Total *applied* mechanical horsepower per factory *computed from communal marginals* and *not including* electric horsepower employed in smelting and electrolytic processes.
5. Percent in crafts (1920): Percent of population, 15 years old and over, employed in crafts *(mester, håndverker, svenn,* etc.) according to the census of 1920.
6. Percent in industry (1920): Percent of population, 15 years old and over, employed in industry and mining.
7. Percent in construction (1920): Percent of population, 15 years old and over, employed in construction.

Indicator 1 is seen as a measure of industrialization at the peak of the 1905–1915 industrial surge, indicators 2 and 4 as two different measures of large-scale or 'heavy' industry, indicator 3 as the most direct measure of actual industrial activity, and indicators 5, 6, and 7 as measures of the type of industrial activity as of 1920. The last three are highly important since all three categories would be recorded as merely 'workers' and 'work-years' in the earlier industrial statistics (which ceased producing detailed communal data as of 1915). In Table IV, I have presented the zero-order correlations for these indicators with the two socialist alternatives for the total national sample.

Table IV. Levels of Industrialization and Socialist Vote, 1921, Entire Country

Indicator	NSA (N = 555)*	DNA (N = 589)
1. Workers/capita (1910)	.36	.35
2. Workers/factory (1910)	.22	.28
3. Work-years (1915)	.23	.15
4. HP/factory (1915)	.12	.20
5. Percent in crafts (1920)	.24	.17
6. Percent in industry (1920)	.38	.30
7. Percent in construction (1920)	.08	.20

* The number of regional units differs for each party due to the fact that the NSA did not enter voting lists in one county (Sogn og Fjordane).

The configuration of coefficients for the entire country indicates a moderate but consistent relationship between both socialist parties and industrialization, with few dramatic differences between the two alternatives. There are, however, at least three clear 'tendencies': 1) the radicals show slightly higher correlations for the two heavy industry indicators; 2) the moderates show a stronger relationship to the proportion of the work force engaged in crafts; and 3) the radicals show a much stronger relationship to the construction industry. All three tendencies are in the direction predicted by the Bull-Galenson hypothesis. The next step is to determine the effect of the urban-rural continuum on these patterns (Table V).[18]

Table V. Levels of Industrialization and Socialist Vote, 1921, Five Categories of Urbanization

Indicator	Cities		Other urban		Urbanizing		Urban-rural		Rural	
	NSA (59)	DNA (60)	NSA (69)	DNA (70)	NSA (69)	DNA (73)	NSA (82)	DNA (89)	NSA (276)	DNA (297)
1. Workers/capita (1910)	.53*	.08	.41*	.32*	.10	.37*	.19	.37*	.12	.19*
2. Workers/factory (1910)	.51*	.04	.45*	.16	−.02	.28	.05	.40*	−.01	.12
3. Work-years (1915)	.22	.09	.28	.13	−.05	.29*	.20	.18	.05	.22*
4. HP/factory (1915)	.49*	−.01	.22	.28	−.05	.22	.04	.19	−.02	.08
5. Percent in crafts (1920)	−.07	−.19	−.05	.08	.14	.03	−.05	−.02	.15	.00
6. Percent in industry (1920)	.44*	−.01	.50*	.28	.12	.18	.08	.20	.05	.15*
7. Percent in construction (1920)	.25	.00	.14	.07	.10	.19	.07	.20	.02	.20*

* Significant at level < .01 (see note 18).

When controls for the level and type of urbanization are introduced, there is a marked shift in the relative magnitudes of the coefficients. In the two most established urban categories, industrialization works primarily to the advantage of the NSA. This is especially true for the administrative cities, where all industrial indicators are strongly positive for the moderates and very low or negative for the radicals. It is especially interesting to see that moderate strength in both urban categories *is not* related to the crafts but *is* related to the percent in construction and large-scale industry in general.

