Industrial growth in Montana
by James B Cameron

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY in Agricultural Economics
Montana State University
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Abstract:
An examination of the Montana economy reveals that the leading indicator of economic growth, per capita income, is increasing but at a rate below that found in the majority of states. The Montana economy needs an infusion to reverse this trend. Industrial growth is a sector that could give this infusion and stimulate economic growth. The research was directed at assessing the possibility of stimulating industrial growth in Montana.

The methodology used in the research was (1) to review location theory and then apply it to the characteristics found in Montana to determine if enough favorable location factors existed that would induce industry to locate in the State and (2) to make empirical studies among three different groups of industrial firms (firms now operating in Montana, firms that have operated within Montana, and out-of-state firms that have investigated industrial locations within Montana) to determine if additional locational problems existed that were not discovered in applying location theory to Montana. In addition, a sample of the Montana population was interviewed to determine the attitude of the population toward industrial growth.

From applying location theory and from the empirical studies, the indications were that Montana is not on the threshold of industrial development nor were there ary indications that it is likely to be so in the near future. Some industrial growth should occur but it is not expected that this growth will be large.

The biggest stimulant to future industrial development in Montana will be in the processing of the State's natural and agricultural resources.

The biggest deterrent to industrial growth is the lack of markets, with cost of transportation and labor being other important deterrents.

The attitudes among those Montanans interviewed for this study indicated they were overwhelmingly in favor of trying to stimulate industrial growth and were willing to offer some concessions to industry in order to stimulate this growth.

Considering all factors relating to the industrial sector, it is unlikely that this area will grow substantially so as to stimulate any large growth in the Montana economy.

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A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Agricultural Economics

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Notwithstanding the contributions made by others, the errors, if any, in this dissertation are mine alone and I assume full responsibility for any that exist.

CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION	1
	Problem Setting	1
	Economic Growth	3
	Per Capita Income	6
	Population	7
	Employment	14
	Brain Drain	21
	Purpose and Importance of Study	26
	Hypothesis	29
	Methodology	30
	Limitations	32
II.	GENERAL FACTORS INVOLVED IN THE LOCATION OF INDUSTRY	33
	Introduction	33
	Demand Factors	35
	Cost Factors	41
	Personal Factors	67
	Governmental Factors	72
	Summary	73
III.	CHARACTERISTICS OF MONTANA AFFECTING INDUSTRY	74
	Introduction	74
	General Characteristics	74

CHAPTER PAGE

Natural Resources 76

Labor 83

Transportation 88

Industrial 89

Taxes 96

Community Government 98

State Government 99

IV. DETERRENTS AND STIMULANTS TO INDUSTRIAL GROWTH 102

Introduction 102

Present Montana Industry 102

Demand 105

Cost Factors 110

Personal Factors 148

Governmental Factors 155

Summary 156

V. EMPIRICAL STUDIES 158

Firms Operating Within Montana 158

Firms Investigating Montana Locations 187

Firms No Longer Operating in Montana 194

Summary 195

VI. ATTITUDES TOWARD INDUSTRY 197

Importance of Attitude 197

Results of Questionnaire 198

CHAPTER PAGE

Chi-Square Test for Homogeneity 213

Summary 214

VII. SUMMARY, CONCLUSION, AND RECOMMENDATIONS 216

Summary 216

Conclusion 220

Recommendations 223

APPENDIX 228

Appendix I 229

Appendix II 233

Appendix III 234

Appendix IV 235

LITERATURE CONSULTED 237

LIST OF TABLES

TABLE		PAGE
I.	Per Capita Income, Montana and the United States, 1950-1965	8
II.	Per Capita Income Indexes for Montana, Neighboring States, and the United States, 1955-1965	9
III.	Percentage Change in Per Capita Incomes, Montana and Surrounding States, 1953-1964 and 1948-1964	10
IV.	Montana and United States Population Comparisons, April 1, 1960 and July 1, 1964	12
V.	Employment Changes in Montana by Major Divisions From 1950 to 1960 and Projected to 1975	15
VI.	Average Employee Earnings in Montana by Divisions, 1960 and 1965	20
VII.	Percentage of Employment by Division, Montana and the United States, April 1, 1960	22
VIII.	Employment Location of 216 Graduating Seniors of Montana State University, June 1966	24
IX.	Selected Statistical Characteristics, by State	77
X.	Occupational Distribution of the Labor Force, Montana and United States, 1950 and 1960	84
XI.	Age Distribution and Percentage Employed of the Montana Labor Force, 1960	85
XII.	Characteristics of Civilian Labor Force in Montana, 1960	86
XIII.	General Statistics for Standard Metropolitan Statistical Areas, Counties, and Selected Cities in Montana, 1963 and 1958	92
XIV.	General Statistics by Industry Group in Montana, 1963 and 1958	93

TABLE		PAGE
XV.	Size of Manufacturing Establishments in Montana by Number of Employees, 1958 and 1963	104
XVI.	Index by State of Relative Growth in Value Added and Production Employment	114
XVII.	Percentage Comparison of Per Hour Earnings for Production Workers Between Montana and Other Continental States, Selected Industrial Groups and All Industry, 1963	121
XVIII.	Montana's Ranking of Hourly Earnings for Production Workers with Other Continental States, All Industry and For Selected Industrial Groups, 1963 and 1958	122
XIX.	Comparison of Productivity Between Montana and Other Continental States for Selected Industrial Groups, 1963	124
XX.	Productivity Ranking of Montana with Other Continental States for Selected Industrial Groups, 1963	125
XXI.	Labor, Material, and Utilities as a Percentage of Total Value of Shipments by Industry Group, 1963	128
XXII.	Four Digit Industry Groups with Utility Costs Exceeding Five Percent of Total Value of Shipments, 1963	130
XXIII.	Tax Comparisons Between Montana and the Eight States That Showed the Largest Increase in Value Added to Manufactures in the Period 1947 to 1963	135
XXIV.	Percentage of Returns on Industry Questionnaire	160
XXV.	Summary of Responses on "Attitude Toward Industry" Questionnaire	199
XXVI.	Responses on 633 Non-Student "Attitude Toward Industry" Questionnaire by Age and Sex	209
XXVII.	Responses on 633 Non-Student "Attitude Toward Industry" Questionnaires by Occupation	212
XXVIII.	Chi-Square Test of Homogeneity on Question 1 of "Attitude Toward Industry" Questionnaire	214

LIST OF FIGURES

FIGURE		PAGE
1.	Unemployment Rate, Montana and United States, January 1, 1960 to July 1, 1966	17
2.	Cost Curves - Two Competitors	42
3.	Transportation Cost	46
4.	Backhaul Transportation	50
5.	Average Annual Precipitation in Montana	78
6.	Railroads	89
7.	Airline Routes	90
8.	Maintained Highways	91

ABSTRACT

An examination of the Montana economy reveals that the leading indicator of economic growth, per capita income, is increasing but at a rate below that found in the majority of states. The Montana economy needs an infusion to reverse this trend. Industrial growth is a sector that could give this infusion and stimulate economic growth. The research was directed at assessing the possibility of stimulating industrial growth in Montana.

The methodology used in the research was (1) to review location theory and then apply it to the characteristics found in Montana to determine if enough favorable location factors existed that would induce industry to locate in the State and (2) to make empirical studies among three different groups of industrial firms (firms now operating in Montana, firms that have operated within Montana, and out-of-state firms that have investigated industrial locations within Montana) to determine if additional locational problems existed that were not discovered in applying location theory to Montana. In addition, a sample of the Montana population was interviewed to determine the attitude of the population toward industrial growth.

From applying location theory and from the empirical studies, the indications were that Montana is not on the threshold of industrial development nor were there any indications that it is likely to be so in the near future. Some industrial growth should occur but it is not expected that this growth will be large.

The biggest stimulant to future industrial development in Montana will be in the processing of the State's natural and agricultural resources. The biggest deterrent to industrial growth is the lack of markets, with cost of transportation and labor being other important deterrents.

The attitudes among those Montanans interviewed for this study indicated they were overwhelmingly in favor of trying to stimulate industrial growth and were willing to offer some concessions to industry in order to stimulate this growth.

Considering all factors relating to the industrial sector, it is unlikely that this area will grow substantially so as to stimulate any large growth in the Montana economy.

Industrialization appears to be a major and essential ingredient for substantial economic growth.
Wilbert E. Moore

Chapter I

INTRODUCTION

Problem Setting

In eleventh century Europe a group of churchmen hit upon an idea to enhance the value of church lands. Cities and towns had begun to develop so these churchmen conceived the idea of industrial development that would promote the church owned lands and make them more valuable. In twentieth century United States some of the prople are still doing the same thing--trying to enhance the wealth of an area through industrial development. But the means being used now are vastly different and far more expensive than those used by the eleventh century churchmen. In fact, trying to lure new industries[1] to establish in particular locations has become a business that employs thousands of people and spends millions of dollars.

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[1] Although there are several good definitions of industry available, the one selected was that used by Wilbert E. Moore, in The Impact of Industry, Prentice-Hall, 1965, page 4. Moore defined industry as "the fabrication of raw materials into intermediate components or finished products by primarily mechanical means dependent upon inanimate sources of power."

Even though the above definition is narrower than some others (especially that used by the federal government which includes not only industry, as defined above, but also construction, transportation, mineral extraction, and public utilities), it fits the subject matter discussed in this paper. As defined, industry is closely synonomous with manufacturing and the two are used interchangeably throughout this study.

As recently as 1963 it was estimated that this business was spending $220 million a year.[2]

No longer is this a business where amateurs can have much success as there are too many professionals who have a greater knowledge of how the game is played. It has been estimated that there are 20,000 area development organizations throughout the United States[3] and that about 500 new plants are either established or relocated in any given year.[4] Thus the chance of success in landing one of these industrial plants by an area development organization is very small--about one in forty.

With such heavy odds against landing one of the new industrial plants, why don't some of these industrial development groups close up shop and forget the whole thing? The reason is simple--the potential gains exceed current costs. For example, a study done by the Economic Research Department of the Chamber of Commerce of the United States indicated the following: A new plant employing 100 workers would add 65 jobs outside the plant; it would support three more retail stores; it would boost bank deposits in the area by $229 thousand; it would increase population by 359 people; it would add 100 more households, 97 more cars, and 91 more school children; it would add $331 thousand to retail sales per year; and it would increase

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[2] "The Rough-and-Tumble of Site Location," Dun's Review and Modern Industry, March, 1963, p. 97.

[3] "The Big Plant Site Scramble," Dun's Review and Modern Industry, March, 1964, p.105.

[4] James O. Henderson and Anne O. Krueger, National Growth and Economic Change in the Upper Midwest, University of Minnesota Press, 1965, p.110.

personal income by $710 thousand.[5] In addition another writer estimated that, on an average, industry makes a capital investment of $20 thousand for each employee hired.[6] One must keep in mind that these figures were derived several years ago and undoubtedly would be higher today. Yet they are impressive and give a good indication why the race for industry is on. Also, there is little doubt that industrialization will help economic growth and improve per capita income.

Economic Growth

Economic growth has been defined as the expansion of an area's capability to produce the goods and services that its people want. Since the productive capacity of an area depends upon the quantity and quality of its resources and the level of technology present, economic growth requires that these determinants be continually improved and expanded.

What is the significance of economic growth for the people of Montana? Essentially it is to increase the welfare or well-being of the people in the State absolutely as well as relatively to the other forty-nine states. This is done in two ways: it leads to growth in the quantity and quality of goods available for private consumption, and it provides the necessary resources for government to assume its ever-increasing responsibilities without adversely affecting private consumption standards. If economic

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[5] "What New Industrial Jobs Mean to a Community," Chamber of Commerce of the United States, Washington, D.C., 1963.

[6] "Want New Industry," American City, April, 1959, p. 5.

growth did not occur in the total economy, then an expanding government could, in some instances, lead to lower personal consumption.

Although the material standard of living in this nation is the highest in the world, the citizens of Montana, like those in the rest of the country, have come to expect a continued upward movement. For this increase to take place, economic growth is an absolute necessity. That economic growth has occurred in the United States cannot be questioned, but neither can the statement that economic growth throughout the United States has not occurred uniformly. A competitive struggle exists among the states, each hoping to obtain more than its share of this economic growth. (An analysis of whether or not Montana has obtained its share of the economic growth that has occurred in the United States will be discussed later in this chapter.)

