

THE EFFECTS OF ISOLATION ON AGRICULTURAL DEVELOPMENT

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-soil types, road conditions, urban places

CHAPTER 1

INTRODUCTION

Agriculture, as with any human activity, is subject to an extremely wide range of influences. This gives rise to complexities of a rather broad scope which must be dealt with when investigating the agriculture found on any scale, be it farm, county, province, or country. In any study on agriculture, these complexities must be reduced somehow so that the scale of investigation allows enough in-depth study to permit reliable conclusions. The purpose of this study is to investigate the effects of one factor, isolation, on agricultural development. Let it be hypothesized that: "Isolation of an agricultural area will affect: i) the rate and nature of growth, and ii) the present agriculture".

Thorough investigation of the effects isolation has will indicate more than just these effects. Causes may be suggested. These results may be related to economic, political, or other such processes which have an association with isolation. As well, the extent of the effect should be found. In establishing 'what' (these effects), 'why' (the causes) and 'how much' (the extent) will also be shown.

Agriculture can be examined from the standpoint of inputs and outputs. Dr. H.A. Wood summarizes the inputs affecting agricultural land use as follows:

PHYSICAL:	geology	gg
	geomorphology	gm
	landforms	lf
	relief	r
	slopes	s
	soil conditions	cs
	potential productivity	pp
	stream flow	sf
	groundwater supply	gw
	climate	c
	natural vegetation	veg
HUMAN:	size of unit	us
	tenure system	ts
	economics of production	ep
	economics of distribution	ed
	labour supply	l
	market structure	m
	social capital	sc
	disease	d
	education	ed
	government policies	gov't

1.

Using the initials given them, we have the following production function:

$$\text{Production} = f(\text{gg, gm, lf, r, s, cs, pp, sf, gw, c, veg, us, ts, ep, ed, l, m, sc, d, ed, govt})$$

To study production in terms of each influence is a Herculean task. This difficulty is accentuated when one realizes that the factors themselves are inter-related. For example, geomorphology influences relief, slopes, soil conditions, hydrology, size of unit, etc. Education affects size of unit, land tenure, economics of production, etc. This demonstrates that the scope of any study must be limited.

To study isolation, which influences several of the factors here, the following methodology was used.

1. Footnote references are located at the end of each individual chapter.

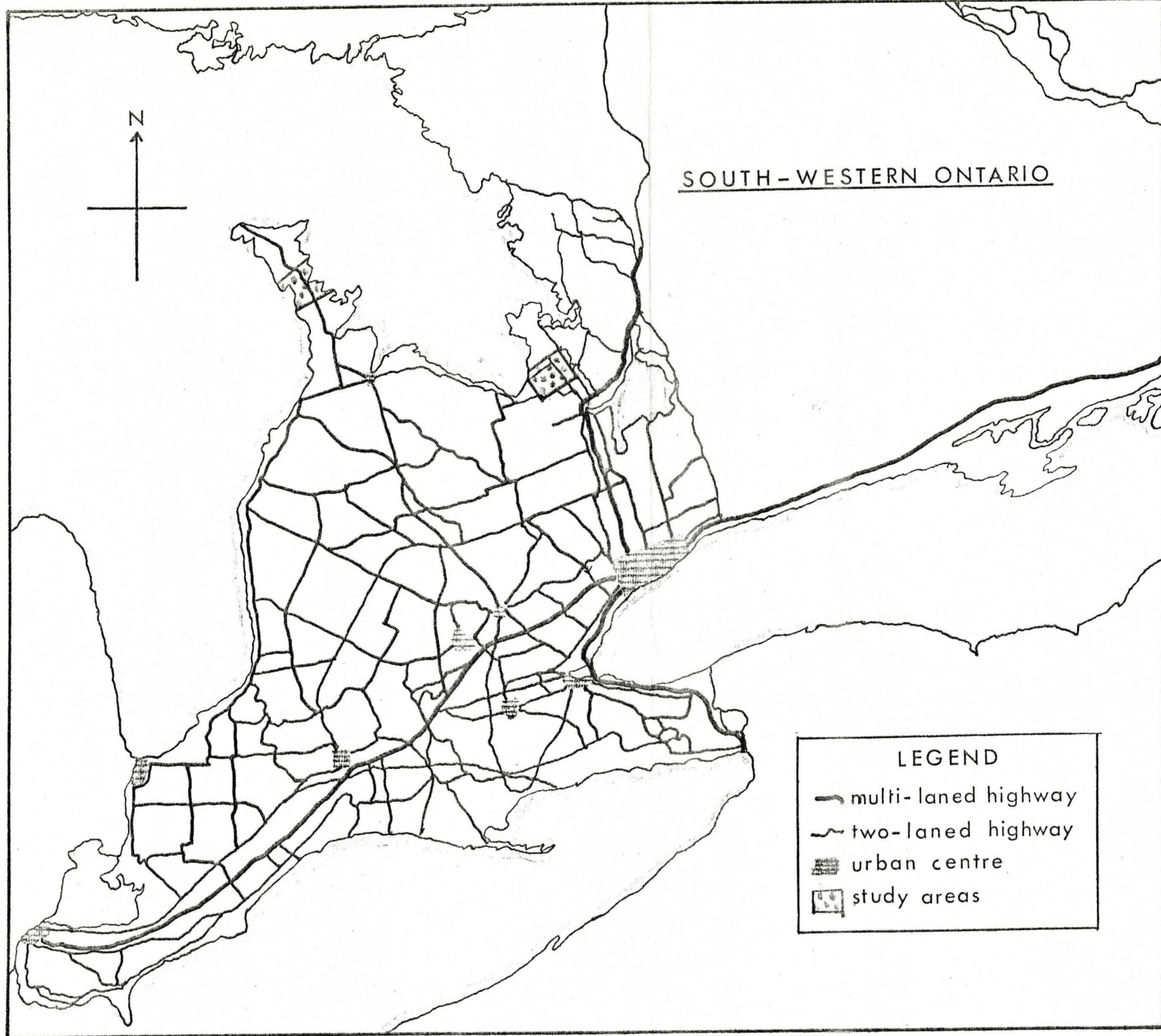
Two agricultural areas were selected which had similar resource bases but which differed greatly in location. One was accessible while the other was isolated. The problem is to assess the significance of isolation to agricultural development.