The picture changes dramatically when we look at the urbanizing, urban-rural, and rural groupings. In general, it is the radicals who are favored by industrial factors in all three types of commune, with construction workers as a consistently strong measure, especially in the most rural areas. In rural communes with small urban agglomerations, it is the two measures of large-scale industry (workers and horsepower per factory) which are most discriminative in a radical direction. The only clear element of support for the moderates is the percent in crafts in the newly urbanized and rural areas.

The urban categories thus provide a much more detailed picture of the industrialization-socialism relationship. It must be remembered, however, that these measures are all static, cross-sectional indicators and that, although they seem to provide support for the Bull proposition, they do not reach directly to the core element of change.

Industrial Change

The *pace* and *timing* of industrialization are the two key factors stressed by all the authors who have relied on and supported the Bull-Galenson hypothesis. The timing aspect involves a complicated treatment of the problem of relativity, i.e. the relationship between diverse and generally incongruous social forms such as industrialism and 'traditional' rural culture. Some of these effects seem to be at work in the rural categories analyzed above, and others will be marginally introduced below. But first I would like to concentrate solely on the question of change, in an attempt to determine just how much of the radical/moderate ecological variance can be attributed to the industrial spurt of 1905–1915.

Björnset tried to measure the effects of change on the 1921 election, but his results were relatively inconclusive. Most of his subanalyses pointed to a slight negative relationship between the moderates and increases in industrial populations, but the radical picture was somewhat more confused. Some indicators showed radical strength with *both* increasing and declining populations, while others pointed in the direction of a stronger positive relationship, especially if the level of industrialization in 1910 was controlled for. I made the point, however, that many of Björnset's results were quite possibly affected by the indicator chosen, the time period, and the rate of change employed. All three problems can be eliminated by using an indicator which exactly spans the significant industrial spurt between 1905–1915 and by employing a rate of change which seems to be *relatively* problem-free.

This has been done for the results presented in Table VI. The official statistics allow for measurement of levels of industrial activity in terms of work-years for 1905 and 1915, and thus for the computation of the 'deviant' rate of change for the industrial surge which took place during this decade. The deviant rate of change has been described by Duncan, Cuzzort and Duncan as the only measure which fully takes into account the level of the indicator at the beginning of the period, thus reducing the potential 'ceiling effect'.[19] The rate is based on the residual from the interannual regression line and is defined as follows:

where
$$D_y = Y_2 - \hat{Y}_2$$
$$\hat{Y}_2 = a_{y_2 y_1} + b_{y_2 y_1} Y_1.$$

In other words, the rate measures the deviance of the actual value of an indicator at Y_2 from its predicted value, based on the general linear tendency in the pooled set of indicators. For the data in Table VI, separate interannual regressions have been run for each urban grouping. I have also presented the cross-sectional correlations for each time-cut as a further expression of change in the static states of the system.

As for the work-years indicator, it seems preferable to the other industrial measures both because it is available at the critical time-cuts and because it is a much more direct measure of *actual* industrial activity than, for example, the proportion of the population who list their *primary* occupation as industrial on the national

census form. Between 1905 and 1915 the number of work-years increased from 110,000 to 201,000, an increase of 82 percent, while for 1900 and 1920 the industrial population increased by only 66,000, a change of approximately 26 percent.[20] (Relative to the increase in the total population this latter change was less than 1 percent.)

Still, when we look at the correlations for the entire country in Table VI, it is apparent that the work-years indicator does not give results significantly different from Björnset's. Björnset found correlations of −.08 and +.08 respectively for the relationship between moderate/radical vote and changes in the industrial population between 1910 and 1920, whereas here the coefficients are −.09 and +.05. Once again the tendencies are in the expected directions, but the sizes of the coefficients are quite small.

In the urban areas the NSA showed strength in stagnating or steeply declining industrial areas, while the DNA had insignificant correlations for both the synchronic and diachronic dimensions. It is the urbanizing category which once again shows dramatic differences between the two parties. There is an almost exact reversal in both magnitude and direction in the cross-sectional relationships, and the difference in the deviant change coefficients is the largest of the entire Table and the only significant figure for this indicator.