The processes by which economic growth takes place are the means by which an area expands its productive capacity. Basically, four factors are important in the process of economic growth. These are: (1) the quantity and quality of labor (including managerial abilities), (2) the quantity and quality of the natural resources, (3) the quantity and quality of capital, and (4) the level of technology within the society.

As for factors three and four, capital and technology, their importance as factors in the economic and industrial growth of Montana (or of any other state for that matter) have been assumed to be negligible. Most experts would agree that within the United States (and to some extent all of the free world) capital is now quite mobile. That is, it moves in

response to the opportunities and earnings from its employment. The United States system of financial institutions is highly developed and these institutions are continually searching for new ways to improve their services.

As for technology, this diffuses through our nation at a very rapid rate. Although there are pockets where research activities are more extensive, normally professional associations and literature will move the knowledge of any new technology at a fairly rapid rate. Montana certainly is not a leader in the development of technology and perhaps lags some in the adoption of new ideas. Aside from the national system of patents, there are no legal barriers present to prevent the transfer of innovations from state to state. It is felt that patent protection probably has little affect on the economic growth of Montana.

The other two factors of economic growth, natural resources and labor, are both important to Montana. Natural resource endowment is very definitely not the same in the different states and there is not much a state can do to change the natural resources that it has or does not have. However, something can be done about finding and utilizing those that do exist. In the booklet Natural Resources of Montana, this statement is made:

> "Development of the state (Montana) has stemmed and will progress from the people of Montana, who know the value of wise conservation, careful management, and rational use of the resources Nature has given them. Montana has grown from a brawling, independent frontier territory into a State with a diversified economy. Its future is assured, because the basic resources are at hand for sustaining continued growth."[7]

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[7]Natural Resources of Montana, U. S. Department of the Interior, Washington, D. C., 1964, p.67.

The quality of labor is more important in economic growth than quantity but both are necessary ingredients. India and China have large quantities of unskilled labor yet show a poor economic growth rate. On the other hand, an area may have an abundance of skilled (quality) labor and still show a low economic growth rate. Subsequent pages in the chapter will examine the quantity and quality of labor in Montana along with an assessment of their effect on economic growth.

Per Capita Income

If one is interested in economic growth because of its significance to the welfare of the citizens, then what is important is not just output but rather the right kind of output. Increased production means little to the average citizen unless he has a growing volume of goods and services at his disposal. Thus the measure of economic growth that is most meaningful is the level of output per person. Measured in dollars and cents this is labeled per capita income and is one of the standard methods for determining how well an area is doing.

A look at per capita income for Montana shows that a very undesirable change has taken place in recent years. Taylor studied this area and states that in the period 1938-1955 per capita income in Montana averaged about 1.5 percent above that for the whole United States, but since 1955 it has averaged 7.5 percent below the United States average. Taylor concluded from his study that "Montana is not sharing in the general economic growth of the country" and that "rather than being sluggish, the Montana

economy has been almost stagnant since 1955."[8] Table I shows what is happening to per capita incomes in Montana and the United States, Table II shows the growth in per capita incomes in Montana, surrounding areas, and the United States. Both tables clearly indicate that the relative position of Montana is deteriorating. It is evident that something needs to be done to reverse this undesirable trend.

Table III shows that per capita income growth in Montana has been small compared with surrounding states. In fact, except for South Dakota, Montana had the lowest percentage increase in per capita income of all fifty states during the period 1948 through 1964.

The standard measurement for determining how well an area is doing, per capita income, is far from encouraging as far as Montana is concerned. Not only is growth in per capita income below average but our ranking among the fifty states is deteriorating, going from the top third in the early 1950's to the bottom half in the 1960's

Population

In the decade 1950-1960, the population of Montana grew from 591 thousand to 675 thousand people. This is an average percentage growth for each year of 1.33 percent as compared to the rate of growth of the entire United States of 1.70 percent per year. From April 1, 1960 (when

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[8] Maurice C. Taylor, "Income Trends in Montana," Bulletin 590, Montana Agricultural Experiment Station, Montana State University, Bozeman, Montana, (October, 1964) pp. 3-4.

TABLE I

PER CAPITA INCOME, MONTANA AND THE UNITED STATES, 1950-1965

Year	Montana (Dollars)	United States (Dollars)	Montana as a Percent of U. S. (Percent)	Montana's Rank Among Fifty States (Rank)
1950	1,622	1,496	108	13
51	1,760	1,652	107	17
52	1,786	1,733	103	18
53	1,779	1,804	99	21
54	1,729	1,785	97	22
55	1,852	1,876	99	19
56	1,892	1,975	96	21
57	1,944	2,045	95	21
58	2,059	2,068	100	19
59	2,010	2,161	93	26
60	2,037	2,215	92	27
61	1,973	2,264	87	31
62	2,272	2,368	96	24
63	2,265	2,455	92	28
64	2,255	2,579	87	32
65	2,438	2,746	89	29

SOURCE: Survey of Current Business, U. S. Department of Commerce, Washington, D. C., August, 1966, Table 2, p. 13.

TABLE II

PER CAPITA INCOME INDEXES FOR MONTANA, NEIGHBORING STATES, AND THE UNITED STATES, 1955-1965
(1955=100)

Year	Montana	Idaho	North Dakota	South Dakota	Utah	Wyoming	United States
1955	100	100	100	100	100	100	100
56	102	108	104	105	105	104	105
57	105	112	107	124	110	111	109
58	111	117	123	129	113	115	110
59	109	122	111	114	119	120	115
60	110	120	124	138	121	122	118
61	107	124	109	137	126	124	121
62	123	132	156	155	133	128	126
63	122	133	145	148	136	130	131
64	122	138	144	145	140	131	137
65	132	156	165	171	145	138	146

SOURCE: Computed from data in "Survey of Current Business," U.S. Department of Commerce, Washington, D.C., August, 1966, Table 2, p.13.

TABLE III

PERCENTAGE CHANGE IN PER CAPITA INCOMES, MONTANA AND SURROUNDING STATES, 1953-1964 and 1948-1964

State	1953-1964 (Percent)	1948-1964 (Percent)
Montana	27	41
Idaho	36	58
North Dakota	68	54
South Dakota	38	29
Utah	39	77
Wyoming	29	57

SOURCE: "Survey of Current Business," U.S. Department of Commerce, Washington, D. C., July, 1965, p. 11

the last census was taken) to July 1, 1965, the Census Bureau has estimated that the population of Montana increased by 31 thousand to a total population of 706 thousand. This is a 4.6 percent increase during this 5 year period as compared to an 8 percent increase for the entire United States.

What is the reason for the slow rate of population growth in Montana? One cannot attribute it to the birth rate as this exceeded the United States average, nor to the death rate as Montana's approximated the United States average. One factor does stand out and that is the number of out-migrations that the State experiences. During the 1950's, Montana experienced a net out-migration of approximately 25,000 people. From available information, most of those in this out-migration were in the younger and most productive age group (15 to 25 years of age) and the reason they left was because of better opportunities elsewhere. For example, Rixe and Ewasiuk state that 13 percent of the male out-migration was in the 20 to 24 age group and that 9 percent was in the 15 to 19 age group. They conclude: "These migrants represent a very great loss to the state. They are highly productive young men moving into another state's labor force."[9]

This situation does not seem to have changed since 1960. Table IV shows the composition and changes in the populations of Montana and the United States since 1960. Notice in this table that the 18 to 44 age

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[9]Lloyd Rixe and W. J. Ewasiuk, "Montana's Population," Now, Montana State University, Bozeman, Montana, Winter, 1965, p.4.

TABLE IV

MONTANA AND UNITED STATES POPULATION COMPARISONS,
APRIL 1, 1960 AND JULY 1, 1964

Age Group	Percentage of Total Population (4/1/60)		Percentage of Total Population (7/1/64)		Percentage Change in Population between 4/1/60 to 7/1/64	
	Montana (Percent)	United States (Percent)	Montana (Percent)	United States (Percent)	Montana (Percent)	United States (Percent)
Under 5 yrs.	12.2	11.3	11.6	10.8	-2.4	1.8
5 to 17 yrs.	26.3	24.5	27.8	25.9	10.1	12.9
18 to 44 yrs.	33.2	34.9	32.0	33.9	0.5	3.8
45 to 64 yrs.	18.6	20.1	19.2	20.1	7.9	6.5
65 and Over	9.7	9.2	9.4	9.3	1.1	7.8
Total Population	100.0	100.0	100.0	100.0	4.1	6.7

SOURCE: Bureau of the Census, "Population Estimates," Series P-25, No. 333, March 30, 1966, Tables 1,3, and 4, pp. 6, 8, 9.

group in Montana increased by 0.5 percent although the whole United States increased 3.8 percent. Again Montana is experiencing very little growth in the most productive age group. Rixe and Ewasiuk drew the following conclusions from such trends:

> "Present migration and population growth patterns in Montana do not offer much encouragement nor do they suggest a reversal of those trends. This points to a key problem. We have fewer people in the highly productive age groups supporting more and more people in the young and old age categories.
>
> "You might well surmise that the productive age groups are going to be compelled to use more of their income to support schools, churches, welfare, recreational programs, and many other established and socially accepted, demanded, and desired institutions if Montana is to support these things entirely from state revenues. What happens if we don't? The quality and quantity of these programs and services will most likely suffer. More people will be induced to leave Montana for areas where services and programs are available in the quantity and of the quality desired and at a more attractive price. This out-migration will in effect place a still heavier burden on the remaining citizens. At the same time, it will decrease the inducement for in-migration.
>
> "Montana's economic growth and development are closely and directly associated with the human resources of our state. Rural out-migration in response to agricultural adjustment has been taking place throughout the nation and will continue for the next few decades. This agricultural adjustment is of greater significance to Montana than to most of the nation because a high percentage of our population is rural. (See Table VIII for comparison.) Consequently, the urban areas of the state will have to grow faster than the national average to assimilate and offer employment opportunities for the displaced rural population.
>
> "This urban growth must take place in areas other than those supporting agriculture because fewer local services are required by modern agriculture. It would seem that industrial development, coupled with expanded service centers, is needed if Montana's economy is to grow and expand."[10]

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[10] Ibid, p. 5. (Underlining and words in parentheses supplied.)

Apparently Rixe and Ewasiuk view past and current population trends in Montana as being undesirable and express the view that economic growth in Montana will have to come from industry. If the citizens of Montana feel it important to stop or slow down this out-migration, then suitable employment opportunities for these people must be created in the State.

Employment

What are the chances of finding suitable employment to prevent this out-migration? Perhaps an examination of employment in the State along with some projections that have been made can give some clues as to what the State may expect.

Table V shows the division breakdown in employment changes between 1950 and 1960 along with a projection made by Henderson and Krueger for the period 1960 to 1975. Although total employment increased in the decade of the 1950's, it was not sufficient to absorb the increase in population. Montana has had a participation rate[11] of between 35 and 40 percent. (In 1950 it was 38.9 percent, in 1960 it was 36.8 percent.) If one assumes a participation rate of roughly midway between the 1950 and 1960 figures (about 37.5 percent), then the increase in population of 84,000 between 1950 and 1960 should have added approximately 31,500 to the labor force. Yet Table V shows that Montana added approximately 6,000 to its labor force during this period. Three reasons probably account for this difference:

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[11] Participation rate is computed by dividing total labor force by total population.