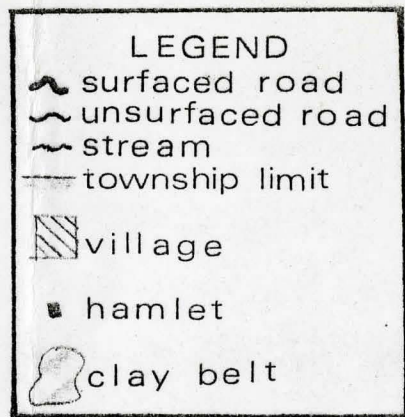
The Lion's Head Clay Belt was selected as a good example of an isolated area. It is located approximately half way along the length of the Bruce Peninsula, which divides Georgian Bay from Lake Huron. The other area is located in Flos Township, in Simcoe County. This is the region between Lake Simcoe and the western shore of Georgian Bay, seventy miles north of Toronto. This area is the Elmvale Clay Plain. Elmvale and Lion's Head are the villages located in the respective areas.

Production differences between the two areas will be due, in part, to this difference in location.

FOOTNOTES








1. Wood, H. A. , "A Land Classification For The American Tropics"; Natural Resources Unit; Pan American Union; Washington, D.C.; p. 4.



EASTNOR TOWNSHIP



LEGEND

- | | | | |
|---|----------------|---|-----------|
|  | surfaced road |  | village |
|  | unsurfaced rd. |  | hamlet |
|  | stream |  | clay belt |
|  | township limit | | |

FLOS TOWNSHIP

CHAPTER 2

THEORETICAL CONSIDERATIONS

Before beginning the study of the actual factors of production, it will be interesting and helpful to review some of the relevant theory. In this rapidly expanding industrial world, there is growing concern about the locational aspects of economic activities. Much of the resulting theory applies to industry and manufacturing. However, there is a significant body of theory which is used to explain the existing patterns of agricultural land use. A resumé of this will provide a theoretical base on which the specific factors involved in production in our two areas can be evaluated.

The dominant work on the location of agricultural activities seems to be that of Van Thünen. Most later theory uses his results as a base, and investigates one or another of the factors which he controlled through assumption, but which in the real world, are not so easily delimited. He proposed an isolated country occupying a level plain with uniform agricultural characteristics. A central city provided the only population cluster and market. Transportation and communication were equal across the plain.

According to his views, "the spatial pattern of agricultural production results from a process of competitive bidding

among prospective rural land uses for occupancy of a given site. That type of production which is capable of yielding the highest net return per unit of land on a particular parcel of ground will make the highest bid for the use of that plot".¹ Calculations are based on net return per unit of land. Differences in net return are therefore the result of transportation differences. Product prices are determined in only one market; therefore income would be the same, wherever the crop was produced. Production costs are equalized by the assumption that the area has uniform agricultural characteristics. The only factor cost which varies over the area is the cost of transporting the product to market. The land nearest the market, with lowest transport costs, will be taken by the types of agriculture which use very intensive methods.

Edgar M. Hoover expands the concept of different rents for different sites. He states that "competition for land tends to distribute various types of land use in such a way that each site is occupied by the use that can earn the highest rent there."² Sites may have two types of advantages: in transfer costs, which are related to accessibility, and processing costs, which are related to the physical character of the site.³ Using Von Thunen's assumptions, it follows that the site with transfer cost advantages will attract the use that earns the highest income.

Von Thunen proposes a series of rings of production, each ring having a different use based on the net return for the product -ie.- income minus costs. The relationships between yield (intensity of use), costs, and income are explored by Edgar S. Dunn. He devised a formula to actually calculate economic rent, the determinant of land use in Von Thunen's model:

$$R = E (p - a) - Efk$$

R = rent per unit of land

E = output per unit of land

p = market price per unit of commodity

a = production cost per unit of commodity

f = transport rate per unit of distance for unit of commodity

k = distance to market.⁴

After consideration of his rings, as applied to Germany, Von Thunen proposed that the technique could be used to explain agricultural patterns elsewhere. However, he also recognized that his assumptions often did not apply to the real world situation. He considered each, and modified the theory as the limitations were each made less restrictive. Others have expanded greatly these concepts, but Von Thunen's analysis, in general, is adequate for our purposes.

He first considered the effects of unequal transportation costs. By adding one improved route - waterway, road, etc., he showed that the farmers located closest to that route derived the greatest benefit from the reduced costs. His rings therefore become stretched along the route to form a series of concentric ovals. Areas at the 'ends' of the ovals

were able to offset distance costs because of cheaper transport rates than areas closer to the market but not close to the improved route. In the original model transport costs were directly related to distance. Here the mode of transport has been introduced. It too affects economic rent, through transportation costs. Other recent developments in transportation costs are explored by Hoover.⁵ Detailed explanations of the effects of such factors as freight rates, terminal locations, etc. are found in his book, but need not be included in this brief summary. One of his conclusions deserves mention. He claims "For sustained economic progress, a region needs improved transfer facilities and a shift to more and more intensive forms of production."⁶

Others who have studied transport costs find that Von Thunen's conclusions are acceptable. One concludes that "To obtain a complete understanding of a location problem, the nature of the effects of distance must be appreciated. Though in some cases, it may not be very important, it usually has a considerable influence, and is often the dominating consideration".⁷ Concerning transport costs then, the universal variable is distance. Method of transport is also important in a majority of areas. The third influential factor is level of development of the transport system." When the major highways and railroads around central markets are not interlaced with systems of connecting roads, the

by-passed areas often continue to suffer because of their relative inaccessibility".⁸

Von Thunen next considered the effects of added urban centres. These each developed the zonal pattern of the original one market economy. The size and shape of the zones was influenced by the size of the market, and distance from other markets, as well as the transport costs, etc. which applied to the original model.

Next in the list of assumptions which Von Thunen dropped was that of equal production costs. Differences may be due to the factors given by Wood. In general, a decrease in production costs results in a widening of the crop-zone. Increased costs create narrower zones. This is tied in with the theory of comparative advantage. An area far from the market can compete with an area near the centre if it produces more cheaply than the inner region. This saving in input costs can be used to offset the higher transport costs caused by greater distance.

This works also in the reverse situation. In reference to areas near the centre, "With their savings in transport costs, they often compete on favourable terms with producers living in areas that boast natural advantages for particular products."⁹ Net return equals income minus expenses. Expenses involve production costs and transfer costs. Savings on one cost offset higher costs for the other. Net return

is influenced by how high and low each saving, or extra cost is.

In reference to technological change, Barlowe points out "transportation advancements... have not entirely wiped out the transport advantages held by lands located close to the centre".¹⁰

Von Thunen also introduced other modifications, concerning taxes, trade, etc. These are complicated, and have widely differing effects. Since they are listed as inputs into the system by Wood, they will be detailed for the two areas later. If they differ, then their effects will be investigated. From a surface examination, they seem similar.

The most significant factor in location determination is the combination of transport costs and production costs. Transportation costs involve distance, and mode, and level of development of the transport system. Production costs are influenced by the factors of production to be discussed. The locational aspects have been described through the concept of economic rent. Other factors may affect the pattern that develops because of these two variables, but the influences are highly variable, depending on the degree of influence, and the other factors present.