Both the urban-rural and rural groupings show figures which deviate from expected patterns. In the former, it is the NSA which has the stronger change coefficient, and in the latter the relationship for the DNA is considerably less than expected. The cross-sectional correlations actually decline here, indicating radical strength in industrial areas but *not* in newly industrialized areas. It should be remembered, however, that any industry located in these areas must be located in urban agglomerations with fewer than 200 *total* inhabitants. Given the relatively high correlation between the DNA and construction workers in these areas it can be assumed that many of the work-years here were in fact in non-urban construction projects.

In sum, it seems that – with the exception of the urbanizing communes, which are striking – there is relatively little support for the postulated relationship between radicalism and rapid industrialization. Before generalizing further, however, I would like to look at some additional measures of 'social disruption' to see it there were other dimensions of change possibly not picked up by the work-years measure.

Change and Social Disruption

In Table VII I have presented the deviant rate of industrial change along with a 'control' variable for the level of industrial development in 1900 (industrial workers per capita). In addition, I have employed four measures which, theoretically at least, should touch upon aspects of social disruption. These indicators were the only available measures for this dimension on this level of analysis. They are:

Illegitimates/change: The deviant rate of change between the percent of illegitimate births in 1900 and 1920.

In-migrants/rural: The percent of the 1920 population born *in rural areas* outside the county *(fylke)* within which the commune is located.[21]

In-migrants/urban: The percent of the 1920 population born *in urban areas* outside the county within which the commune is located.

Percent aliens: The percent of the population born outside Norway as of 1920.

The latter three indicators are relatively straightforward and should not present too many problems for most. I see them all as indirect measures of a general state of 'uprootedness'.[22] The use of illegitimate births, however, will probably surprise some. My major justification here is expediency (since it was the only measure available on the communal basis), but my *rationalization* is to the effect that births out of wedlock are a phenomenon strongly affected by the normative social fabric and that if this fabric is disrupted (by, for example, industrialization) we could expect systematic variation in the indicator. I am well aware that patterns of legitimacy vary according to urban-rural factors, but since we are here controlling for the degree of urbanization, and since interest is focused only on *change* in the rates, I do not see these problems as excessively prohibitive.[23] Illegitimacy, in this sense, does not seem any more problematical than more common anomie measures such as suicide or divorce.

The results from Table VII are most interesting. Both radical and moderate support for the entire country seems to have been based on a relatively high level of industrialization as early as 1900. Since this antedates the hydroelectric breakthrough by about five years, we can say that Bull receives little support here as far as electoral radicalism is concerned. On the national basis, both the NSA and the DNA were strong in previously industrialized areas *and* the changes in these levels of industrialization had only the slightest of effects in the posited directions.

There were, however, marked differences on the question of social disruption. The radicals were stronger in areas where the number of extramarital births increased and where there was a large proportion of in-migrants, especially from rural areas. The moderates show little relationship to the births indicator, a weaker connection with rural in-migrants, and an equally strong relationship with urban-born migrants. The fourth 'disruption' indicator is discriminative only for the moderates, showing a relatively strong relationship between the percent of foreign-born and a moderate socialist ideology.

Once again, however, the control categories show that these relationships are heavily dependent on the degree of urbanization.