TABLE V

EMPLOYMENT CHANGES IN MONTANA BY MAJOR DIVISIONS
FROM 1950 to 1960 AND PROJECTED TO 1975

Division	Change in Numbers Employed, 1950-1960	Projected Change in Numbers Employed, 1960-1975
Agriculture	-14,550	-8,679
Mining and Oil	-3,484	-335
Manufacturing	1,887	2,678
Railroads	-4,900	-2,117
Transportation, Communication, and Utilities (except railroads)	1,618	2,501
Wholesale Trade	1,673	1,538
Retail Trade	2,407	5,368
Finance, Insurance, and Real Estate	3,149	2,604
Service and Miscellaneous	6,469	10,654
Construction	1,109	3,302
Federal Government	1,400	2,465
State and Local Government	8,900	12,851
Total Change	5,678	32,810

SOURCE: James O. Henderson and Anne O. Krueger, National Growth and Economic Change in the Upper Midwest, Table 1-3, page 12 and Table 2-1 page 22.

first, the large number of births recorded in the 1950's would have had the effect of lowering the participation rate; second, the 25,000 out-migration during the period would have reduced the work force; and third, the increasing number of unemployed workers during the period. From 1950 to 1960, the number of unemployed increased in the state by over 5,000. (On the census date, April 1, 1960, the United States unemployment rate was 5.1 percent whereas the Montana rate was 6.8 percent, one of the highest in the upper-midwest and west.[12]) By way of comparison, if employment opportunities in Montana had kept pace with the rest of the nation, the State would have had another 19,000 employed in 1960.[13]

Although the State employment situation has substantially improved since 1960, it has not yet reached the point where the employed labor force is keeping up with population changes. According to the Montana State Employment Service, the State had an employed labor force on April 1, 1960 of 231,300 whereas on April 1, 1965 it was 239,300, an increase of 8,000 workers. With an estimated population increase of 31,000 during this period and a participation rate of approximately 37.5 percent, the State should have had an increase in the employed labor force of near 12,000.

Even though the average rate of unemployed has been down in recent

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[12] Statistics were taken from U.S. Census of Population, 1950 and 1960.

[13] The U. S. rate of increase during the 1950's was 14.5 percent whereas the Montana rate of increase was only 6 percent (the lowest in the five Rocky Mountain States surrounding Montana). Thus the difference of 8.5 percent times the 1950 Montana employed labor force of 219,000 would give the added employment of approximately 19,000.

years and is now below the United States average, unemployment is still a problem in Montana as many in the work force are employed in seasonal work. For example, agriculture, construction, lumbering, trade, and services are all areas where the annual fluctuation in employment is large. (Note the wide swings in unemployment in Figure 1 between Montana and the whole United States illustrating the strong seasonal affect on jobs within Montana.) If the State is going to make strides in increasing per capita incomes and sustaining economic growth, it needs more year-round employment.

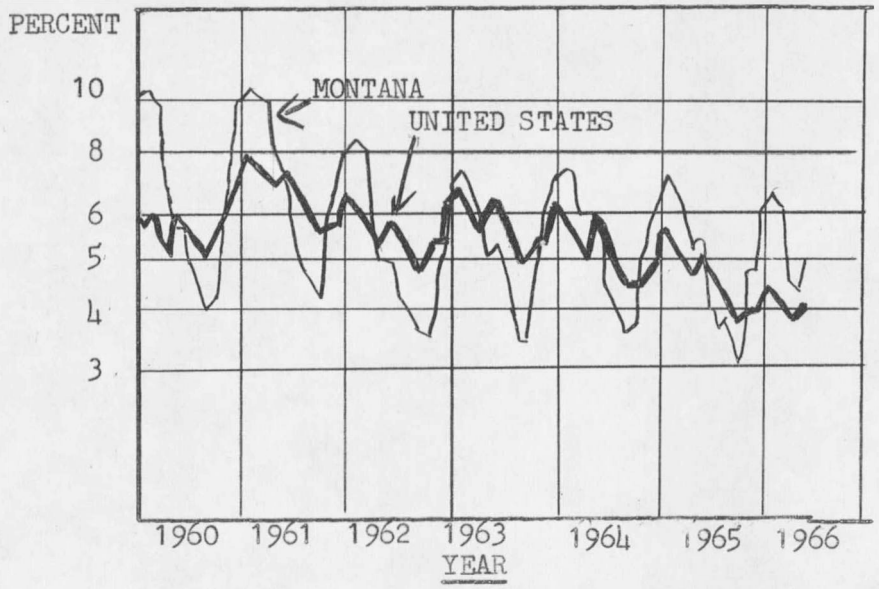

Figure 1 - Unemployment Rate, Montana and United States, January 1, 1960 to July 1, 1966.

SOURCE: 1966 Annual Report, Montana Unemployment Compensation Commission, Helena, Montana.

A look at the various segments or divisions of employment also gives some enlightenment. Table V shows that agriculture, mining, and railroads

have all lost workers during the 1950's and are projected to continue losing workers during the period 1960-1975. Agriculture and mining are considered basic industries[14] that support employment in other areas. Another basic area, manufacturing, has increased and it is expected to continue to increase but not to the extent that it will offset the decreases in agriculture and mining. With respect to manufacturing and construction, Paul Blomgren, former Dean of the College of Business Administration at the University of Montana, has stated:

> Thus construction serves, and has served, as a stimulus to the Montana economy, but it does not appear to be an industry upon which the state can rely as a major support in the long run. Other sectors of the economy must bear the major burden of support and provide the necessary diversification in the economy.
>
> Manufacturing is a sector of the economy on which many people pin their hopes for growth and diversification in Montana. This is the sector usually referred to when groups speak of the need for 'industrial development.' The truth is, however, that manufacturing (other than lumber and wood products) has declined in importance in the Montana economy.[15]

In the 46-year period from 1919 up to 1965 manufacturing employment in Montana increased approximately 15 percent. During this same period, manufacturing employment in Montana as a percent of the United States employment in manufacturing actually decreased. However, during the decade of

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[14]A basic area being defined as one serving markets beyond certain boundaries; in this case, the state is the boundary. Any economic activity that serves only local markets is a service area and adds little to the strength of the economic base.

[15]Paul B. Blomgren, "The Montana Economy in Perspective," Montana Business Quarterly, Volume 1, No. 1, p. 25.

of the 1950's, the Montana rate of change in manufacturing employment closely approximated the United States average, .90 in Montana to .93 in the United States.

If some of the basic industries are not doing too well, from where can the support for the Montana economy come? Three of the most rapidly expanding sectors in the Montana economy are trade, services, and government. During the 1950's, these areas expanded slightly more than 20 percent and the growth projections in Table V indicate an even greater expansion in the period 1960-1975. Several factors are worth noting in the expansion of these three areas. In the trade area, most of this growth is directly related to growth in other sectors of the economy. Thus if the State can stimulate greater growth in other areas, trade will be also stimulated, thus helping the Montana economy.

Growth in the services sector has been in large part due to the growth of tourism and recreation. Although most states are actively engaged in capturing this business, Montana has been blessed with many natural features that should give the State an advantage in obtaining more than its one-fiftieth share of the projected increase in recreation and tourism within the United States. However, if the expected growth does come in the trade and service sectors, it should be recognized that unless wages increase drastically (something that is not too likely), then these areas are likely to draw the per capita income even farther away from the United States average. Table VI gives the average incomes in Montana for 1960 and 1965. This table shows the disparity that exists in average earnings in the

TABLE VI

AVERAGE EMPLOYEE EARNINGS IN MONTANA BY DIVISION, 1960 and 1965

Division	Average Earnings Per Employee 1960 (Dollars)	1965 (Dollars)
Mining	5,426	6,578
Contract Construction	5,239	6,485
Manufacturing	4,990	5,911
Transportation and Public Utilities	4,846	5,871
Finance, Insurance, and Real Estate	4,145	4,867
Trade	3,683	4,074
Service and Miscellaneous	2,821	3,177

SOURCE: Montana Labor Market, Supplements 1964-1965, Montana State Employment Service, Helena, Montana, March, 1966.

different divisions and highlights the poor average earnings in the trade and service divisions. If chronic unemployment existed, then expanding employment in services would be desirable. In Montana, where unemployment is due frequently to the seasonal nature of work opportunities, the State needs more opportunities in high paying, year-round employment. If Montana could expand her industrial sector, perhaps this would be far better than the large forecasted growth of seasonal type work often found in services.

Employment within Montana in the Federal Government is projected to

increase about 25 percent. In state and local governments the projected increase is near 45 percent. To the extent that the increase in Federal Government employment does occur it will aid the economy of the state. Most of the people hired by the Federal Government are year-round employees and have wage levels that are high enough to help the economy of Montana. The increase in state and local government employment would be of little help in the State's quest for economic growth. The more than proportionate growth in state and local government employment over population growth could mean that per capita taxes will be higher.

Table VII shows the employment breakdown between the United States and Montana. This table shows that state and local government employment is already higher in Montana than for the United States. However, this would follow due to the necessity of maintaining minimun essential, but increasing, services for a low density population. However, Table VII also shows that employment in Montana is different from that found in the entire United States. Montana has more of its labor force in agriculture (but the difference is decreasing) and it has fewer in manufacturing (where the difference is not decreasing). A narrowing of this gap in manufacturing would help the economy of Montana provided growth comes from the right kinds of firms.

Brain Drain

Education and economic growth go hand in hand. There is a high correlation between the amount of education one has and the amount of remuneration one can command, that is, the more education the higher the wage

TABLE VII

PERCENTAGE OF EMPLOYMENT BY DIVISION, MONTANA AND THE UNITED STATES, APRIL 1, 1960

Division	United States (Percent)	Montana (Percent)
Agriculture	6.5	16.8
Mining and Oil	1.2	3.3
Manufacturing	26.4	9.4
Railroads	1.4	3.9
Transportation, Communications and Utilities (except railroads)	5.1	4.6
Wholesale Trade	5.1	4.1
Retail Trade	16.3	17.7
Finance, Insurance, and Real Estate	4.5	3.6
Service and Miscellaneous	14.9	13.9
Construction	5.7	6.3
Federal Government	3.4	4.1
State and Local Government	9.5	12.3
Total	100.0	100.0

SOURCE: James O. Henderson and Anne O Krueger, National Growth and Economic Change in the Upper Midwest, Table 1-2 page 12.

or its opposite in that lower wages go to those with less education. Encouraging education in the State of Montana would not only benefit the person receiving the education but it would also help the State's economy to grow.

Suppose all or most or even some of these educated people left the state after receiving their training. If this happened, then the salaries that these people could command would benefit the state where they were residing. The state that educated these people would be losing in two ways: it loses its capital investment (to the extent that education is subsidized by the taxpayers of that state), and it loses the income that these people would have received if they could have been gainfully employed within that state.

What is the status of the educated in Montana? One can find both pros and cons as to whether or not there is a problem of having our educated youth leave the State. However, a few facts should help to clear the issue.

Charles Hood, Director of Placement at the University of Montana, reports that from September 1, 1964 to September 1, 1965, 52 percent of the graduates of the University of Montana placed by the placement center accepted positions in the State. At the same time, Hood states that only 38 percent of those taking jobs in industry and government remained in the State.[16]

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[16] Great Falls Tribune, September 23, 1965.

A questionnaire[17] completed by nearly 500 seniors at the June 1966 Montana State University Commencement showed that 216 of the group (all from Montana homes) had accepted civilian employment.[18] Of this group, 105 or 49 percent were leaving the state to accept employment elsewhere. Table VIII gives the results of this questionnaire. These results follow closely those obtained by Hood at the University of Montana.[19]

TABLE VIII

EMPLOYMENT LOCATION OF 216 GRADUATING SENIORS OF MONTANA STATE UNIVERSITY, JUNE 1966

University Division	Graduates Accepting In-State Employment (Number)	Graduates Accepting Out-of-State Employment (Number)	Percentage Accepting Out-of-State Employment (Percent)
Agriculture	20	5	20
Engineering	15	41	73
General Studies	16	14	47
Professional Schools:			
Dept. of Education	27	13	33
Other Departments	33	32	49
Total	111	105	49

[17]Prepared by Charles Hash and James Cameron, both of Montana State University. The results have been tabulated but have not yet been published.

[18]The balance were continuing their education, going into the military now or in the immediate future and thus were not seeking employment, had not yet obtained employment or were still negotiating for employment, were out-of-state students, or for various other reasons were not seeking employment.

[19]In addition to disclosing the number leaving the state, the questionnaire also asked for salaries. The resultant tabulation disclosed that those leaving the state were receiving approximately $100 more per month than those accepting employment within the State.

With close to 50 percent of the graduates from the two leading universities in the State leaving to accept employment elsewhere, one can conclude that the State does have a "brain drain." In the scientific (chemistry, physics, mathematics, etc.) and engineering areas, the questionnaire disclosed that the talent loss was much higher than 50 percent. A study done on the Upper Midwest region (including Montana) states that ". . . the Upper Midwest Region graduates about 4 percent of the nation's scientists and engineers, but less than half of these remain in the region."[20] Ralph Yapp, nuclear physicist, estimated that "Each scientist who migrates from his home state to live in another, represents a loss of at least $50,000 a year to the state he leaves."[21]

It should be pointed out, though, that Montana does experience some inflow in brain power. For example, doctors and dentists are educated elsewhere and migrate to Montana. Thus the net talent loss may not be as alarming as it would appear at first glance. However, from the standpoint of economic growth, it would be desirable to keep whatever educated manpower that now leaves Montana within the State. Yet until suitable employment opportunities exist in the State and there is a narrowing of the wage differential between in-state and out-of-state opportunities, one cannot foresee a change in the State's "brain drain." Discussions indicate that many of those leaving the State would remain if the State could create

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[20]Kirk P. Draheim, "Technological Industry in the Upper Midwest," Upper Midwest Economic Study, Technical Paper No. 11, June 1964, p. 18.