FOOTNOTES

1. Thoman, Conkling, and Yeates; "The Geography of Economic Activity"; McGraw-Hill Co.; New York; 1968; p. 153.
2. Hoover, E.M.; "The Location of Economic Activity"; McGraw-Hill Co.; New York; 1948; p. 102.
3. *ibid*; p.90.
4. Dunn, E.S.; "The Location of Agricultural Production"; University of Florida Press; Gainesville; 1954; p.7.
5. Hoover, E.M.; *op cit.*; pp.185-214.
6. *ibid*; p. 212.
7. Chisholm, M.; "Rural Settlement and Land Use"; Aldine Publishing Company; Chicago; 1962; p. 12.
8. Barlowe, R.; "Land Resource Economics"; Prentice-Hall; Englewood Cliffs; New Jersey; 1958; p. 233.
9. *ibid*; p. 247.
10. *ibid*; p. 253.

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CHAPTER 3

PHYSICAL FACTORS

The first in the given list of inputs is geology. This has both a direct and an indirect effect in modifying the production function. Soil is a product of five major factors: local climate, parent material, organisms, relief and elevation, and the age of the area. Parent material involves the type of rock which is weathered into the particles making up soil. Geological structure is a direct determinant of agricultural production. Rock type is also involved with relief, geomorphology, micro-climate, etc. This indirect effect will be considered when these other factors are studied as factors of production.

The bedrock of Bruce County is of two types - Lockport and Guelph limestone.¹ Simcoe county is underlain by Trenton limestone.² However, soil development in these areas is not directly related to the type of underlying bedrock. And because the bedrock is deeply buried, it has little effect on soil, and present agriculture.

The indirect effects on the other factors can be considered in the following way. The different classifications represent different compositions of the same basic rock: limestone. Differing indirect effects due to this composition difference are negligible.

However, this entire discussion becomes largely academic

when the next two production factors are considered. Both areas are glacial in origin. They are very close to being identical in geomorphology. The actual landform, the next factor, is a clay plain in both cases. Both were formed by the deposition of alluvial material by glacial lakes at the end of the last ice-age. The only difference between the two areas is the presence of eskers and kames in the Lion's Head Clay Belt. These form two winding ridges of different material laid down in a different way than the major part of the clay plain. They are of little significance though. They make up only a very small proportion of the land area. Also, they are not high or steep enough to influence agricultural development significantly. With respect to agriculture, the two areas can be considered similar in geomorphology and landform. The differences which occur are of such a minor nature that they play no significant role in altering production.

The next factor, relief, is very important in agricultural discussions. It affects many other factors, notably soil, ground water level, and the limits to usable technology. In these two areas, relief is almost identical. It is a characteristic of glacial clay plains that they are extremely flat. This applies to both areas. Some change in relief does occur in each though, and even though minor, has effect on each production function.

In the Lion's Head area, the clay belt is basically round. The eskers and kames ridges, while interrupting the relief, do not actually change the relief of the plain section. In the Elmvale region, the clay plain areas are spread out, and occupy an area which is very irregular in shape. Both are lower than surrounding areas, having once been lakes. The Lion's Head region could be compared to a large pie-plate. It slopes gently down from the surrounding area, has a very wide, flat bottom, and then slopes up again. The Elmvale Plain is then like a series of small pie-plates. Because it has a much longer "coastline" where it meets higher ground, it has much more gently sloping areas, and less flat "bottom" than the Lion's Head area.

This does not alter the fact that the relief is gentle in both areas. Drainage is very poor, but slightly better in the Elmvale area, due to the above fact. And when comparing two flat areas, even a slight difference in relief may cause a significant change in production.

The next physical factor, slopes, can be related to a great degree to relief. Obviously, changes in relief create slopes, so this aspect of slopes need not be repeated. However, there are some other ways in which slopes may influence production. One is degree of slope, and the other is location.

Slopes in both these areas are, as mentioned, shallow,

and broad. Because they are found around the perimeter, in both areas they do not create interruptions which divide flat areas into small segments. The two gravel ridges in the Lion's Head Belt are interrupting slopes, but the land area, on both sides and between, is large enough that they do not dissect anyone's farm. In the historical discussion, it will be pointed out that settlement spread out from the ridges. They therefore are not a physical interruption to any farming unit.

The next factor is one of the most important in agricultural considerations. This involves the soil, and its condition. In the Lion's Head Clay Belt, there are three main soil types in the plain section. They are all Dark Grey Gleysols indicating that they have very poor natural drainage. Characteristics are as follows:

Ferndale Clay Loam, and Ferndale Silt Loam-

- very smooth, gentle slopes, stonefree; neutral to slightly alkaline;
- need phosphates; five inches of dark grey-brown clay loam or silt loam over clay

Wauseon Sandy Loam³

- very smooth; gentle slopes; stonefree; neutral to slightly alkaline
- needs phosphate

In the Elmvale region, there are also three main soil types. Two of these are Dark Grey Gleysols, and the other is a Grey-Brown Podzol. This usually indicates better soil, but in this case, limitations do exist. The characteristics of all three types involve:

Lovering Clay (Grey-Brown Podzol)

- smooth; imperfect drainage; stonefree

Minesing Marly Clay

- smooth; poor drainage; stonefree

Atherly Clay

- smooth; poor drainage; stonefree⁴

All these soils are similar, in that they are clay-based lacustrine deposits. Drainage is poor throughout, and five are Gleysols. The only one not waterlogged also has drainage imperfections. All but the Atherly Clay Areas are recommended for general agriculture only, because of the drainage problems. The Atherly Clay sections are recommended only for hay and pasture. The soils seem to be similar in potential. If all the other factors of production were equal, these slightly different soils would produce similarly. The big question in how this potential is tapped seems to be the amount of underdrainage introduced by man.

Stream flow does not vary significantly. Both areas have streams of differing size. The streams are slow moving and small, because of the gentle relief. The role of streams in irrigation is negligible. They are neither large enough nor dense enough in occurrence to represent barriers to production. All are mainly factors in one way - drainage. And, as has been discussed, they are poor in this respect.

Groundwater supply affects agriculture, but in both areas, the supply is the same. There is no limit due to a lack of usable water, as in dry regions. Rather, the

groundwater is a hindrance, because of the poor drainage. The water table is often high and may lead to spring flooding, and the drowning of crops during wet seasons. But the problem applies to both regions. Groundwater supply certainly affects production, but would not be a factor leading to different production.