If we proceed indicator by indicator, we see that the level of industrialization in 1900 was a differential support factor in only the most- and the least-urbanized categories *and* that the relationship was reversed for the two parties. The radicals were strong in areas which industrialized early in the countryside but not in the city; the situation was reversed for the moderates. The increase in illegitimate

Table VI. Industrial Development and Socialist Vote, 1921

Indicator	Total country		Cities		Other urban		Urbanizing		Urban-rural		Rural	
	NSA (555)	DNA (589)	NSA (59)	DNA (60)	NSA (69)	DNA (70)	NSA (69)	DNA (73)	NSA (82)	DNA (89)	NSA (276)	DNA (297)
Work-years (1905)	.31*	.15*	.23	.07	.45*	.11	.28	−.06	.15	.18	.12	.27*
Work-years (1915)	.23*	.15*	.22	.09	.28	.13	−.05	.29*	.20	.18	.05	.22*
Deviant-change (1905–1915)	−.09	.05	−.01	.09	−.23	.02	−.08	.30*	.14	.07	−.02	.07

* p < .01.

Table VII. Factors of Socioeconomic Change and Socialist Vote, 1921

Indicator	Total country		Cities		Other urban		Urbanizing		Urban-rural		Rural	
	NSA (555)	DNA (589)	NSA (59)	DNA (60)	NSA (69)	DNA (70)	NSA (69)	DNA (73)	NSA (82)	DNA (89)	NSA (276)	DNA (297)
Workers/capita (1900)	.32*	.29*	.31*	.04	.46*	.31*	.21*	.19	.21	.33*	.01	.27*
Work-years/change	−.09	.05	.00	.10	−.23	.02	−.08	.30*	.14	.07	−.02	.07
Illegitimates/change	.06	.20*	.10	.08	−.06	.24	.09	.11	.13	.17	−.01	.22*
In-migrants/rural	.11	.27*	−.07	.31*	−.23	.39*	−.01	.24	.16	.17	.10	.04
In-migrants/urban	.17*	.18*	.01	.05	−.06	.15	.03	.08	.12	−.05	.14	.00
Percent aliens	.22*	.06	.30	−.22	.47*	−.12	.37*	−.07	−.08	.01	.10	.01

* p < .01.

children was discriminative in only two categories (other urban and rural), both in favor of the radicals. In neither case, however, did these increases seem to be related to industrialization. (The zero-order correlations between industrial change and increase in illegitimate births in these two categories were both –.03.)

The percentage of rural-born in-migrants proves to be particularly effective as a predictor of radicalism in urban and urbanizing areas, but not so in rural areas. The same tendency also holds for urban-born in-migrants but here the coefficients are much less dramatic. It is interesting to note, however, that the largest single correlation for the NSA is for urban-born migrants to *rural* areas, a rather special category of mobility.

Finally, it is obvious that the percent of aliens was strongly related to the moderate vote. The radicals have only negative or nonexistent correlations here as opposed to relatively high positive figures for the moderates in four of the five categories.

5. Summary and Conclusions

In order to provide a more 'synthetic' summary and to control for the intercorrelation of indicators, I have run separate multiple regression analyses on the data from Tables V and VII. The three major predictors from each of these analyses and the cumulative multiple correlation coefficients (R^2) are presented in Table VIII according to the five urbanization categories. There are no indicators which appear in both analyses, so there is no part of the explained variance which is *directly* common for the two sets of predictors. The goal of the exercise was not to predict as much of the variance as possible, however, but rather to see which indicators were most effective *within the specified theoretical realms*.

Urbanized Communes. The moderate Social Democrats were clearly much stronger than the radicals in urban industrial areas. Nearly all NSA indicators for both urban categories are 'solid' industrial measures, and the amounts of explained variance are considerable for all four analyses. In addition, the moderates had nearly 70 percent of their total vote in these areal units. Unexpectedly, the percent of aliens was a strong support factor for the NSA.