[21]Deseret News, Newspaper Agency Corporation, Salt Lake City, Utah, August 8, 1966, p. 10-A.

employment opportunities and at least partially overcome the wage differential.

Purpose and Importance of Study

In recent years, some economic indicators are pointing out that the relative economic position of the State of Montana is deteriorating. However, some people within the State refuse to accept this. Blomgren is disturbed by this latter view and states:

> ". . . I am disturbed by an attitude of unrealistic optimism and an unwillingness to face unpleasant tasks on the part of some people. I am disturbed by an attitude 'relax and somehow we'll muddle through' on the part of others. I feel it is high time that we dedicate ourselves to a philosophy of realistic optimism and a willingness to solve unpleasant problems by long range effort. If we do this, our economic future can be much better than it will otherwise be."[22]

Economic growth is not predestined but depends upon the people, their institutions, their laws, and the characteristics of their environment. It is not something that happens by chance but rather it is something that must be cultivated and stimulated.

In Montana, per capita income has been lagging, far too many employment opportunities are in seasonal work, and too many talented youth are leaving the state. The growth sectors of the State's economy, namely, services, trade, and government, are not the sectors that will substantially help the economic growth of the State. The State needs employment in jobs that offer good annual wages and do not boost per capita tax loads.

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[22]Paul B. Blomgren, op. cit., p. 28.

For economic growth to occur, growth must first be stimulated in the basic areas of agriculture (including forestry), industry, mining, recreation-tourism, and, to some extent, government. If these areas can be stimulated, then growth in other areas such as wholesale, retail, services, transportation, and construction will follow naturally.

In the basic areas, agricultural employment has decreased and future projections indicate that it will continue to decrease. Mining has not been a large employer in Montana (about 3 percent of the labor force) and prospects for any large growth in the future are considered small.

A large increase in the government sector is forecasted but with mixed feelings. There are those who feel that growth in government is undesirable both socially and monetarily (due to tax burdens). Others feel that an expanding government is desirable to provide for an expanding array of socially acceptable public goods and services and are willing to pay the cost. Some economic benefits will result from the projected growth in both federal and state government employment. However, the full extent of this benefit would depend upon factors beyond the scope of this study such as analyzing, among others, the derived growth from the public expenditures. (For example, the amount of added tourist trade the State would receive as a result of an improvement in highways or recreation facilities.) With only a moderate population increase forecasted for Montana, some restraints are bound to be placed upon the growth of state and local government.

Recreation-tourism offers the promise of future gains in employment and will help economic growth in Montana. However, the pay received by

labor directly involved in this area is frequently low as compared to some other basic areas; in addition, employment is frequently seasonal. Thus growth in this basic area would not be expected to substantially improve the relative standing of per capita income in Montana

The one other basic area left is industry. In this area, the value added is increasing but growth in employment has been small. (Currently the State has about 10 percent of its labor force in industry.) Industry, as a rule, offers good wages and year-round employment, both of which are needed in Montana to stimulate economic growth. What are the State's chances of obtaining some industrial plants? Opinions vary but one thing is sure--industry has not been beating on the door to enter the State. Wayne Baskin, Director of Industrial Development of the Bureau of Indian Affairs, was reported to have said: "The thing Montana must realize is that industry isn't going to fight its way into the State."[23]

Industry wants a location that offers a competitive advantage. For example, in the Wall Street Journal of November 30, 1964, the Southern Railway System listed the following as locational advantages of its area: abundant natural resources, economical transportation, moderate climate, large number of willing workers, waiting markets, vast supply of water, plenty of power, and room to grow. In order to encourage industrial growth, does Montana offer these advantages? Perhaps, Montana offers other advantages that would be more important to industry that it should be promoting.

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[23]Great Falls Tribune, October 28, 1965, p. 26.

If so, they should be listed so that the State can put its industrial development money where it will do the most good.

McGraw-Hill conducted a survey among executives of manufacturing industries that reportedly listed Montana as last in terms of consideration for industrial locations.[24] If this feeling is prevalent throughout industry, maybe the State could save the money that is now being spent to stimulate industrial growth and put these funds into other areas.

Such questions as posed in the foregoing paragraphs have caused many people to wonder what role industry can play in the development of the State of Montana. This research is an attempt to shed additional light on the subject.

Hypothesis

A few people throughout the State seem to feel that industry is waiting at the border to get in. The hypothesis of this paper is that industry is not anxious to come to Montana. Stated in more formal terms, the hypothesis is as follows: The State of Montana cannot, under present or foreseeable conditions, increase its rate of industrial growth because of (a) the lack of enough favorable location factors to influence industrial firms to locate in the State, and (b) apathy of the citizens of Montana concerning the desirability of industrial growth and of actively pursuing an expanded industrial base.

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[24] Plant Site Survey, A Study Among Business Week Subscribers, New York, McGraw-Hill Inc., January 1964.

Chapters 2 through 5 will discuss part (a) of the hypothesis; chapter 6 will discuss part (b) of the hypothesis--citizens' attitudes toward industry.

Methodology

The methodology used in testing the hypothesis was as follows:

1. Review location theory and the characteristics of Montana to determine if enough favorable location factors exist that will induce industry to locate in the State.

2. Make empirical studies within three different groups of industrial firms to determine if additional location problems exist in Montana that were not discovered in reviewing the general theory and characteristics of Montana. In making the empirical studies the observational design was as follows:

(a) Select a sample from firms that are presently operating in the State to determine why they located in the State, their attitude regarding their location, and to determine what favorable or unfavorable location factors they have encountered. Firms operating in Montana were stratified by the "Standard Industrial Code" classification and then a 20 percent random sample was selected from firms within each major group of the classification.[25] A mail questionnaire was then sent to each firm selected. (See

[25]An exception to the selection of a random stratified-sample was that firms with an obvious local clientele have been eliminated--such as bakeries attached to grocery stores and most newspapers. Such firms do fill a local demand but their scope is such that they have little to do with the "industrial climate" in the State. Their locations are not so much one of selection as of filling a void for a locally demanded product. Therefore a decision was made to exclude these firms on the assumption that they would offer little or no help in assessing the future of industrial growth in the State.

Appendix I for a copy of this questionnaire.)

(b) Send a mail questionnaire to forty-five firms that have contacted an industrial development group within the State. (See Appendix II for a copy of this questionnaire.) Owing to the difficulty of securing names and addresses of firms that have contacted someone in the State and who have had a sincere interest in Montana locations, the first forty-five firms where adequate information was obtained were sent questionnaires. It was hoped that this group of firms would shed additional light on present environmental influences that are or are not conducive to the industrial development of Montana.

(c) Select twenty firms that have operated within Montana but that have now discontinued these operations. Firms selected for this mail questionnaire were those listed in the 1965-1966 but not in the 1967-1968 Montana Directory of Manufacturers and Buyers Guide. (See Appendix III for a copy of this questionnaire.) It was hoped that responses to this questionnaire would disclose other problems of a Montana location not found in firms presently operating within Montana.

3. Conduct personal interviews with Montana citizens to determine their attitudes toward industry and industrial development. The interviews were conducted in various locations throughout the State and an attempt was made to obtain a cross-section of the people in the State (e.g., young and old, skilled and unskilled, city and rural, etc.). The approximate number of this convenience sample was one-tenth of one percent of Montana residents. In addition, some students at Montana State University were interviewed to

determine if their attitudes differ from those expressed by the general citizenry in the State. (See Appendix IV for a copy of this questionnaire.)

Limitations

Although the primary purpose of this research is to assess the possibility of increasing the rate of industrial growth in Montana, an obvious offshoot to this might appear to be the selection of specific firms that possibly could locate in the State. However, to be specific in the selection of firms would mean that feasibility studies would have to be made for each firm and in many cases for each product produced by that firm. Lack of research money has precluded such an approach in this study, but also such an approach is not considered efficient. For each firm found capable of locating in a given area, hundreds or perhaps thousands would not fit that location. It is felt that a more efficient approach would be to establish a framework within which the weeding out or selection process can take place. It is toward establishing and analyzing such a framework that this research is directed.

> It is an inexcapable fact. . . that geographic location becomes as important to producers of goods as sound management, modern plant structure, and astute merchandising policies.
>
> Leonard C. Yaseen

Chapter II

GENERAL FACTORS INVOLVED IN THE LOCATION OF INDUSTRY

Introduction

American industry is on the move. Because of an expanding population, changing markets, and a host of other reasons, industrial management is reappraising existing locations and assessing new ones. No longer is industry tied to one area but rather it has opportunities for successful operation in many areas.

Competition is prevalent throughout most industrial processes; therefore care must be exercised in choosing a location that can meet this competition. Because larger investments are required for new facilities, business simply cannot afford a "hit or miss" attitude in site selections. Business, therefore, must carefully assess those factors that lead to what management must decide is a successful location.

What constitutes a successful location? Offhand, it is difficult to determine. However, there are the experiences of others to help lead the way. Starting with Von Thunen, expanded by Weber, Losch, Hoover, and a whole host of recent writers, today there is a theory of location. In applying this theory, rarely does one find that ideal location where

everything expounded in the theory is favorable. The usual situation is that each location has some combination of favorable and unfavorable factors.

Because not all factors are of equal importance in selecting locations, some are dominant or crucial in the site selection and are called primary factors of location; others are of lesser importance and are labeled secondary factors. The primary factors are those that limit the location to a particular area or type of site. The secondary factors are used to select a particular site from the available locations selected by using the primary factors. An example would perhaps clarify this relationship. Suppose that a manufacturer wished to add a new plant and this plant will require abundant water from a natural hot spring and commercial airline transportation facilities within 20 miles. These two factors are dominant, or primary, in the location of the plant. Further, suppose that one can find ten locations where abundant water from a hot spring and the required airline transportation exist. The selection of the one best location out of the ten will be through an examination of the secondary location factors.

It is difficult, without delving into an actual situation, to know which location factors are primary, secondary, important, or unimportant. However, this does not destroy the theory of location. One knows those factors that should be analyzed from the theory but the depth of the analysis depends on the circumstances of each case. The following sections of this chapter will discuss the major factors of location as well as mention some of the minor ones. The discussion is intended as background to give a better understanding of the situation in Montana which is covered in

subsequent chapters.

Location factors can be grouped into four categories. Three of these are objective in nature--demand factors, cost factors, and governmental factors--while the fourth is subjective--personal factors. The primary location factors are almost always found in the demand and cost factors and, thus, are critical in most site selections, although not necessarily in the same order or degree. The last two categories--personal and governmental--may or may not influence any given site decision. However, it is known that they exert a big influence in some decisions and are important in the overall concept of location theory. An examination of each of these groups follows.

Demand Factors

Most writers on location theory assume a given demand that remains virtually unaffected by site selection. They primarily have emphasized the search for the location that offers the lowest production and distribution costs. In stressing costs, they have ignored the fact that demand is a variable that is influenced by location and in turn influences location.

By demand is meant the various quantities of a product that would be purchased in a market in a given period of time at various prices or at various incomes. The amount of product demanded at various prices for each individual firm is partially influenced by the shape of its demand curve, the amount of competition, and the size of its market area. As these factors can also influence the location decision, they are discussed below.

Shape of the Demand Curve

The shape of the demand curve refers to the response in the amount sold (quantity) to a change in price. The higher this response the more elastic is demand; the less the response, the more inelastic the demand. The individual firm needs some measurement of how elastic its demand is in setting up pricing and location strategy. For example, the more inelastic the demand for the product of an industry, ceteris paribus (other things being equal), the greater the tendency for firms to concentrate their locations. The reasons for this action are evident when one looks at an industry demand curve, especially in markets that are monopolistically competitive or oligopolistic. An individual firm in this industry finds that the increased quantities sold in response to price changes are so small that it pays not to change price and to emphasize factors other than price. Thus in selecting a location, a site with low production and distribution costs plus other agglomerating advantages (such as a good transportation network or good banking facilities) is selected. It is no small wonder that this site is also the location of competitors who were also interested in these same factors.