Climate in both areas is similar, although obvious micro-climate differences do exist. In both areas, the general limits are the same. Precipitation, both total amount, and distribution through the seasons, is the same. Lion's Head is farther north, but this fact is compensated by its location between two large bodies of water. Frost-free season, and hours of sunlight are also similar, as the latitude, and maritime influences balance each other. For the purposes of this study, climate differences play a minimal role in creating agricultural differences.

Natural vegetation does not vary significantly. Elm, ash, and cedar growth was very dense in both areas, but each has long since been cleared. The areas are alike, both in the natural vegetation in the past, and the present cleared condition. This cannot be considered a factor which has created differences in agricultural production.

One may conclude from this examination of the natural environment, that physical factors cannot be cited as accounting for these major differences in agricultural development between the two areas.

FOOTNOTES

1. Ontario Soil Surveys - Bruce County.
2. Ontario Soil Surveys - Simcoe County.
3. Op cit., Bruce County.
4. Op cit., Simcoe County.

CHAPTER 4
HUMAN FACTORS

Human factors play an important role in agricultural production. As with the physical, these must be compared for the two regions, to determine which, if any, are responsible for production differences. The complexity of human activity was mentioned before. Some of the factors cannot be measured as precisely as physical factors. But exact measurements are not always necessary to point out significant differences between the two areas.

Another consideration in the discussion of human factors is cause-effect relationships. Differences in some factors between the two areas may be the result of other developmental differences. Average farm size for Eastnor Township is given as greater than three hundred and ninety-nine acres.¹ One farm in the Lion's Head Clay Belt involves fourteen hundred acres, and others are nearly as large. In Elos, the largest by far is only seven hundred acres. But this is not a cause of production differences. In the past, farms were of similar sizes, but other factors have dictated that large size is essential to viability in Eastnor.

The land tenure system is another factor. Both areas involved private ownership of small farms until relatively recently. This change to huge farms in Eastnor has created

financial pressures the small holder cannot accept.

Therefore, ARDA and other government institutions are buying land, and subsidizing some farmers in land purchases, in an effort to consolidate the farms into larger, more viable units. Another difference is shown by the Warder family holdings. Several relatives own and operate average-size farms, but co-operate in helping each other, so that, in reality, they are operating one large eight hundred acre farm. But this too is a symptom of other problems. The tenure system did not create production differences, but is changing because of them.

The next two factors involve the economics of production and distribution. It is here that great differences in the present agriculture are revealed.

The economics of production of the two areas are very distinct. In Eastnor, the units, as mentioned, are very large, and actually are still growing. Little capital is available for land and equipment improvement. Operations are increasing in size to take advantage of economies of scale. Land use is extensive. In Flos, the situation is quite different. The units are smaller than in Eastnor. Operations are increasing in value and level of technology, but not in size. Farmers are taking advantage of increasing returns to capital investment. The economics of production for the two areas are vastly different.

In the economics of distribution, the areas are also different. As used by Wood, the economics of distribution involve two different costs. The first is transport costs, which are largely determined by distance. The first is transport costs, which are largely determined by distance. The second aspect concerns the mode of transport, and how well this mode is developed, in the sense of economics of specialization, and economics of scale. Flos township has major highways passing near and through it that provide access to the large markets of the south. Until ten years ago, shipments could be made by rail, but now, motorized transport is used exclusively. In Eastnor, there has never been a railway. Water transport ended in the 1920's, so here too, trucking is the only shipping method. However, the area is much farther from the markets than Flos. Also, there is only one highway in the area. The area is therefore faced with higher transport costs.

The second aspect of economics of distribution also shows differences between the areas. Because the Elmvale Clay Plain is part of a large, well-developed agricultural area, the transport system is also well developed and to a large degree, specialized. The Lion's Head Clay Belt, on the other hand is the single agricultural area in the Bruce Peninsula. Therefore, the transport system is less highly organized. Both aspects favour Flos. The economics of dis-

tribution are better on both counts.

These two factors - economics of production and distribution, are among the most important in the list of factor differences between the two areas.

The next human, or socio-economic factor, is labour supply. From interviews with local operators, it would seem that both areas have a labour problem. This is made more complicated by the fact that Flos Township is an area of more intensive use, and has more labour requirements. Both areas are affected by labour shortages, but not enough to cause any significant difference. The balance is achieved by the differences in supply and need over the two areas.

Market structure is the next factor. The areas, in reality, serve the same market, Southern Ontario. However, since different products are being supplied, there must be some differences in market structure. And because one area works privately, and the other through co-operatives, market structure is mainly a result; the structural differences of the market are due to the fact that production in the two areas has developed differently. There are some causal elements in the past, but these will be discussed with other historical factors.

The next human factor involves level of education. Educational opportunities are equal today. But in the past,

they may have differed over the two areas. If the educational levels achieved by the occupants in the past are different, it may create differences in production. Unfortunately, no data is available to measure this on a township basis. A county breakdown, based on the proportion of people not attending school who finished their education at each grade level is available for the counties. When comparing these, it must be remembered that Simcoe County has larger centres such as Barrie, Orillia, and Midland. Urban areas tend to have higher levels of achievement than rural areas, so this influence must be considered. In Bruce, 66.4% of the population has Grade 8 or less. In Flos, the corresponding figure is 55.0%, although a larger proportion here is uneducated, or has only Grade 4 than in Bruce. All the secondary and continuing figures are slightly higher for Simcoe. These can largely be attributed to the predominance of the urban areas. Slight differences in the educational levels of the rural areas may occur. However, these are not nearly enough to cause the production differences.

The next factor, social capital, refers to the existing structures in the society. These two areas are identical, to all intents and purposes. They are both rural, and being part of Southern Ontario, have very similar sociological characteristics.

Disease is another similar factor. Disease of crops,

cattle, etc., is not a major problem in any area of Southern Ontario. Seasonal problems may occur, but our technology, available to all, prevents chronic difficulties. Neither of the areas has been the victim of a problem significant enough to create the production differences seen.

The policies of the government is the final factor, to be considered. The government plays different roles in the two areas, but it is difficult to assess the effects of these roles. Tax rates, and the participation of ARDA favour Eastnor Township. However, tax rates weren't sufficiently low to reduce costs enough to permit production change, and now, ARDA is merely involved in financing farmers in their efforts to expand the scale of their beef operations. Production will be detailed later, but it is sufficient to know that government participation does not affect production.

As with the physical factors, some of the human elements are enough alike to be considered identical for the purposes of this study. This means that the differences between the two areas, with respect to these factors, are too small to affect production. One point that has come through very strongly is the importance of historical factors. Some of the major differences have both cause and result relationships. The goal of this investigation is to establish what factors have influenced production, and how. In this way,

the role of isolation can be assessed. But just as important as how these affect production, is what factors have caused them to differ. For this reason, an historical analysis of these factors becomes necessary.