The combined effect of the two sets of indicators was much less for the radicals, indicating that industrialism was not the primary basis for their 56 percent of the vote here. The industrial indicators explain a meager 4.8 percent of the variance in the cities, and two of the factors are negative. Otherwise, it is clear that the proportion of rural in-migrants and the proportion of aliens were respectively strong positive and strong negative contextual factors, and that there was a slight contribution from the measure of normative disruption. This configuration (plus the absence of the industrial change indicator) seems to indicate that these areas were possibly *urbanizing* but not necessarily *industrializing*. (The categories of administrative cities and other urban areas do not take into account changes in

Table VIII. Major Ecological Predictors of Socialist Votes in 1921, Indicators of Industrialism and Socioeconomic Change*

Urbanization category	Percent of party's national vote		NSA		DNA	
	NSA	DNA	Major predictors	Cumulative R²	Major predictors	Cumulative R²
A. Urbanized communes						
Cities	42.0	29.4	1. Workers/capita (1910): +	.282	1. Percent in crafts: −	.035
			HP/factory (1915): +	.392	Workers/capita (1910): +	.042
			Percent in industry (1920): +	.436	Percent in industry (1920): −	.048
			2. Workers/capita (1900): +	.093	2. In-migrants/rural: +	.094
			Percent aliens (1920): +	.196	Percent aliens (1920): −	.140
			Work-years/change: +	.204	Illegitimates/change: +	.168
Other urban	27.5	26.5	1. Percent in industry (1920): +	.249	1. Workers/capita (1910): +	.099
			Workers/factory (1910): +	.273	HP/factory (1915): +	.139
			Percent in construction (1920): +	.279	Workers/factory (1910): +	.165
			2. Percent aliens (1920): +	.224	2. In-migrants/rural: +	.154
			In-migrants/rural: −	.364	Percent aliens (1920): −	.213
			Workers/capita (1900): +	.485	Workers/capita (1900): +	.292

B. Urbanizing communes

Urbanizing 11.0

1. Percent in crafts (1920): +	.021
Work-years (1915): −	.031
Workers/capita (1910): +	.046
2. Percent aliens (1920): +	.136
Work-years/change: −	.158
Illegitimates/change: +	.171

15.3

1. Workers/capita (1910): +	.134
Percent in construction (1920): +	.162
Percent in crafts (1920): −	.180
2. Work-years/change: +	.090
Workers/capita (1900): +	.129
Percent aliens (1920): −	.169

C. Primarily rural communes

Urban-rural 6.6

1. Work-years (1915): +	.040
Percent in crafts (1920): −	.049
Percent in construction (1920): +	.057
2. Workers/capita (1900): +	.043
Illegitimates/change: +	.068
Work-years/change: +	.087

10.2

1. Workers/factory (1910): +	.162
Percent in construction (1920): +	.196
Workers/capita (1910): +	.231
2. Workers/capita (1900): +	.106
Illegitimates/change: +	.152
In-migrants/urban: −	.168

Rural 12.9

1. Percent in crafts (1920): +	.024
Workers/capita (1910): +	.032
Workers/factory (1910): −	.036
2. In-migrants/urban: +	.020
Percent aliens (1920): +	.022
Work-years/change: −	.024

18.6

1. Work-years (1915): +	.047
Percent in construction (1920): +	.079
Workers/capita (1910): +	.087
2. Workers/capita (1900): +	.075
Illegitimates/change: +	.130
In-migrant/rural: −	.137

* Separate multiple regression analyses have been run for all three sections (A, B, and C). Predictors 1 show industrialization (Table V); predictors 2 show socioeconomic change (Table VII).

urban population between 1900 and 1920. Further studies will have to try to control for these changes.)

Urbanizing Communes. In newly urbanized areas, the moderates were stronger in communes with high percentages of both craftsmen and aliens, but the contribution of the former was extremely slight. There was a lack of heavy industry and industrial activity actually declined. The latter may possibly have contributed to the slight positive effect from the rise in illegitimate births.

The radicals showed strength in industrializing areas and areas with a large number of construction workers. The proportion of the work force in crafts and the number of aliens were apparently moderating influences. It is important to note, however, that the second most powerful contributor among the socioeconomic indicators is the control variable for the level of industrialization in 1900. It would seem, therefore, that Myklebost's lower level of 200 in urban agglomerations does not exclude the possibility of some industrial activity prior to the major surge of 1905–1915 in this grouping. In one sense this takes the sharp edge off the rural/ industrial conflict as expressed by the indicators used here, but it does not serve to alter the fact that these communes were *primarily* rural as of 1900.