For an industry having an elastic demand, the individual firm within that industry will tend to disperse instead of concentrate. By locating away from competitors, the firm can establish for itself a quasi-monopolistic location. Then by emphasizing price and attempting to magnify demand within the area of their operation, this firm can increase revenues

over those that would have been earned if the firm had concentrated at a location near its competitors.

Location and Reaction of Competitors

From the standpoint of each firm, the ideal location would be a market area free from competition and with low production and distribution costs. However, complete freedom from competition rarely exists in our society.

How does competition influence location? First, assume that a proposed new plant is going to produce a product that is homogeneous to that presently being produced by competitors. In this type of situation reasonable knowledge probably exists as to how competitors will react to new competition. If the reaction is to change the price of the product, the new plant can choose a location near its competitors if it expects that its costs of production will be lower than competitors'; or it could choose a more remote location away from competitors if it felt that this location provided an adequate demand for its output and would not seriously disadvantage itself on production and distribution costs. If it follows the latter procedure, it is said to be pursuing quasi-monopolistic locating policies. Many of the industrial firms where economies of scale are minor or non-existent locate so as to be away from as much active competition as possible. Bread and milk processing are examples of this type of location policy.

If the reaction to a new homogeneous firm is other than price, then the new firm will seek a least-cost location that would probably be

reasonably close to competitors' locations. The steel industry is an example. It does not actively compete in price yet about 80 percent of production is located in the Chicago to Pittsburgh area.

In the case of firms producing substitutable (heterogeneous) products, locations tend to be more agglomerated. Less certainty exists with respect to actions of competitors and to influences on demand of price changes because of the existence of substitutable products. In this situation, the uncertainty brings producers together. The huge Merchandise Mart in Chicago illustrates this strong tendency of firms selling close substitutes to locate together.

In seeking its maximum profit location, a firm must recognize possible reactions of other firms producing identical or close substitutes. It must select its location, determine its output, and set its price only after considering not only the direct consequences but also the possible indirect consequences from the reactions of other firms.

Market Areas

A firm may examine the elasticity of its demand curve or the location of its competitors to determine location strategy, but sooner or later it must determine a market area that will be serviced by its production facilities. In recent years, market area analysis has been increasing in importance. An efficient transportation system and higher labor mobility have freed increasing numbers of plants from the necessity of locating close to raw materials and an immediate labor supply. Many firms have been able to take a second look at existing locations and market areas.

Demand affects market area selection in essentially two ways. One is that in selecting a market area, ceteris paribus, an area is picked that has the best demand or sales potential. The second way is that in selecting a site, a site that will magnify demand is picked. An example would perhaps demonstrate this relationship. A firm is considering manufacturing and marketing its goods in either the Rocky Mountain States or the Pacific Coast States and demand is determined only by area. In selecting its market area, the rational firm would choose the Rocky Mountain States because of the greater area and hence greater demand. The next step is to select the exact location in the Rocky Mountains where demand will be at its highest. If demand is constant at any location in the Rocky Mountains, then the firm could locate anywhere in the region. However if demand can be intensified from a particular location, then, ceteris paribus, that location would be selected. Service, for example, is frequently stressed. However, one can be sure that demand is considerable higher at some locations than at others, ceteris paribus, because of better service.

In the United States, many manufacturing firms are oriented toward national rather than local markets. In locating, these firms tend to select sites in those areas where demand is most heavily concentrated. An advertisement sponsored by The Cleveland Electric Illuminating Company, in the Wall Street Journal of March 31, 1964, stated that within 500 miles of Cleveland, Ohio, over "half the people of the United States are concentrated," that "54 percent of the nation's retail sales are made," and that "twenty-one of the thirty 'billion dollar-or-more' industrial markets"

exist in that area. It is no wonder market oriented firms are attracted to an area with such large demand possibilities.

Fortunately for states seeking industrialization, demand for some of our industrial output is scattered enough to permit decentralization of facilities. As mentioned earlier, 80 percent of the steel facilities are located in the Illinois to Pennsylvania manufacturing belt where much of the demand for steel also exists. Yet there are some successful steel producers located outside that region that are serving local and regional markets in their own areas of operation. As a rule though, plants located away from the heart of the market tend to remain small[1] even though other location factors, primarily costs, are favorable.

Summary

Although the factors of demand were discussed independently, it should be recognized that they are interdependent. Elasticity, competition, and market areas together combine to help determine demand.

The treatment of demand is in no sense of the word complete.[2] But, if the reader has obtained some appreciation of demand as a factor of location without being unduly burdened with a more detailed analysis, then, to that

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[1] Rapid changes in the size of the markets in the area of the small producer could materially aid his growth. But as a rule, once markets are formed changes occur rather slowly. Exceptions to this would be calamities brought on by war or so-called "acts of God."

[2] For excellent and more complete discussions of demand as a factor of location see Melvin L. Greenhut, op. cit., Chapters 2, 3, and 6, and Walter Isard, Location and Space-Economy, 1956, Chapter 7.

extent, it has achieved its purpose.

Cost Factors

Demand for a firm's product is determined exogenously whereas costs are determined endogenously. Thus the existence of demand does not necessarily insure sales. If the offering (or supply) price of a firm is above the demand price, no sales will occur. This section examines determinents of the offering price--cost of production.

Costs can determine and limit market areas without ever looking at demand. Consider Figure 2 as an illustration. Presented are cost curves (average total costs and marginal costs) for two firms where (for simplicity) consumers are assumed to be evenly spaced along a line AF. Firm #1 has located at point A and Firm #2 is considering locating at point F. No other competitors are presently operating in or considering this area. Moving along line AF it can be noted that the average costs of Firm #1 decrease to Point B (representing production economies, perhaps due to lowering production and distribution costs, between points AB); beyond point B, costs increase (showing production diseconomies in that it is costing more to produce and distribute each additional unit of output). The MC-#1 is the marginal cost curve for Firm #1 and determines the relevant range of output for this firm. For Firm #1, the market area could go as far as point C and it would prefer that its market area not be less than point B.

In firm #2, their output range would be between ED for the same reasons

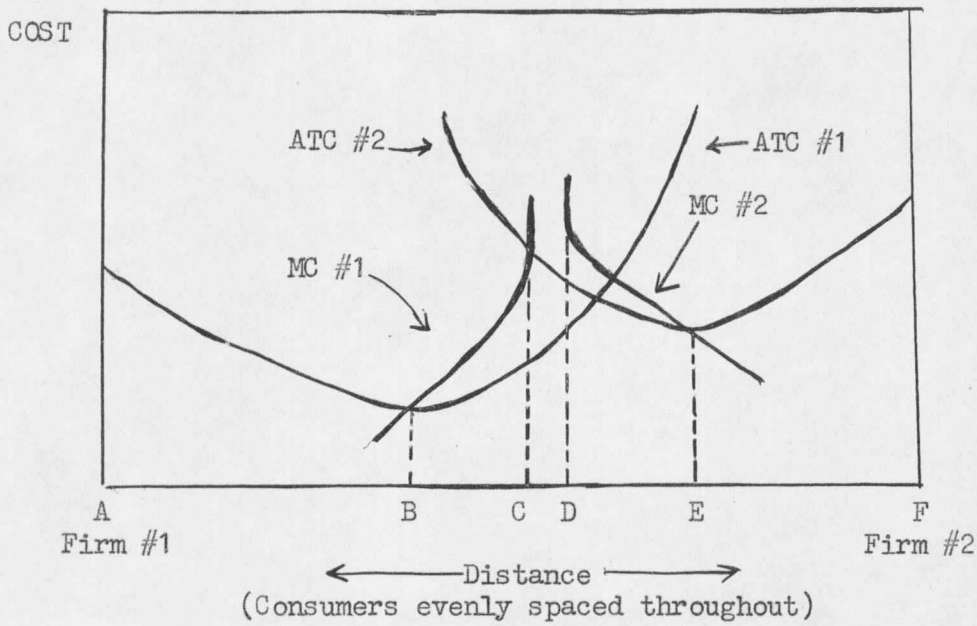

Figure 2 - Cost Curves for Two Competitors

SOURCE: Adapted from an illustration and discussion found in Walter Isard, op. cit., p. 148-50.

as for Firm #1. Note that Firm #2 has higher costs than Firm #1, but by locating away from Firm #1 it has its own market area. Those consumers located between points C and D will not be serviced by either Firm #1 or Firm #2. They remain as an undeveloped market. If Firm #2 located at either point E or D, the marginal cost curves would intersect and the two firms would be in competition for the area around the intersection point. However if consumers desired the lowest price, then the intersection of the marginal cost curves would be the outer limits of the market areas for the two firms. Also if intersection does occur, all consumers would be serviced and an area such as CD in Figure 2 would not occur. Thus costs can be of

importance in setting market area limits.

Along the same line as mentioned above is another cost characteristic that is helping to shape plant locations--automation. As automation occurs, cost structures change. More of the total costs are becoming fixed and fewer are variable. As this occurs, plant output needs to increase to take advantage of economies of scale in spreading the large fixed costs over larger outputs. In industries where automation is possible, one can expect to see increasing centralization of facilities. This will work to the disadvantage of those areas that might have been in line for the decentralized facilities if automation had not occurred. The full extent of automation will, of course, depend upon the rate of growth in demand and the extent of the output necessary to achieve economies of scale in the automated plant.

In location literature, costs have received by far the most emphasis and, perhaps, rightly so. One reason for this is that the many thousands of state and local development agencies seem to stress cost analysis. Another reason is that firms selecting locations probably have already determined demand before the publicity of their site hunt is announced. For these and whatever other reasons costs are stressed, they are crucial determinants in most site selections. Of the ten biggest pitfalls in plant location as listed by Leonard Yaseen, seven are related to cost factors.[3]

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[3]Leonard C. Yaseen, "The Ten Biggest Pitfalls in Plant Location," Dun's Review and Modern Industry, March, 1957, p.49. The ten pitfalls listed by Yaseen are:

1. Miscalculation of labor costs.

In analyzing cost factors, location theory and economic theory are no strangers to each other. Location theory uses the economic principle of factor substitution. This principle is that the cheap factor(s) should be substituted for the expensive one(s) to the point where:

$$\frac{\text{Marginal Product of Factor 1}}{\text{Price of Factor 1}} = \frac{\text{MP of Factor 2}}{\text{Price of 2}} = \frac{\text{MP of all other factors}}{\text{Price of all other factors}}$$

In essence, the equation states that the added output of one additional unit of a factor divided by the cost of that one additional unit of a factor should be equal to that obtained from all other factors. Thus finding a location that has, for example, high labor costs, does not necessarily rule out that location if at the same time that location also has either a high level of labor productivity or a cheap factor (for example, capital) that could be substituted for labor. Yaseen has estimated that "in many industries a differential of as much as 10 percent of total manufacturing and distribution cost can be effected simply by virtue of geography."[4]

In the discussion that follows, the more important of the cost factors will be analyzed. They will be treated as if they were separate and

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2. Choice of a state where the labor reservoir was inadequate.
3. Neglect to anticipate growth.
4. Carelessness to checking the site.
5. Lack of distribution know-how.
6. Failure to predict impact of plant on community.
7. Neglecting to check on supporting facilities (fire, schools, etc.)
8. Reliance on misinformation on utility costs.
9. Underestimating the importance of taxes.
10. Failure to recognize cost relationship.

[4]Leonard C. Yaseen, Plant Location, p. 9.

unrelated, but it must be recognized that they are largely interdependent.

Transportation

In those industries where the cost of gathering raw materials and distributing the finished product are an important part of total costs, then transportation becomes a significant factor of location. In the early development of manufacturing in the United States, most industrial firms located near the source of their raw materials. These firms are called raw material (or resource) oriented firms. As our country grew and developed, some firms found that they could economically operate at or near their markets and are called market oriented. The chief reason some firms operate at the market and others operate close to raw materials is transportation. Yaseen states that transportation is the "least understood and most frequently misinterpreted" factor of location.[5] Greenhut feels that transportation is a major determinant of location for two reasons, cost of service and type of service.[6]

Ignoring other factors, the objective of a firm in locating a new plant is to minimize the combined gathering and distribution cost per unit of product. Usually, this will call for a location at the source of the raw material, at the market where the finished good is sold, or somewhere on a reasonably straight line between those two points. Figure 3 illustrates

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[5] Ibid, p. 14.

