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HOUSE AND HERITAGE:

A STUDY OF ETHNIC VERNACULAR ARCHITECTURE

OF 1880-1920 IN RURAL ALBERTA

by

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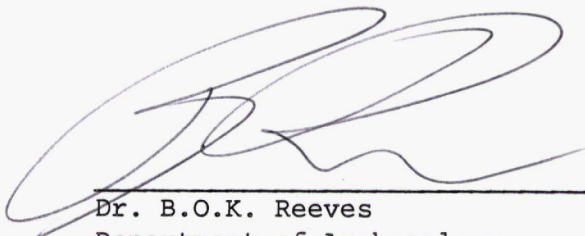
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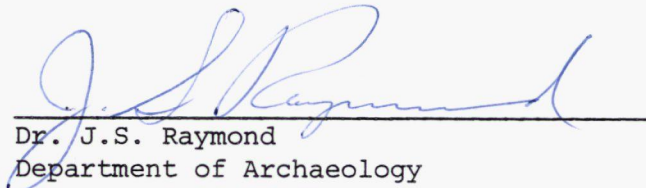
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "House and Heritage: A Study of Ethnic Vernacular Architecture of 1880-1920 in Rural Alberta," submitted by Joanne Lea, in partial fulfillment of the requirements for the degree of Master of Arts.



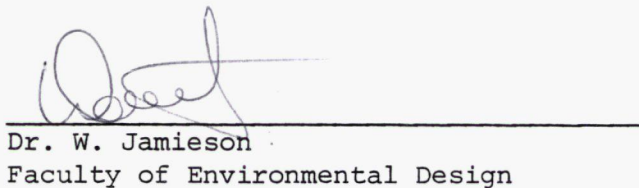
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ABSTRACT

A study of 150 farm houses built in Alberta between 1880 and 1920 indicates that these reflected structurally the ethnicity of their original owners. The 30 houses, each of the five specific ethnic groups studied (British, French-Canadian, German, Scandinavian, Ukrainian), exhibited this in varying degrees for different house attributes when analysed using statistical (chi-square, ANOVA) tests. Similarly tested for a relationship to house attribute patterning were date of construction, and area of construction of the houses. All three variables (ethnicity, date, and area) showed some relation to some house attributes, but the greatest number of these proved to be associated with ethnic affiliation. From an archaeological perspective, the relationships may be used as a model to point out possible attributes for study which may be archaeologically visible and indicate ethnic affiliation when examining a similar house in the archaeological record.

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Those house owners whose houses form the basis of this study are listed in Table 10 and are owed a special thanks for their kindness. Some of these people who went out of their way for me (from meals to transport and telephone calls, cocoa and companionship, and pulling my car out of unfortunate situations) are listed below with thanks: Mr. G. Ballhorn, Mr. G. Crandall, Mr. J. Glass, Mr. and Mrs. Greenwall and Mrs. Johnson, Mr. M. Lang, Mr. and Mrs. Nolte, Mrs. B. Parlby, Mr. Rotvik, Mr. Shoenig, Mr. and Mrs. Strohschein, Mr. and Mrs. C. Victoor. As well, I would like to thank the management of the Stardust Motel, Pincher Creek, Alberta, and the Wetaskiwin Motel, Wetaskiwin, Alberta.

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NOTATIONS

The following abbreviations have been used within the text as a convention to avoid repetition of long titles. They are:

CPR - Canadian Pacific Railway

GIA - Glenbow Institute Archives

UPA - Ukrainian Pioneers of Alberta

UPAA - Ukrainian Pioneers of Alberta Association

He would stand at a corner of his huge house and look closely at the brick and mortar. It was five years since the house had been built. Five years only. Yet already little sand grains in the mortar were crumbling away; already the edges of the bricks were being rounded by a process of weathering. When he bent and looked closely at the ground, near the wall, he saw a thin layer of red dust mixed with those sand grains. This weathering would go on and on; and what would come of it? Dr. Vanbruijk told him of the clay mounds covering the sites of ancient Babylonian cities, loaning him a book or two on excavations. The moment a work of man was finished, nature set to work to take it down again. A queer thought, that. And so with everything, with his machines, his fields, his pool; they were all on the way of being levelled to the soil again.