Primarily Rural Communes. In the grouping of urban-rural communes, where the NSA had only 6.6 percent of its total vote, there is a complete reversal in the pattern for the moderates. The explained variance is very low, but the indicator configuration is one which we might have ideally predicted for the radicals. Percent in crafts is low; percent in construction is high; industrial activity is increasing; and there seems to be norm disruption. The radicals show a similar pattern (minus the work-years increase) but the combined effect of the indicators is much greater. It thus appears as though both socialist alternatives derived support from small urban-industrial pockets in rural settings, but the effect was stronger in a radical direction.

In the large rural grouping the discriminative power of the indicators once more emerges, even though the amounts of explained variance are quite low. (The larger sample size must be taken into account however. The ratios of explained variance for the radicals here are on a significance level comparable to those of the moderates in the more urbanized categories.) The NSA was strong in rural communes with large numbers of urban-born in-migrants, aliens, and craftsmen. The little industrial activity which did exist was light and declining. All indicators seem to point in the direction of small guild-centered handicraft operations, which were probably declining in importance during a gradual shift to heavier industry.

The radical support was apparently related to this shift, at least in terms of new construction. It seems most likely that both the work-years indicator from 1915 and the workers per capita figure for 1910 are related to construction activity. It also seems likely that the increase in illegitimate births (in this grouping as in the urban-rural grouping) is directly connected with the type of social disruption which Bull associated with the rapid development of hydroelectric power in the countryside.

The data from the ecological analysis thus seem to permit some of the following conclusions in relation to the Bull-Galenson hypothesis.

1. The *intensity* of industrialization was not as important a factor as the original theorists imagined. Both Björnset's measure of change and the more accurate deviant rate show little discriminative power for the total sample of units. In the breakdown for urbanization, the change measure appears in only one of the radical categories (urbanizing communes) and four of the moderate groupings (twice positive and twice negative). Its greatest contribution is to the radicals in the urbanizing areas, and it is probable that it was the highly salient units in this group which prompted Bull's original generalization. It was pointed out, however, that this grouping accounted for only 15.3 percent of the total DNA vote.

2. Radicals were somewhat stronger in urban areas where in-migration from rural regions was high and where there was some evidence of norm disruption. Industry in these areas was apparently small but 'power intensive', with low worker ratios and high power ratios. (Excluding the electric power applied to smelting and electolytic processes.[24]) Industrial *change* was not a factor, however, indicating a certain autonomous effect from the urbanization itself or, perhaps more correctly, an effect due to the incongruence of rural and urban-industrial life styles.

3. In the countryside, radicalism was most strongly related to construction activity and a seemingly related norm disruption. Both results strongly confirm Bull's emphasis on the radicalizing effects of construction workers in rural settings. (The construction indicator was the second most powerful predictor in the urbanizing, urban-rural, and rural categories, and the beta weights for each grouping were all of similar magnitudes: .20, .24, and .18.) But, it was noted that moderate strength was also related to a similar configuration in the urban-rural grouping, *and* with a positive contribution from the industrial change indicator. Despite the relatively small percentage of variance explained here, such results should serve to check enthusiasm in proclaiming Bull's proposition as totally confirmed and should stimulate the search for mitigating circumstances on both the ecological and other levels of analysis.

4. The percent of the work force in handicrafts proved to be a slightly moderating influence, primarily in the rural and newly urbanized areas. It was somewhat ambiguous, however, since the moderates show a negative coefficient here, in the urban-rural group. Perhaps what is most important, however, is the fact that it was the percent in crafts which was the major moderate predictor in just those areas where the radical support was most closely connected with new industries or construction. Seemingly it was in these areas of social disruption that the moderating influences of the guild tradition (predicted by Galenson) had their greatest effect.