[6] Melvin L. Greenhut, op. cit., p. 106.

this principle. In this figure, three lines are presented showing raw material gathering costs, finished goods delivery cost, and total transportation for both raw material and finished goods. The lines are determined be assuming a location at either the market or raw material source. As Figure 3 is drawn, the total transportation cost is lowest by locating the new plant at the market. However, the actual point of production in most situations is a composite of variables that would include such things as characteristics of production, the peculiarities of our transportation rate-making system, and the type of service needed from the transportation system.

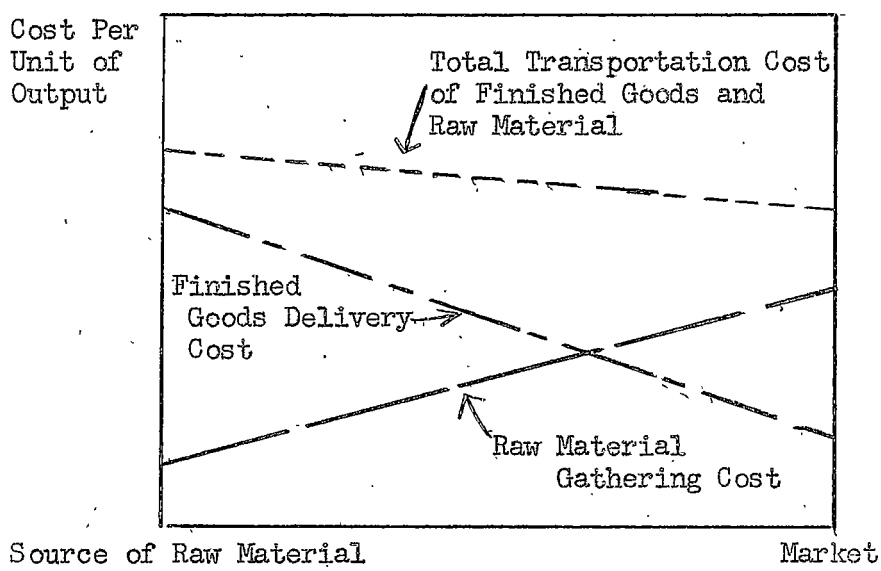

Figure 3 - Transportation Cost

Where there is extensive weight reduction of the raw materials in the production process, production tends to take place at or near the raw material source. When production adds considerable weight to the raw material,

the opposite is true and production tends to locate at or near the market. The smelting of most ores, ginning of cotton, canning of fruit juices, and packing of many fish products are examples of weight-losing processes that find it economical to locate at or near the source(s) of raw materials. Those processes that use some ubiquitous material--those available nearly everywhere at similar cost--tend to locate at the market. Soft drink and ice manufacturers are examples.

In those industries where little loss or gain is noted in inputs and outputs, it may make very little difference whether production takes place near the raw material source or near the market. For example, oil refining has plants located both at the market and at the raw material source. The relative desirability of a given location depends upon a deeper penetration of all cost factors than when a location at the market or at the raw material source is clearly indicated. Undoubtedly, transportation will be high on the list of factors to be examined.

In the United States, freight rates have been a source of vexation for many people. Early railroad rate-making philosophy was based on "what the traffic would bear" rather than on the cost of performing the service. Motor carriers tended to imitate railroad rates. It is only in recent years that the carriers have become interested in cost accounting and the desire to set rates based on operating costs. However, the philosophy of rate discrimination still prevails. During a recent transportation seminar, representatives of both truck and rail carriers implied that if a business can give them a good volume of traffic, then they will try to obtain for that

business a good transportation rate. Small plants are obviously at a disadvantage in this kind of rate-making philosophy as they will have to pay the posted class rate for their goods.

The practice of "in-transit" privileges in determining rates also affects plant locations. Carriers determine a rate, generally based on the rate applicable to raw materials, that permits raw materials to be processed enroute to the markets and then continue their journey under the same original rate. This system replaces the combination of rates that would otherwise be charged on the shipment and ignores the fact that a stop was made for processing the goods into something more valuable and higher rated. This practice permits plants to be located in-between markets and raw materials. Grain, lumber, livestock, cotton, dairy products, iron, and zinc are but a few of the raw materials enjoying "in-transit" privileges. To the extent that this practice grows in importance in the future, market and resource orientation could diminish in plant location.

Figure 3 showed, for simplicity only, freight rates as being a straight line and dependent only upon distance. Yet for most commodities, total transportation cost per mile decreased as the length of haul increases. Freight moving in certain directions is sometimes accorded rate advantages that are not available to freight moving in the opposite direction. Also rates are influenced by the value added principle, bulkiness of the shipments, and perishability. To the extent that any of the above affect the cost of transportation, it could also affect plant location. Greenhut, for example, states: "Low freight rates (or any lowering in freight rates)

leads to localization in the center, as the hinterlands are more serviceable from a distance. On the other hand, high transit costs (or increase therein) tend to disperse the particular industry."[7] Changing freight rates on grain in the upper midwest area have had the effect of changing some market areas and the direction of some grain shipments.

In selecting locations, some producers have to locate where they can obtain the type of service from their transportation system that they require. Water transportation is cheap but it is slow; air transportation is fast but expensive. Manufacturers of style goods, whose sales depend on getting their goods to retailers with little delay, like air transportation; whereas ore processors, who are not worried much by delivery time, seek the lowest cost transportation system.

As a rule, service and the number of transportation facilities go hand in hand. Thus plants tend to congregate in areas where transportation systems converge. In those areas off the mainline transportation networks, the chances of substantial industrial growth are small, at least until transportation facilities are improved.

When plants produce for several markets or receive their raw materials from several sources, the complexities of choosing a plant location are multiplied. In this situation, appropriate weights must be given to transportation cost and service at all of the various points of supply and demand

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[7]Melvin L. Greenhut, op. cit., p. 261.

in choosing a location. For example, Yaseen demonstrates through the use of a map of a firm's market area how to compute a simple geographic and a weighted center of markets.[8] In weighting raw materials though, frequently alternative sources are available. All sources should be considered in the location decision, as the closest or cheapest source of materials may not necessarily be the best source from the standpoint of the firm. For example, a nearby source of coal may be cheap but have a low BTU rating while a more expensive distant source has a higher BTU rating and would deliver more power per ton at less overall cost.

A good rule of thumb for selecting a plant site is to locate where there is no back haul or at least where it can be kept to a minimum. For example, in Figure 4 raw material is located at point A and the market at point B. It would not be desirable to locate production at point C which would necessitate backhaul to point B. The added transportation cost of the backhaul could have been avoided by locating at points A or B, or somewhere in between.

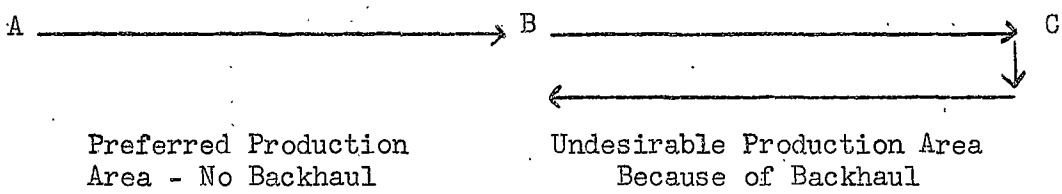

Figure 4 - Backhaul Transportation

[8]Leonard C. Yaseen, op. cit., p. 20.

Labor

It is a rare plant where rates, availability, stability, and productivity of labor are not vital factors in its operation. As automation progresses, machine repair or fuel might supplant labor to a great extent. Currently, however, labor is still a major cost item in most production processes; and if the above characteristics of labor are not favorable, then the future industrial growth of an area is somewhat in doubt. Usually, though, there is ample public information available for judging these labor factors in almost every area.

In the United States there are wide variations in labor rates. It has been argued in recent years that wage differentials would disappear primarily because of labor unions and the growth of national bargaining. This does not seem to be the case. Miller states: "The geographic spread in wage rates is as great at present as in any previous period."[9] There are many reasons to account for this difference in wage rates and among them would be cost of living, sex and color of the work force, skill of the workers, and type of industry.

Yaseen feels that a "most important influence on wage rates is the expenditure standard of a community."[10] He points out that there is little difference in food costs between areas but major differences exist in "buying habits" and in the "tempo of spending." Rural communities have less

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[9]Willard E Miller, A Geography of Manufacturing, p. 7.

[10]Leonard C. Yaseen, Plant Location, p. 69.

purchased entertainment than larger cities so presumably spend less. Those living in the South pay less for heating than those in the North. As long as these or other differences in spending exist, or are thought to exist, some wage differentials will probably also exist.

With the passage of the Fair Employment Practices Act, wage differentials based on sex and color should diminish. Within each plant, equal pay is required for the same type of work regardless of which sex or color is doing the work. Skill of workers and the type of industry should continue to be important reasons for wage differentials. For example, in the 1958 Census of Manufactures the United States average wage for labor in petroleum and coal products division was $2.97 per hour; in textile products the labor averaged only $1.50 per hour. Most of this difference can be attributed to differences in skills but some is inherent in the industry itself.

Some of the differences in wage rates can be traced to the productivity of the workers. Where capital investment per worker is high, wage rates also tend to be high, reflecting the greater skill required by the employees to operate the plant. Where capital investment is low, the wage rate tends to be low, indicating that less high-paid skilled labor is required. This latter type is called a "labor intensive" industry whereas the former is called "capital intensive." To show how important it is to consider not only labor rates but also productivity, Wonnacott compared the rubber products industry in Michigan and Minnesota and found a 30 percent difference in the wage rate ($2.63 in Michigan to $2.02 in Minnesota) but only a 4

percent difference in total costs.[11] Productivity, however, is not entirely due to the amount of capital investment. Some workers and even some social groups have more abilities for industrial work than others. Women, for example, are thought to be better suited for repetitive operations than men, hence their productivity, ceteris paribus, would be higher.

Although the U. S. labor force is considered to be fairly mobile, as a practical matter when selecting a site it is desirable to make sure that labor in a desired quantity and quality is available within the immediate vicinity. Skilled labor is generally considered to be more mobile than unskilled but even here a generalization of this kind could cause difficulties. An article in the February 23, 1966, issue of the Wall Street Journal pointed out the difficulties firms were having in getting employees to move to new locations. In most cases, all or a majority of the labor force should be counted on as coming from the immediate vicinity of the plant site. An exception might be where a company is transferring operations from another site; here the company might bring all or a majority of its employees with it. (As an aid in assessing labor supply, most State Employment offices have information that can be used to compute labor quantity and quality.)

It is sometimes difficult, when assessing labor supplies, to compute the number of job transfers that will occur if a new plant locates within a given area. Wage rates and working conditions of the new plant in comparison

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[11] Ronald J. Wonnacott, "Manufacturing Costs and the Comparative Advantage of United States Regions," Upper Midwest Economic Study, Paper No. 9, April 1963, p.11.

with those prevailing in the surrounding area would be of major importance in estimating job transfers.[12]

Stability of labor is also of importance when selecting a plant site. Workers can become accustomed to seasonal employment and unemployment checks and hence not be interested in year-round employment. Agricultural workers might be enticed to industry during the winter months but leave again for agricultural work during the summer. Labor strifes can also become so pronounced in an area as to make it unwise for new facilities to locate there. Indications of labor stability can be obtained by looking at employee absenteeism and labor turnover. Yaseen feels that an absentee rate of more than 3 percent is excessive and a danger signal.[13] However, a high employee turnover is an even greater indicator of labor unrest, particularly if the industry has high employee training costs.

A review of state labor laws is sometimes helpful in determining the labor climate. If labor is strong and has been successful in getting stringent labor laws passed, these may hamper operations. On the other hand, where labor is weak and few labor laws have been enacted it may be a sign of

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[12]This author is acquainted with a situation where a new facility, primarily employing women, practically destroyed an existing community wage rate for women. A large number of women in the community changed jobs because the wage rate paid by the new firm was higher than that existing within the community for female workers and because at the time of the establishment of the new plant there was not an excess of unemployed females with the desired skills in the area. A wage spiral resulted that was unhealthy for all firms in the community. If the new firm had paid a competitive community wage and if they had determined the availability of labor with the right kinds of skill, probably this situation could have been avoided.