FOOTNOTES

1. "Economic Atlas of Ontario"; University of Toronto Press; Toronto; 1969; p. 64.
2. "Government of Canada Census"; 1961.

CHAPTER 5

HISTORICAL FACTORS

The history of development of an area is a subject which in itself deserves detailed attention. Flos Township, part of ancient Huronia, has been the subject of many such studies. However, this study is not concerned with historical detail, but only demands attention to the forces affecting development. The development of each area can be divided into general eras, periods of time of varying length. By investigating these eras, their length, sequence, and impact, the role of each in influencing further development can be assessed. Some factual detail is necessary to show what the causes of the different development periods were. In this way, production can again be linked to the inputs in the two areas, and the role of each determinant can be estimated with some degree of accuracy. Factual detail for the various periods will be presented in chart form. In this way, detail for the two areas can be easily classified and compared. A discussion of the roles of the time periods will follow.

HISTORICAL PERIODS

FLOS TOWNSHIP		EASTNOR TOWNSHIP	
1830	SETTLEMENT		EMPTY
	-settlement begins along established Penetang Road		-area unsettled
1840	-settlement continues		
	-more people; reciprocity with USA		
1850	-more land cleared; wheat boom begins		
	-crop failure in 1858		
1860	DEVELOPMENT		-first purchase of land
	-diversification occurs		
	-more land clearance		
1870	-development to general agriculture		SETTLEMENT
	-end of clearing, late 70's		-settlement begins along ridges in clay belt
1880	BOOM		-water transport only
	-railway built, growth		-population about 200
	-mills, elevator built, 1887		-land being cleared, drained
1890	-boom continues, population about 3000; general agriculture, cash crops		BOOM
			-lumber boom begins
1900	-wheat continues decline		-trade still by water
	DEVELOPMENT		-farms supply food to camps
	-continuation of general agriculture; growth slows		-agricultural boom, cash crops; forests depleted
1910	area prosperous		DEVELOPMENT
	-general agriculture continues		-change in crops to vegetables
1920			-sold to tourists; expanded to regional market
			-Center Road made usable
			-end of water transport
1930	DEPRESSION		DEPRESSION
	-arrival of great depression		-great depression; subsistence farming; no cash, farms drop
	-no cash; farms decline		STAGNATION
1940	BOOM		-area slow to feel effects of war; prices still low, no cash for farm improvement
	-boom with arrival of war		-can't match changing technology elsewhere
	-prices increase; cash crops		-switch to beef ranching
1950	-boom continues, money available for land improvements		-extensive farming using economies of scale
1960	DEVELOPMENT		-unit size continues to expand
	-boom over, growth continues at steady rate; railway closes; highway transport becomes dominant		
1970			

It is almost impossible to separate the discussion of history from mention of the nature of production. Past events are closely linked in most discussions to past production. Here, only the major factors in development, as influence the developmental periods, will be examined. And only the major expressions of production changes. Relating these changes and factors will be based to a great degree on the work of historians. Detail varies from source to source, but the general findings agree. These are what we are concerned with here, and seem valid from current knowledge.

The most obvious difference in the historical factors is the time of settlement. In Flos Township, settlement period was characterized by the usual clearing and developing of land, and by the end of the settlement period, the area was inhabited enough to take advantage of Reciprocity with the USA and the resulting wheat boom. The end of the boom in 1858 coincided approximately with the end of the settlement process; The land was settled, if not entirely cleared, and the land holders were adequately supplied with money (by the standards of the day) from the wheat boom. The next twenty years were involved with the development and improvement of the area.

Census data is available in the chart on page 35 to show the changes over time for certain products and land characteristics. There are a number of limitations involved

here. The number of characteristics is limited, because much data is available only on a county basis. The data that is available is from the township level, but it must be remembered that the two clay belt areas comprise only a part of the township in each case. In Eastnor, this is not serious, as the land outside the Lion's Head Clay Belt is scarcely used for agriculture. However, the part of Flos outside the Elmvale Plain is very good agricultural land, and influences the statistics. It must be assumed that the Clay Plain shows the same characteristics as the rest of the township in its development. This must be kept in mind when the figures are used.

Production over time

		1871*	1881 ⁺	1891	1901 [⊕]	1911	1921
Population	E.	678	1364	1484	255	1642	1148
	F.	1756	3141	3782	541		3034
Area	E.	13459	34529	39830		36937	35129
Occupied	F.	26446	36239	47887		55600	58374
Improved	E.	2392	3230	8953		14703	16615
(acres)	F.	10756	21385	31500		40093	38739
Cropland	E.	2178	2925	7862		11763	12913
(acres)	F.	9024	18069	25712		29568	28809
Pasture	E.	187	229	951			2936
(acres)	F.	1627	2960	5363			6058
Wheat	E.	2488 b	8052 b	1076		717	432
(acres)	F.		43285 b	6208		4033	3475
Oats	E.	1772 b	6861 b	1190		2948	3172
(acres)	F.		78244	4654		8491	8555
Hay	E.	499	744	2099		5645	
(acres)	F.	4631	5708				
Mixed	E.					53	361
(acres)	F.					1251	2328
Cattle	E.			1311			
	F.			4696			
Swine	E.			2170			
	F.			2663			

E. - Eastnor Township

F. - Flos Township

* - information for Eastnor aggregated with Albermarle Township

+ - information for Eastnor aggregated with Lindsey, and St. Edmund's Townships

⊕ - refers to land occupants only

- refers to rural population only

Production over time continued

		1931	1941	1951	1961	1966
Population	E.	1148		717#	546#	502#
	F.	2929		1521	1422	1281
Area	E.	41942	36432	42219	49325	46335
	F.	59753	54908	51844	47991	44217
Improved (acres)	E.	17829	17314	18320	18140	18750
	F.	39629	38191	35233	36975	34064
Cropland (acres)	E.	13984	13043	11865	9794	10112
	F.	28106	26493	25169	24153	23193
Pasture (acres)	E.	2914	2925	5543	7537	7963
	F.	6652	6919	5873	10468	8718
Wheat (acres)	E.	374	350	57	106	22
	F.	4092	2057	3204	1539	592
Oats (acres)	E.	2335	2133	1713	1497	1124
	F.	6705	7159	4845	4447	1974
Hay (acres)	E.	8074		5819	5866	6358
	F.	8192		8045	11405	11531
Mixed (acres)	E.	1040	2263	3538	1962	1991
	F.	4623	5481	6906	5141	6529
Cattle	E.	3529	3538	3753	6512	6965
	F.	4479	7260	6380	8995	10222
Swine	E.	1117	2233	2789	1727	1809
	F.	5327	6716	7154	6923	9022

A third limitation stems from the fact that the same data was not always collected in consecutive censuses. This is especially true for the 1901 census, in which no data was collected on a township basis. This presents a serious gap in the data.