5. The proportion of aliens proved to be a consistently positive measure of support for the moderates and an equally consistent negative measure for the radicals. My reasons for including this indicator (which was not mentioned directly by Bull) were based on exact opposite expectations. Thinking of the American labor move-

ment (where immigrants played such a large role in the most radical groups[25]); and of the study by Rydenfelt of communism in Sweden (where foreign workers were also a radicalizing factor[26]) and the general implications of the disruption/ anomie theory, I anticipated similar effects for aliens in Norway. The results in the opposite direction disprove these ideas, but they do not offer an immediate alternative explanation for the relationship to moderate socialism. I would antic-ipate, however, that the composition of the alien population (largely Swedish) and the regional location of alien-strong communes are vital elements to consider.

6. Finally, it can be said in further support of Bull that moderate socialism was strongly related to established urban industrial areas – areas, moreover, in which a rural-born labor force played absolutely no role. The established urban prole-tariat, in other words, seemed to form an extremely fruitful electoral basis for the party of Bernsteinian social democracy.

In sum, the limited ecological analysis conducted here seems to provide general, and in some cases strong support for the multifaceted Bull proposition. It also shows, however, that the supporting factors are uneven in their explanatory weight and far from consistent in the picture they present. It will be the task of further analysis to try to supplement these weightings and to make the picture more con-sistent through the introduction of additional indicators of social and ecological structure and, eventually, alternative theoretical frameworks. Edvard Bull seems to have clearly grasped the essence of the radicalization process. It is an open question, however, as to whether or not there were perhaps other essences which were somewhat less salient to the politically active Marxist professor.

NOTES

1. Edvard Bull, Sr., *Den Skandinaviske Arbeiderbevegelse 1914–1920*, Kristiania: Det Nor-ske Arbeiderparti, 1922. For a German version, see Edvard Bull, 'Die Entwicklung der Arbeiterbewegung in den drei skandinavischen Ländern', in *Archiv für die Geschichte des Sozialismus und der Arbeiterbewegung 10* (1922).
2. Stein Rokkan and Henry Valen, 'Parties, Elections and Political Behaviour in the North-ern Countries', in Otto Stammer (ed.), *Politische Forschung*, Köln und Opladen: West-deutscher Verlag, 1960, pp. 103–250.
3. See especially Walter Galenson, 'Scandinavia', in Walter Galenson (ed.), *Comparative Labor Movements*, New York: Prentice-Hall, 1952.
4. See W. M. Lafferty, *Economic Development and the Response of Labor in Scandinavia: A Multi-Level Analysis*, Oslo: Universitetsforlaget, 1971.
5. Mancur Olson, Jr., 'Rapid Growth as a Destabilizing Force', *The Journal of Economic History 23*, 4 (1963), pp. 529–552.
6. Val R. Lorwin, 'Working-Class Politics and Economic Development in Western Europe', *American Historical Review 63* (1958), pp. 338–351.
7. Leon D. Epstein, *Political Parties in Western Democracies*, New York: Praeger, 1967.
8. William Kornhauser, *The Politics of Mass Society*, New York: The Free Press, 1959.
9. Seymour Martin Lipset, *Political Man*, New York: Doubleday Anchor Books, 1963.