[13]Leonard C. Yaseen, Plant Location, p. 73.

future labor problems if and when labor gets more power. In other words, locators want to see the right mixture of the right kind of labor laws.

Can labor costs rule out locations? The answer would have to be a resounding yes as the following quote indicates: "Climate has ruled New England out of the running and high costs of labor and steel have pretty well eliminated the West Coast. . ."[14]

In summary, when labor costs are an important part of total production and distribution costs, then the selection of a plant site where favorable labor costs exist is important. In determining labor cost, not only should the basic rates be considered but also the indirect or fringe benefits accorded to labor as well as the productivity and stability of the labor supply.

Care should be exercised that availability of labor be considered as well as cost. The labor supply should be adequate in both quantity and quality in reasonably close proximity to the proposed plant site.

Power

Historically, the location of power resources has been one of the major factors in determining the location of industry. Because water power was the chief source of mechanical energy for many years, it was only natural that industry located close to water resources. However, in recent years the development of steam generating plants using coal, oil, or natural gas

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[14]Wall Street Journal, July 28, 1966, p. 1. The quote was in relation to the building of a new shipyard for the navy.

along with the ability to transport power over long distances have lessened the dependence of plants to sites near water. Coal and other energy sources are generously scattered throughout the United States so that steam generating plants can operate economically from almost any location. Water power, though, is usually less expensive than other energy sources.

A costly but relatively untapped source of power is nuclear energy. About half of the total power output of new generating plants ordered in the first half of 1966 was scheduled to use nuclear fuel, and the Atomic Energy Commission now estimates that by 1980 nuclear energy will provide about 20 percent of the total estimated consumption of electricity.[15] Although most of the development of nuclear energy has been subsidized by the Government, perhaps development will be such that the ease of providing power from this source (portable units have been developed that can be located almost anywhere) will revolutionize plant location in those industries dependent upon large quantities of power. For example, the electrochemical industry has traditionally located near low cost water power. If nuclear power becomes competitive with water power, then the electrochemical industry would be free to locate away from water power and nearer markets.

Because power supplies are available almost everywhere, it is usually a matter for a firm to determine if existing sources are adequate for its needs at a price that is reasonable. Rates are available from State Utility Commissions; but in case of heavy usages, rates are usually negotiated

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[15] Wall Street Journal, August 1, 1966, p. 1.

directly with the supplier. However, for most industrial plants, published rates are sufficient and in these cases power is probably not an important factor in plant location.

Fuel

As a locational factor, fuels vary greatly in importance from industry to industry. In those industries where large quantities of fuel are used, fuel could possibly dictate a location closer to it than to either raw materials or markets. For example, orientation to fuel in considered a major factor in the location of such industries as steel and glass making. (Although recent technological developments in steel have now lessened the importance of fuel as a factor of location.)

Improving transportation systems have also tended to lessen the importance of fuel as a factor of location except in those cases where fuel is a major cost item and alternative fuels or sources are available. Securing the fuel with the lowest delivered cost and highest energy output could give preference to one location over another.

Water

For most industrial plants, usage of water is limited to drinking and toilet purposes and thus water is not a factor of location. To that minority of plants (about one-fifth) that use water in their production processes, the securing of necessary quantities and qualities of water has become an increasingly important factor of location. Some new industrial techniques, as well as many older processes, require vast amounts of water at reasonable

rates that many communities simply cannot supply and thus have to be eliminated as possible locations. In many steel, paper, food, and chemical plants, water is a key determinant of plant location.

Areas where periodic water shortages occur are not desirable locations when water is necessary in the production process. If shortages do occur, the normal order of priority is domestic and sanitary first, agriculture second, and industry last. It is better to locate where supplies are adequate than to run the risk of plant shutdowns. Many firms attempt to solve their water problems by drilling their own wells. A danger here is that more and more states are regulating ground water in the same manner as surface water. Hence, new wells may not be permitted at all locations or supplies could be curtailed if the ground water is reduced to certain levels.

In most processes where water is important, the quality as well as quantity is important in choosing a location. Contaminates or excessive minerals may require early replacements of some equipment or perhaps the installation of added equipment (for example, water softners) to handle the poor quality water. In any case it would be adding costs to the operation of the plant and it is something that might have been avoided if an alternative location had been selected.

Wastes

One of the most widely discussed subjects in recent years is that of waste disposal. Billions of tons of waste pile up or are emitted into the air or water each year. The finger of suspicion points to industry as one

of the leading offenders, although it has been estimated that close to 90 percent of all manufacturing plants in the United States are not capable of air and water pollution. The Department of Interior Conservation Yearbook No. 2 estimates that only about one-sixth of the air pollutants arise from manufacturing. However, in some industrial processes the problem of waste is a major problem. Many governmental units have passed laws or ordinances in an attempt to eliminate or reduce the problem. For example, if a smog alert is called in Los Angeles, then certain industrial processes have had to curtail their operations until the alert ended.

For the vast majority of firms, the problem of wastes is not a factor of location. For the minority of firms where it is a problem, location can frequently minimize the cost of controlling it. The direction of prevailing winds, stream flow, and the size of dumps along with the amount of wastes expected to be dumped by the new plant, should be considered in selecting the plant location.

Climate

In selecting industrial sites, warmer areas have a comparative cost advantage over colder areas, ceteris paribus. Not only are plant heating costs lower but workers need less money to maintain comparable living standards. Miller has estimated that "a southern industrial worker, in order to have the same level of living as a worker in New England, can have a salary 10 to 20 percent lower."[16] Also in southern areas, buildings can frequently

[16]Willard E. Miller, op. cit., p. 10.

be constructed at less expense than in the North where buildings must be constructed to keep out the harsh cold weather.

It was once thought that the productivity of workers in the warmer areas was lower than in the colder areas. Greenhut investigated available evidence in this area and concludes that this is not the case.[17] Productivity, using similar economic resources, seems to be as high in the South as in the North.

In terms of a good working climate, Yaseen has suggested the following:

1. The location should have frequent but moderate weather changes and gradual seasonal changes so as to prevent weather monotony.
2. The temperature range should be approximately 40° during the winter season and 64° in the summer.
3. The humidity should not be too low. Below 25 percent relative humidity promotes susceptibility to the common cold and other respiratory diseases.[18]

Unfortunately there are few areas that meet these kinds of climatic conditions; fortunately not all industry needs them. Each industry has a climate that is best suited to its needs. One firm might need a damp climate, another a dry one; some perhaps need lots of sunshine, others not so much; some might desire a warm climate, while others need cold climates. The point is that it takes all kinds of firms seeking all kinds of climates to make up the industrial complex that we have in the United States. However in location analysis, it must be recognized that climate can have an

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[17]Melvin L. Greenhut, op. cit., pp. 130-131.

[18]Leonard C. Yaseen, Plant Location, p. 125.

influence, direct and indirect, on costs of production.

As an aid in selecting the right climate for a plant location, the U. S. Weather Bureau compiles data for almost every area. This data includes information of elevation, temperatures, precipitation, relative humidity, number of sunshine hours, wind speed and direction, and the number of days per year of each kind of weather, i.e., clear, cloudy, snowy.

Capital

Most writers agree that capital is not an important factor of location. For example, Miller concludes:

> The important manufacturing districts of the world in modern times are located with little regard to a source of money for their development. Capital is readily available to all parts of the world where political security and financial returns are reasonably guaranteed. As a consequence, capital as a location factor may be disregarded in the industrial nations of the world.[19]

Certainly one cannot argue with this in considering the location of large firms. Their capital is not tied to local or regional money markets but rather to national and international money markets.

The business structure is not composed entirely of large firms. A substantial number of firms that would have to be considered small are still in existence. They are local in nature and their impact on the markets is infinitesimal. The location of these small firms may not be dictated so much by the need to secure a low cost operating site as it is by the need to secure capital. Their sources of funds are generally limited to personal

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[19] Willard E. Miller, op. cit., p. 10.

savings, friends, relatives, acquaintances, local banks, industrial development groups (in the few areas where these have been formed), and to some government sources, notably the Small Business Administration. By the very nature of most of these sources, these small businesses are tied to locations approximate to where they obtained their capital. Thus capital, in this situation, could become a dominant factor of location. (However, it would have to be conceded that the mortality rate of these firms is probably a lot higher than those where capital is not an important factor of location.)

Land and Buildings

Wars, people, and inflation have had their impact on land and building costs throughout the United States; but not all areas have been affected to the same extent. A few hundred miles, or in some cases just a dozen or so miles, can change land and building costs by thousands of dollars. When industry contemplates alternative locations it is acutely aware of these differences that exist in land and building costs.

More than one enterprising mayor or chamber of commerce official has killed a plant location because of premature announcements. These announcements have led in some situations to severe inflation of land prices. This in turn has led the firm to re-evaluate locations and to select an alternative site where land and building costs were more reasonable. People like to get the best price for their land and are of the opinion that industry has unlimited funds and can pay any price. What these landowners frequently

forget is that industry is composed of people who also want to obtain the best price possible--in this case the lowest one. Where substantial land area is being sought, industry will go to great lengths to maintain secrecy. Civic leaders would do well to abide by that secrecy until after the land has been acquired.

One of the more interesting developments of industrial land acquisition is the practice of firms buying land in advance of need. Of course, not all firms follow this practice but to the extent that it is being practiced indicates that decisions are being made now concerning industrial locations for the future. The reason often given for these acquisitions is to acquire low cost plant sites in strategic locations. (Although these acquisitions could be sold at some future date, a study of the extent that these are being used for future locations could, perhaps, give an indication of the future direction of industrial growth in the United States.) At any rate, to those firms acquiring this land, it would have to be considered as a factor of location although probably not a primary one.[20]

For firms not interested in buying an industrial location, their consideration of locations is limited to areas where rental or lease arrangements can be obtained. Because suitable facilities are probably available at many locations, the terms of the arrangement would be a consideration in selecting a site. Frequently, renting facilities instead of buying can help in trying out an area without committing one's capital to permanent

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[20]For a more complete discussion of firms buying land in advance of need, see Wall Street Journal, December 18, 1965, p. 1.

facilities. Communities should be wary of giving too many short-term special considerations to firms trying out an area. Such firms are an easy target for other communities once these special considerations end.

Taxes

The influence of taxes in selecting plant locations is difficult to determine. Not only is there a lack of uniformity in assessing taxes throughout the states so that it is difficult to compare tax burdens, but also those people studying location factors cannot agree as to how important taxes are in selecting locations. Depending upon which author one reads, one can get viewpoints ranging from those who argue that taxes are important but not a dominant factor to those who feel that taxes are unimportant.

Questionnaires sent to businesses in the early 1950's indicated, generally, that little weight was given to taxes in selecting locations. However in 1964, the results of a questionnaire sent to subscribers of Business Week by the publisher, McGraw-Hill, showed that 65 percent of the 2,000 respondents felt that "reasonable taxes" were important in location decisions. Does this mean that industry now feels that taxes are an important determinant? McMillan stated: "Primary among the areas of initial investigations is government finance and taxation"[21] Yet the results of a 1966 survey reported in Factory showed less than 12 percent rated low taxes as being one of the top five location factors.[22]

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[21] T. E. McMillan, Jr., "Why Managements Choose Plant Location vs. Determinants of Plant Location," Land Economics, Auguse 1965, p. 244.

[22] "Procedures for Contemporary Site Selection," Factory, May 1966, p. A-136.

Apparently, though, some states have been impressed that taxes are an important factor in industrial location. Thirty-five states have enacted "free port" laws to reduce property tax on inventories (primarily those destined for later out-of-state shipment), ten states offer general property tax relief on new investment, and twenty-three states offer some kind of tax exemption or concession to industry.[23] Seemingly, the legislators in these states have been convinced that these concessions would help to stimulate industrial growth and development.