There is no census information for these areas before 1871, and for the first two censuses, the data is limited. Eastnor is grouped with other townships, and few production figures are shown for either area.

During the entire settlement period, and part of the development period of Flos discussed earlier, Eastnor stood empty. Settlement did not begin until the 1870's. This is shown by the 1871 census, in that the settlement statistics for Flos are far larger than for Eastnor and the others.

The development period in Flos is seen from the fact that between 1871 and 1881, improved acreage increased more than the amount of land occupied. In Eastnor, where settlement had just started, occupied land increased by 21,170 acres, over the same period of time. Obviously then, one of the major historical facts is time of settlement. And the time of settlement was determined by distance and by accessibility. Flos was closer to settled areas, and was on the Penetang Road which was developed early for defence purposes. For these reasons, it developed earlier than Eastnor.

The next period in both areas was a time of rapid expansion. In Flos, this was brought by the arrival of a railway into the area. It lasted from around 1880 until the turn of the century, when growth slowed. Growth continued then until 1930, but at a slower rate. This was another period of development, but not boom. In Eastnor, this rapid growth was brought about by the lumber boom. There was great demand for cash crops to provision the lumber camps in the rest of the peninsula. It began in 1890 and ended when the forests were depleted about 1915. The local farmers were able to change fairly quickly to other cash crops, which were used to supply the regional market. This supported a development period of slower growth until 1930.

Census data for these time periods is not too informative. As was mentioned, there is no data for 1901, and in such dynamic areas, a time span of 20 years is too wide a gap to yield accurate results. The boom period in Flos, which was in process in 1891, is seen in the increases in land occupied, improved, and cropland. Actual production can't be detailed because of the lack of earlier data. Wheat surpassed oats, as the railroad brought large milling operations to the area. The results of the boom in Eastnor are seen in the 1911 data. There were great increases in occupied land, and cropland. The increases in hay and oats reflect the cash crops being used to supply lumber camps, where horses were

used in great numbers.

The development period in Flos lasted thirty years until 1930. Land occupance, and use remained the same, as seen through the censuses of 1911, 21, and 31. Products remained the same, as well. This was a time when farmers saved, or made capital improvements. In Eastnor, the development period lasted only fifteen years. Although not shown in the census, production changed to cash crops such as potatoes and corn. Money was used by the farmers to equip themselves for this change.

The major point to establish here is that the boom and development in Flos was the result of a permanent investment - the railroad. This increased the accessibility of area, and influenced the economies of distribution, putting the township in a more competitive position. However, in Eastnor, the boom was temporary, the result of an increase in local demand. Development occurred after the boom, as the area was able to compete regionally. This was lost in the depression, and not regained because land transport replaced water transport as most economical. No railroad was ever built to Eastnor, and Highway #6, the only major highway, was not built until the 1920's. None was built later, and it remains as the only access today. Increases in the infrastructure development of other areas made Eastnor relatively more inaccessible and isolated.

Development in both areas was entirely wiped out in the next ten years by the Great Depression. Commercial farming failed, and subsistence farming was the only activity. No cash was available, and the farms underwent a great depreciation in value. No one could afford to fix buildings, clear land, or in any other way, improve their holdings. The census of 1941 shows this. Over the ten depression years, land occupied, improved, and cropland remained constant. One noticeable change in Flos is the switch to oats, hay, and mixed grains used as feed for the increased animal population. Flos emerged from the depression in better shape than Eastnor, simply because it started out better. This was mainly due to the fact that the farmers in Flos had more years and money to improve their land, before the depression started. And, as was mentioned earlier, the time of settlement was directly determined by the degree of isolation of each area.

This is the major historical factor to keep in mind for the time preceeding the second world war. A new era started then, and the most important historical factor influencing this new development was the condition of the farms. Farms in Flos were better. They survived the depression because they were in better condition at the beginning of the depression. And they were in better condition then because, having been settled longer, they had been the subject of more

capital and labour investments.

The years after the depression brought a new era of prosperity to Canada as a whole. Flos benefitted greatly from this. It had much cleared land, and was accessible to the major markets. Cash crops predominated, and a rich dairying industry developed, because Flos could compete in the expanding markets of the Golden Horseshoe. This expansion meant both an increased demand, and a decreased supply, as much land in the Horseshoe was taken out of production by urban expansion and speculation. Money from cash crops was available to the farmers of this area, and capital investments soon led to the recovery of this area in terms of value and improvement. The boom gradually slowed, but growth still progressed, as the farmers had the opportunity and the ability to improve their holdings.

The census material from 1951, 61, and 66 shows these trends. Land characteristics show that a little less land is being used. There has been a change in products too, as dairying increased in importance. Less land is being used, but the use is more intensive.

However, in Eastnor Township, changes since the war have been quite different. It was too far from the major markets to take part in the post-war boom which hit other more accessible areas. Growth has occurred, but in a way that offers little encouragement or hope. Because the area did not get

the income increases experienced elsewhere from cash crop production, the poor state of the land remained for a long period of time. This started a circular process. The farmers had to use economies of scale to compete with the areas which had the capital to improve. This has led to beef production, a further lack of capital, and the continuation of the process of growth in size, rather than in land potential.

These trends are also seen in the census material for 1951, 61, and 66. The improved amount of land has remained steady, but there is more pasture and less cropland. Hay production, and the number of cattle has increased by a large amount. This reflects the falling back of land conditions and the increase in extensive land uses.

The major factor which has created this difference is again related to distance and accessibility. This, along with the land condition, was a major factor bringing about the different effects of the post-war prosperity in the two areas.

Isolation affected the production before the depression, and has greatly determined the nature of development since.

Through history, then, the major factor causing differences has been isolation. Settlement occurred late in Eastnor because of it. The only period of prosperity was based on local conditions which soon changed. At the start of the

depression , isolation had caused slower development, because of the loss of regional markets to more accessible areas. After the depression, isolation continued and actually increased, as other areas improved their accessibility.

FOOTNOTES

1. Government of Canada Census, 1871, 1881, 1891, 1901, 1911, 1921, 1931, 1941, 1951, 1961, 1966.

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CHAPTER 6

INPUT AND OUTPUT DIFFERENCES

The various inputs into the system, and the role of historical influences, have been presented. The next step in the analysis is to relate the differences in these to the differences in production. But before this is done, there are two exercises which will clarify the situation, and make the analysis easier. The first is to discuss the actual present production. Production has entered the investigation in several places, but only in a general way. Even the specific census data only reaches 1966, and at any rate, is a total for all farms in the townships.