10. Lipset, *op.cit.*, p. 54.
11. See Aksel Zachariassen, *Fra Marcus Thrane til Martin Tranmæl*, Oslo: Arbeidernes Opplysningsforbund, 1962.
12. Asbjörn Björnset, *Sammenheng mellom Industrialiseringstempo og Radikalisering?*, Hovudfagsoppgåve i historie, Bergen: Universitetet i Bergen, 1968 (mimeo), p. 60.
13. See Lafferty, *op.cit.*, Chapter 2, and Norwegian Central Bureau of Statistics, *Økonomisk Utsyn*, 1900–1950, *Samfunnsøkonomiske Studier 3*, pp. 194–201.
14. See Otis Dudley Duncan, Ray P. Cuzzort and Beverly Duncan, *Statistical Geography*, Glencoe, Ill.: The Free Press, 1961, pp. 160–174.
15. See Erik Allardt, 'Implications of Within-Nation Variations and Regional Imbalances for Cross-National Research', in Richard L. Merritt and Stein Rokkan (eds.), *Comparing Nations*, New Haven and London: Yale University Press, 1966, pp. 337–348.
16. See Kevin R. Cox, 'On the Utility and Definition of Regions in Comparative Political Sociology', *Comparative Political Studies 2* (1969), pp. 68–98.
17. Hallstein Myklebost, 'Norges Tettbygde Steder', *Ad Novas 4* (Skrifter fra Det norske Geografiske Selskab), Oslo: Universitetsforlaget, 1960. I am extremely thankful to Professor Myklebost for making his data available to me. It is, without a doubt, one of the most exact sets of urbanization data for any country in the world.
18. My use of significance tests in this study is primarily for the sake of 'semantic' not 'scientific' meaningfulness. They are not used in the sense of hypothesis testing from a sample to a larger universe, but rather as a convenient shorthand for expressing the problem of varying group sizes. See Gideon Sjoberg and Roger Nett, *A Methodology for Social Research*, New York: Harper & Row, 1968, pp. 280–284.
19. Duncan, Cuzzort and Duncan, *op.cit.*, p. 163.
20. Norwegian Central Bureau of Statistics, *Industristatistik 1915*, NOS VI, 125, 1917, p. 4; and *Statistiske Oversikter 1948*, NOS X, 178, 1949, Table 11, pp. 34–35.
21. The in-migrant data is not available in consistent categories for 1900, 1910, and 1920, so that rates of change for the entire set of units were not possible. I have chosen (and combined) the two categories from 1920 which classify people as to whether they were born outside the county *(fylke)* according to rural and urban areas. This means that these aggregates had to at least cross a county border in their moves. It does not mean, however, that this mobility was necessarily connected with the industrial surge of 1905–1915, since there is no way of knowing when a respondent entered the commune.
22. The works of Olson and Kornhauser cited above are good examples of the 'uprootedness' theory.
23. See 'Non-Wedlock Situations in Norway', Chapter XII in Thomas D. Eliot *et al.*, *Norway's Families*, Philadelphia: University of Pennsylvania Press, 1960, pp. 240–280.
24. The amount of horsepower applied to smelting and electrolytic processes was given separately in the statistics for 1915. In one sense, these figures are extremely important since it was this type of applied electric power which was the basis of the new electrochemical industries. It was these industries which were the leading sector for the industrial breakthrough. There were only 27 cities or communes where these processes were important enough to provide figures for this category. The range was from 2 HP up to 170,000 HP for the huge A/S Rjukan Salpeterverk in Tinn commune, Telemark. The average was approximately 13,500 H.P.

   The *overall* effect of these new industrial operations does not seem to have been an important radicalizing factor. Rank order correlations for the two parties in 1921, and the amount of power applied to these processes in the 20 most power-intensive communes in 1915, give the following results: NSA +.29, DNA +.36. In terms of electoral support, these heavy-industry areas contributed 11.6 percent of the total NSA vote, as compared to 8.0 percent for the DNA.
25. See Neil McInnes, 'The Labor Movement; Socialists, Communists, Trade Unions', in *The Impact of the Russian Revolution, 1917–1967*. Issued under the auspices of the Royal Institute of International Affairs, London: Oxford University Press, 1967; and P. A. Sorokin, 'Leaders of Labor and Radical Movements in the United States and Foreign Countries', *American Journal of Sociology 33* (1927), pp. 382–411.
26. Sven Rydenfelt, *Kommunismen i Sverige: En samhällsvetenskaplig Studie*, Lund: Gleerupska Universitetsbokhandeln, 1954, p. 267.