Empirical studies seem to indicate, though, that taxes are not important in choosing general areas of location but are one of the several factors considered when choosing a specific site from the already determined general area. For example, Greenhut concludes the following from his review of empirical studies:

> From these studies, it would seem that tax incentives are at best a relatively unimportant secondary factor of location. Given the governing factor, the tax incentive may induce a specific location within the area defined by the basic factor. If the location offering tax incentives is not within the area set by the governing factor, it is simply not considered."[24]

Industry is willing to pay its fair share of taxes but it does not want

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[23]Information obtained from "State Tax Guide," Prentice-Hall, Inc., p. 277 (April 26, 2966) and p. 279 (January 18, 1966). In addition, nine states have state development authorities that will build new plants or finance construction, twenty-seven states have state development credit corporations that aid in financing new plant construction, sixteen states have laws that allow governmental bodies to sell bonds to cover the cost of erecting new plant facilities, and thirty states offer some type of 100% financing plans on new plant construction.

[24]Melvin L. Greenhut, op. cit., p. 139.

to pay an unreasonable amount. Thus when Factory listed "low taxes" and the Business Week questionnaire listed "reasonable taxes," the difference in response could have been due to the use of the words "low" and "reasonable."

Low taxes have probably eliminated as many locations from consideration as would high taxes. Low taxes can be a sign of inadequate present services and possible future troubles. A community may have to play "catch up" with substantially higher taxes at some future time. The following points are suggested as items to consider in comparing tax burdens:

1. What is the net debt and its trend?

2. What changes have taken place in interest rates?

3. What community facilities (schools, city buildings, sewers, etc.) are now inadequate or will be in the immediate future and what is their estimated impact on future taxes?

4. What are the capabilities of tax officials and their attitudes toward industry? (Industry is still considered fair game in many tax assessor's offices.)

Taxes are in essence a measure of the services of the community and the state. As demands for increased services are made upon the governmental bodies, it is to be expected that their reactions will be different. The extent of this difference will be reflected in taxes and perhaps increase existing tax disparities. As these tax disparities grow so will the importance of taxes as a factor of location grow. For example, Yaseen compared tax burdens for a hypothetical business in nine locations each in a different

state. He found a tax spread among the nine locations of $231 thousand.[25] Impressive as this difference is, it must still be measured in terms of benefits received.

In summary, it is not only taxes that should be considered but also benefits received. That location, ceteris paribus, providing the better services for the lowest tax burden would be selected. Taxes, in most site selections, are probably only secondary factors of location rather than primary.

Personal Factors

Probably no factor of location is as difficult to assess or more bothersome to community development efforts than are the so-called personal factors of location. An investigation might reveal that demand and cost factors are highly favorable at a given location, yet the plant locates somewhere else. Or perhaps demand and cost factors seem unfavorable but the plant locates there anyway. Why? The reason is almost always due to some personal factor on the part of the person making the location decision. Such reasons might include living or social conditions or perhaps recreational possibilities. Little has been done to incorporate these personal factors into location theory because of their variability. They are unlike demand or cost factors in that they are almost impossible to quantify; however, on occasion, they have been important determinants of location. A discussion of some of the more important personal factors follows.

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[25]Leonard C. Yaseen, Plant Location, p. 108.

Recreation

The affluence found within the United States economic system is unsurpassed by any other nation. Along with this affluence is the demand for greater and more diversified recreational activities. Statements such as "I located here because of the fishing" or "I wanted to be near the Los Angeles Dodgers" are statements that reflect the attitudes of those making location decisions toward recreation. A town in Tennessee was told that although it was one of two being considered as a plant site, it lost out for the reason that "If you want to attract industry you gotta have a golf course."[26] Also an Ohio community was eliminated from final consideration because it not only lacked a golf course but also considered inadequate were its parks, playgrounds, social and cultural centers, churches and schools.[27]

A noted conservationist, author, and lecturer, E. H. Taylor, in speaking to a statewide industrial development group in Pennsylvania, is reported to have said: "The shortage of recreational resources is just as serious as the shortage of water."[28]

Another, Fred Smith, concludes: "What interests young people as well as older people are recreation facilities. What attracts them are recreational facilities. What makes them happy in a given area is likely to be,

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[26]"You Gotta Have a Golf Course to Attract Industry," Business Week, June 25, 1955, p. 87.

[27]William Papier, "Recreational Facilities Attract New Industry," The American City, July 1957, p. 131.

[28]Ibid, p. 132.

in large part, recreation facilities."[29]

The above quotes are not to imply that all industry demands or even wants recreational facilities. Some firms could care less. However with the trend toward more leisure time, recreation will become increasingly important in location decisions. An official of Sylvania Electric sums up this increasing concern for recreation facilities when he stated: "Employees, we feel, should have wholesome recreation available for their leisure time..."[30]

The community that can provide this wholesome recreation will be preferred, ceteris paribus, over one that does not provide it. Quantity may count but quality will usually be the deciding factor.

Social Conditions

Integration of an industry into a community is a two-way street. Not only must the community express its approval or disapproval but industry must also assess its relationship within the community. Some companies will not select areas where they are the major employer; other companies feel that there is a definite advantage in being the big industry in an area. There is at present, however, a trend toward locating plants in smaller communities. It has been estimated that in recent years 90 percent of all new factories have been built in communities of less than 50,000 population[31]

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[29]Fred Smith, "Recreation as an Economic and Social Asset," Recreation, May 1961, p. 229.

[30]William Papier, op. cit., p. 131.

[31]"Why Big Industry is Going to Smaller Towns," U. S. News and World Report, December 21, 1959, p. 87.

and that by 1970 nine out of every ten plants will employ less than 100 people.[32] With this kind of trend it becomes increasingly important to determine whether the plant and the community can successfully integrate. For example, a plant dependent upon continuous seven-day operations may find itself in trouble by locating in a strong religious community where Saturday or Sunday work is frowned upon.

Regardless of what the plant site advertisements state, it must be recognized that not every plant can fit into every community. Industry is recognizing this and is now giving more attention to social conditions as a factor of location.

Living Conditions

Living conditions within an area can and do affect the location decision. A situation was mentioned where both a demand and cost analysis favored a certain location, yet the president spurned it when he learned that the climate would have an adverse effect on an allergy problem in his own family.[33] A company in Phoenix, Arizona, boasted that unsolicited letters are received from all over the country asking for employment because of the desire to live where it is sunny and dry.[34] If this is true for some potential employees, no doubt it is also true for some employers.

The pace of life is considered to be slower and more casual in the West

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[32]Wall Street Journal, September 4, 1964, p. 15.

[33]T. E. McMillan, Jr., op. cit., p. 246.

[34]Reported in the Wall Street Journal, May 6, 1965, p. 1.

than in the East. This appeals to some who make location decisions whereas the western style of living would be repugnant to others. Some, perhaps, would like to be located in areas of dense populations but others would prefer the wide open spaces with room to breathe. Also, as mentioned earlier, some companies have had to cancel relocation plans because they could not convince key employees to move with them. The employees preferred the living conditions of the old area over the new one.

Living conditions vary somewhat between communities, even those located reasonably close to each other. What makes a person choose one community over another? Perhaps the sociologists will arrive at the complete answer. For purposes of examining factors of location, it is one of the many intangible factors that could explain the selection of one site over another.

Educational Facilities

Like most of the other personal factors of location, the influence of educational facilities on location is difficult to determine. It is suspected, though, that for the majority of plants its influence on location decisions is small. For other plants it could be one of the more important factors. For example, a trend observable in recent years is that of locating research and development facilities in proximity to colleges and universities. Not just any school, however, but generally those specializing in such areas as engineering, physical and biological sciences, and agriculture. Other plants have found it expedient to locate near trade schools to insure an adequate supply of skilled craftsmen or perhaps close to good libraries

where company personnel have access to the latest technological information. The president of one firm, a staunch Catholic, refused to approve a location because it lacked parochial schools.

Other Personal Factors

Besides those discussed above, there exist a host of other personal factors. These include such things as adequacy of room accommodations for customers, visitors, or plant officials, the kinds of stores or shopping centers within or close to the proposed location, adequacy of hospital facilities, community planning efforts, progressiveness of local school systems, street lighting, condition of streets, and the quality of newspapers, radio, and television serving the area. Most are probably not primary location determinants but could have some affect on the ultimate decision.

Summary

An area may be ripe for industrial development but none comes. Community attitudes and cultural patterns may be preventing the establishment of the environment necessary for development to take place. Or perhaps the person making the decision for industry has found, in his assessment of the community, factors not to his liking. Both of these comprise the personal factors of location.

It is difficult, if not impossible, to determine the personal factors that are going to be important in any given location decision. There is ample proof that they do affect some location decisions. Those communities interested in industrial development can help themselves by giving industry

as favorable a picture as possible. Golf courses, fishing streams, opera, and well-maintained roads are not the solution to industrial development in every area, but having them is certainly not hurting a community's chance of securing industrial development.

Governmental Factors

Another intangible factor usually examined in site selection is the role of government in and its attitude toward business. Some assessment needs to be made of the business climate at all levels of government within a state. Such an assessment should include some measure of each of the following: the effectiveness of the government; the types of laws considered and passed; the types of taxes assessed and reports that need to be filed; types of restrictions imposed against business (such as zoning laws); the kind of benefits received from the governments (such as police and fire protection); and some indication of the attitudes of people toward their governments.

Many governments have failed to realize how important it is to project a good image toward business. This image cannot be created by simply putting on a one-day show. Rather it is something that is developing with each passing day. Too frequently it can be observed that local communities roll out the red carpet one day only to have it stored away for the other 364 days. These governmental units have to recognize that something done today, or tomorrow, or the next day (such as a careless word, an unfavorable zoning restriction, or perhaps the passage of a law favoring union organization)

can have an impact on industrial development for years to come.

Summary

In every site selection, a balancing and weighing of many different factors is involved. Some factors will be deemed to be very important and will weigh heavily in the decision; others will be considered of less importance and accorded little weight in the decision.

Normally cost factors have had the most influence in location decisions but certain trends are evident to indicate that demand will exert an increasing influence in location decisions. Instead of business seeking the least-cost location, the stress is now on a maximum-profit location.

Tempering the stress toward a maximum-profit location will be the personal and governmental considerations. Although they are difficult to quantify, their influence in location decisions must be recognized and appropriately handled.

The job of luring industry into a state or community is not an easy one. The many location variables, along with different needs of plants, creates many different patterns of location factors none of which is just exactly like the other. Perhaps to the plant, investigating locations is a science; to those attempting to stimulate industrial development, it would have to be classified as an art.

> . . . It seems to me that Montana is a great splash of grandeur. The scale is huge but not overpowering. . . . Montana seems to me to be what a small boy would think Texas is like from hearing Texans.
>
> John Steinbeck

Chapter III

CHARACTERISTICS OF MONTANA AFFECTING INDUSTRY

Introduction

The purpose of this chapter is to point out the characteristics of Montana that affect industrial growth and development. The intent is not to re-do the many books, pamphlets, and articles containing the history and geography of Montana but only to highlight some of the main characteristics of the State that will affect industrial growth and development. One can begin to understand the future of industrial growth only by understanding the environment where it is to take place.

General Characteristics

Montana is a land of contrasts in altitude. The western one-third of the State is traversed from north to south by the Rocky Mountains. Some of these mountains are over 12,000 feet high, but most are between 8,000 and 11,000 feet. In between many of these mountains are located valleys that have altitudes that range between 2,000 and 5,000 feet. It is in these valleys that many of the State's important agricultural centers are located. Also these valleys are generally well supplied with rich soil, abundant water

(surface and ground), and are protected from the winter storms by the near-by mountains.

The eastern two-thirds of Montana is labeled as a plains area. This area is not devoid of mountains as isolated mountain groups appear throughout. However, the average altitude of this area is substantially lower than that found in the western one-third of the State.

Although Montana is classified as a mountain state, more than half the State is below 3,000 feet in altitude. In fact Montana's average altitude of about 3,400 feet is lower than the average altitude of most of the other Rocky Mountain States including Arizona.[1] The visitor from the East is often surprised by this fact as he drives over the many miles of plains to reach the mountains.

The total area of Montana is 147,138 square miles of which 1,402 square miles are covered with water. The state has a population density per square mile of 4.9 and ranks 47 out of 50 states in this category. Only Alaska, Nevada, and Wyoming have lower population densities than Montana. Thus, the State has ample room to grow population wise.

The weather in Montana is extremely variable yet it is rather pleasant. The average maximum daytime temperature for January is 28°F and for July it is 85°F. As a rule, however, these averages would be higher in the plains and lower in the mountain areas.

In terms of sunshine, Montanans enjoy a high average percentage of

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[1] "Natural Resources of Montana," op.cit., p. 10.

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