The chart on page 48 summarizes the information received from personal interviews with land holders in each study area. Farmers to be interviewed were selected randomly, and were asked the same questions. Five were contacted in Eastnor, and eight in Flos. One refused to give specific data in Eastnor, but the four who answered controlled as much land as the eight in Flos.

The symbols in the chart have the following meanings:

TYPE -

- beef production speciality -
 - FL - feed lot operation; buy steer calfs in the fall, feed for one year and sell
 - CC - cow and calf operation; cows bred, calfs allowed to mature on the farm
- D - dairy specialization
- M - mixed - no one type of production is dominant
- S - specialized - production of one product other than beef or dairy
- P - part time farm; agriculture is only a partial source of income

CONDITION

- this is an estimate based on an assessment of land improvements and the condition of buildings and equipment
- A - excellent
- B - good
- C - fair
- D - poor

LABOUR

- F - labour supplied by farmer and immediate family only
- F+ - several brothers help in operating separate farms as a unit
- numeral - number of full - time hired hands

ANIMALS

- all numerals represent actual numbers

FIELD PRODUCTS

- all figures represent actual acres of land in production

MARKET

- position - first line - primary market
- second line - secondary market
- third line - minor market

- W - Wiarton Co-op
- T - Toronto
- L - local supply
- F - foreign market

AREA DRAINED

- all figures are in acres of land

Farm Survey Data

ITEM FARM	E.1	E.2	E.3	E.4	E.5	Total Eastnor
TYPE	FL	CC	CC	M	CC	
SIZE	1400A	480	200	100	800	2980
CONDITION	C	C	D	D	B	
LABOUR	F	F	F	F	F+	
CATTLE-BEEF	650	115	70	20	*	855*
DAIRY	0	0	0	15	0	15
SWINE	0	0	0	0	0	0
SHEEP	0	0	0	0	0	0
POULTRY	0	0	0	*	0	0
GRAIN	40	0	20	15	*	75*
HAY	250	100	57	35		442
ROUGH & WOOD	200	0	73	0		273
IMP. PASTURE	910	380	50	50		1390
MARKET 1.	W.	W.	W.	T.	W.	
2.			T.	L.		
3.						
AREA DRAINED	0	0	0	0		50
COMMENTS				Sold Out		

ITEM FARM	F.1	F.2	F.3	F.4	F.5	F.6	F.7	F.8	Total Flos
TYPE	M	M	D	S	M	M	P	M	
SIZE	400	400	150	100	200	300	100	700	2350
CONDITION	A	A	C	B	B	A	C	A	
LABOUR	F	F	F	F	F	F	F	2	
CATTLE-BEEF	50	?	0	0	25	50	0	0	125*
DAIRY	30	33	40	0	12	0	0	120	235
SWINE	0	0	0	150	50	200	0	600	1000
SHEEP	0	0	0	0	20	0	0	0	20
POULTRY	0	0	0	0	0	0	0	0	0
GRAIN	160	158	84	60	48	175	0	325	1010
HAY	125		50	40	60	85	30		390*
ROUGH & WOOD	75	242	0	0	0	0	0	375	75
IMP. PASTURE	40		16	0	92	40	0		188
MARKET 1.	T	T	T		T	T	L	T	
2.		F							
AREA DRAINED	400	300	150	100	50	200	100	420	1720
COMMENTS				New			70A rented out		627A in hay & pasture out

* - figures not given by owner

⊛ - partial totals only

The chart shows the nature of production in Eastnor. It is entirely beef production except for one small mixed operation. This has recently been sold through the government ARDA program, and is going out of production. It is in poor condition, as is the other small farm. Even the bigger farms are only in fair condition. There are 855 beef cattle on the four farms, and 15 dairy, soon to disappear. Of the 2180 acres on these farms, only 75 acres are used for grain. Most, 1390 acres, is pasture land. Fifty acres on the farm which wouldn't detail production are tile-drained. This is the best farm in the Lion's Head Clay Belt, but the condition of the land, buildings, and equipment seems poorer than the condition of many farms in the Elmvale area.

In the Elmvale Clay Plain, there is a variety in operations, but mixed types predominate. The four largest farms, from 300 to 700 acres, are all excellent operations. Even the worst of the smaller units is considered fair. Animal stock also shows variety - a mixture of beef and dairy cattle, hogs, and a few sheep. Another major difference concerns the production of grain. On the farms in Flos, 1000 acres produce grain, but in Eastnor, only 75 were used in this way. Of the 2350 acres in the eight farms, 1720 acres are tile-drained.

The specialized farm is going into hog production next season. It was recently purchased, and is undergoing

renovations, The part-time farm is partially rented to someone else, and 30 acres are used for hay, or cash crop production to be sold locally. Actual production varies yearly.

Other than these, all the farms market primarily in Toronto. The dairy farm in Eastnor shipped to Toronto too. All beef is sold through the Wiarton Co-op, for shipment to markets in Southern Ontario.

These are the characteristics of production, as found through the personal survey.

The second exercise which will facilitate analysis involves summarizing, and relating the various inputs which are significantly different.

Of the physical factors of production, the following were felt to be significantly different: relief, and potential productivity. There is a common element in these two - drainage. When potential productivity was mentioned, it was stated that potentials were equal, depending on drainage. The Elmvale Plain has slightly better natural drainage as discussed earlier. More significant, it is largely tile-drained as evidenced by the data from the personal interviews. At present there is a tremendous difference in productivity between the two areas.

There were more differences between the areas concerning the human factors of production. Some were classed

as results of other differences - ie. - unit size, and tenure system. Market structure was discussed as another factor which differed between the two areas. Much of this is a result of changes in the past. These factors, though results of other conditions, now exist as differences and may have an effect on production in the future. The major influences which have created differences in the human side are economies of production, and economics of distribution.

The other discussion on factors affecting agricultural development was concerned with historical considerations. It was concluded that the major factor leading to past differences was isolation. It acted in two ways, creating the difference in land condition after the depression, and creating the differences in development after the second world war. Isolation was by far the most important variable, having more influence than all the other historical factors put together.

The two areas have been compared factor by factor. The significant ones, which may cause production differences are: drainage, economics of production, economics of distribution, and historical development.

CHAPTER 7

THE RELATIONSHIP BETWEEN INPUT AND OUTPUT DIFFERENCES

The various factors here are inter-related, and can be listed in a hierarchy of occurrence, and importance. The economics of distribution will be the first discussed. As was described before, transport costs are higher in the Lion's Head Clay Belt than in the Elmvale Clay Plain. Since both areas compete in the same free-enterprise market, revenue from the sale of any product will be the same no matter which area it comes from. Therefore, Flos Township will have an advantage because its transport costs are less. Its economies of distribution are better developed, because of distance, existing infrastructure, and the scale of operations.

The economies of production now deserve attention. Differences in the economies of production between the two areas have both cause and effect influences. This difference is the result of two main factors. The first is historical. The general prosperity that has affected Ontario through the last twenty years has had quite different results in the two areas under investigation. Basically, Flos township has benefitted directly. It has been able to specialize in cash crops, and therefore, investment capital has been readily available. Eastnor has changed in a different way. Production has not been of a type which yields much cash.

The other factor affecting the economics of production is the economics of distribution. Because the operators in the Lion's Head Clay Belt face higher transport costs, they must somehow reduce production costs, if they are to compete in the same markets as farmers in the Elmvale Clay Plain.

The combination of these differing forces has had the following results: farmers in Eastnor have been trying to reduce production cost through economies of scale. Because they lack capital, they have had to do this using land without improving it, ie. - in an extensive way. Meanwhile, farmers in Flos have been in a better position all along in terms of competition. Capital has been available but since they did not have to expand physically, this has been used to improve the land. The use of the land in the area is intensive.

It is here that the other factor difference, drainage, enters the picture. The farmers in the Elmvale Plain have had the capital to improve their land. It was pointed out that the major land use limitation in both areas was drainage. This was an obvious factor seen in the discussion of production. Natural drainage may have been slightly better in Flos, but not enough to cause the production differences seen today. Today's drainage difference - the tremendous amount of tile-drained land in Flos compared to Eastnor, is a result of other factor differences, mainly the availability

of capital for land improvements.

Drainage and economies of production assure the continuation of the present development trends. Elmvale farms get better and better, as the capital improvements are made. Farms in the Lion's Head Clay Belt get bigger and bigger, as they try to compete by taking advantage of economies of scale. The actual productivity of the land is changing, and the gulf widens. The more time that passes, the harder it will be for the Eastnor farmers to increase the productivity of their land.

CHAPTER 8

SUMMARY AND CONCLUSION

The purpose of this study was to investigate the effects of isolation on agricultural development. Because of the number and the complexity of the forces affecting agriculture the problem was limited by finding two areas which seemed similar except for the isolation factor. The Lion's Head Clay Belt and the Elmvale Clay Plain have been compared, factor by factor, to determine why production differences occur. By itself, isolation will not necessarily affect agriculture. The best example of this is Liberia, Africa. In this country, there are two economies, entirely separate, with no interaction. Agriculture is strictly of a subsistence value, whether near the port cities, the iron mines, or back in the jungle. However, when agriculture becomes an economic consideration as in our areas, and there is interaction with other parts of the system, isolation becomes important. It is not a force by itself, but strongly affects development through some of the factors described in this study.

When these areas were involved in the settlement process, production was similar. Agriculture was semi-subsistence, as the main concerns were supplying the basics of life, and trying to expand. Anthropologists tell us how commerce developed with excess agricultural productions and how this

led to the growth of civilization. In a smaller sense, this is what we have been concerned with here. As more land was cleared, production rose, commerce developed, and these two areas emerged as parts of the large economic system - Southern Ontario. Each part though, has emerged differently. This is due to the isolation factor, as shown by the results of this study.

Historically, there are two main differences to point out. The first is time of settlement. The Lion's Head Clay Belt is isolated, both in terms of distance, and land use. Settlement occurred significantly later here than in the Elmvale Clay Plain. As a result, the Elmvale area became integrated into the economic system of Southern Ontario sooner than the Lion's Head area. By 1930, when the Great Depression began, it was a well developed area. It was therefore able to with-stand the depression years better than the Lion's Head Clay Belt, and emerged in 1940 as a more prosperous region. Isolation is obviously the major factor here.

In the post-war boom years, it was in a position to prosper, because of the level of development it had achieved. As well, it was favoured by distance, and a well developed transport system. It therefore expanded and prospered while the Lion's Head area retrogressed. It was favoured by both production costs and transport costs. As described

in the summary of location theory, land use developed as more intensive than in the unfavoured area. Isolation affected both the difference in production costs, and the difference in transport costs. It clearly dominates the historical factors affecting development.

But isolation has not only played a historical role. It is a major influence on the present situation. The first factor difference between the two areas today is the economics of distribution. This is composed of three costs - related to distance, mode, and level of development. The mode is the same; both areas rely on trucking, so this part of the cost is the same. Distance from market is unequal, so this cost is higher for the Lion's Head farmers. The level of development also favours the Elmvale operators. This clay plain is part of a large agricultural area and the transport system is well developed. However, the Lion's Head Clay Belt is the only agricultural area in the Bruce Peninsula. Transport requirements are smaller, the system is less developed, and costs are therefore higher. Isolation means being set apart. Both distance and land uses set the Lion's Head Clay Belt apart, and favour the Elmvale Clay Plain.

Differences in the economics of production are obvious in the two areas, but result from other factors. At one time, the areas were similar in this respect, but changing conditions

affected the two areas differently. The condition of the land, proximity to markets, and economics of distribution led to production differences in the post-war era.

The situation has been enforced by the continued gap in transfer costs between the areas. The major factor creating the differences in production, and sustaining this condition, is isolation.

APPENDIX

FUTURE CONSIDERATIONS

It has not been the purpose of this study to formulate an explanatory or predictive model. Rather, the exact effects of isolation on development, as concerns the Lion's Head Clay Belt, have been established. A number of trends have been pointed out, and some consideration of future development may prove valuable. This will be very general, and, rather than statements of probabilities, will involve possibilities.

As mentioned, the areas will continue to diverge. But according to economic theory, a maximum point of development for each area will be reached. The Law of Diminishing Returns states that continued capital investment brings smaller and smaller returns over time. Eventually a point will be reached when investment brings less return than the value of the capital invested. Then investment will stop. In Flos, a point will be reached when investment in the land will not bring a great enough return to be justified. Then the nature of development must change. Trends then are open to speculation.

Similarly, in Eastnor, the growth of unit size will stop. There is a maximum size to operations taking advantage of economies of scale. When it is reached, the nature of development here too will change.

Many factors will affect this process. When the maximum points are reached, and the condition of other areas, may be the most important. But as long as one area remains isolated, development will be different.

Another possibility is the growth of tourism in Eastnor and the rest of the Bruce Peninsula. This may offset the isolation factor. It may also enlarge the local market. Again, development depends on the rate and nature of the growth of tourism.

The changing political structure of Southern Ontario may also be a factor in the development of Flos. Regional government, transportation development programs, and the plan for a Toronto-Centered Region may be significant factors here. Again, no predictions can be made because development of these is speculative.

Perhaps as our economy expands, isolation will decrease in importance as an influence on agricultural development. At present, the hope for development in the Lion's Head Clay Belt seems to be for improved accessibility to decrease isolation and its effects.