Frederick P. Grove Fruits of the Earth (1965)

DEDICATION

To Phyllis and Norm

CHAPTER I

INTRODUCTION

Purpose

The area now known as the province of Alberta has undergone many transitions over the past hundred years, a period which corresponds roughly to that in which the majority of the settlement of this part of Canada took place. One of the transitions presently taking place involves the material culture associated with early settlement.

Material Culture is used here in the sense employed by Quimby (1978:xi) i.e. "three dimensional remains of (past) culture". The term has gained recent common use in historical research (see Schlereth 1980; Schlereth 1982) although it is acknowledged to have been an established concern of archaeologists for some time (Schlereth pers. comm.; Gould and Schiffer 1981). Indeed, Noel-Hume (1978:21) has termed archaeology as "Material Culture with dirt on it".

Specifically, the material culture to be herein considered is the vernacular farmstead house built by the early settlers between 1880 and 1920. Some of these houses are, therefore, as old as one hundred years, and although some remain inhabited and maintained, many are abandoned, deserted, and even in ruins. At this point in Alberta's history, therefore, it is still possible to record such houses and make use of oral history sources who have first-hand knowledge of them. To delay a study of these resources may lead to the loss of valuable information as the persons of the settlement generation become deceased, and the integrity of their dwellings in their entirety become part of the archaeological record.

The study Bonnichsen (1973) made of the remains of "Millie's Camp" as an archaeological record in comparison to his later discussion of erroneous conclusions with Millie herself illustrates both how useful first-hand information can be prior to archaeological investigation and how much information is lost as material culture undergoes processes called S-A processes by the archaeologist Schiffer (1976:33). That is, the artifactual material moves from a systemic (S) context in which it is part of daily life into an archaeological (A) context.

The subjects of this study are in transition and are undergoing these processes. This study is not archaeological in one sense, (i.e. the remains are not underground), but follows the admonition of the historical archaeologist Ivor Noel-Hume, that "The past is worth studying as soon as it becomes in danger of being lost" (in Schuyler 1968:203).

As stated, many vernacular farmsteads of the settlement period, and primary information about them, are in danger of being lost. In the view of historical archaeology, it can be seen to be helpful for archaeologists to record as much pertinent information as is available in a systemic or transitional context to assist interpretation of the archaeological record of the settlement period. One purpose of this study may, therefore, be stated as the recording of Alberta's material culture (vernacular farm houses dating 1880-1920) from an archaeological perspective before it is actually part of the archaeological record but so that the information thus recorded, before it is lost, may aid even direct areas of further archaeological investigation.

Related Studies

Studies which have recorded housing from early settlement periods

are not uncommon. Frederick Kniffen (1962) recorded the folk housing of Louisiana and used his information to determine a typology for the houses studied and a pattern of diffusion for the types noted. Glassie (1975) performed much more exhaustive recording of folk housing of the colonial era in Virginia to again establish a typology for this form of housing. Mark Leone (in Schuyler 1978) conducted studies in Mormon folk architecture to draw cultural conclusions based upon its architectural manifestations.

Canada also boasts similar studies. Lehr (1980) compiled an extensive record of the folk housing of Ukrainian settlers in Alberta, and the study acted as an addition to the (material) cultural history of this ethnic group. William Wonders undertook a study with Mark Rasmussen (1980) which recorded pioneer log houses in an area along Highway 57 west of Edmonton, Alberta from the perspective of settlement geographers. A description of log buildings of the study period resulted, as well as some observations about ethnic affiliation exhibited in the log structures (op. cit:209-217). Loy and Sneed (1973:151-161) went beyond observing builder differences reflected structurally in log buildings in Yoho National Park, to testing for them statistically on the basis of attribute clustering. The differences tested were not ethnic affiliation in this case, but occupation (i.e. mining, logging, railroading).

The above studies take historical, ethno-historical and geographical perspectives and only one is seen to attempt to address the kinds of questions an archaeologist asks of material culture. If one examines the (historical) archaeological literature on the topic of settlement domestic architecture there are suggestions regarding the concerns an archaeologist may address. As early as 1910 the following observation

was made:

On the whole, the primitive log cabins were necessarily much alike; but when log came to be superseded by more flexible material, the settlers' first idea was to reproduce the home or the ideal of his childhood and the house tends to reveal the nationality of its builder...even the automobilist may often distinguish the first Wisconsin home of the German, Englishman or the Dutchman (Fish in Schuyler 1978:9).

Over half a century later, in the same work which offered historical archaeologists the Carolina Artifact Pattern for consideration, South comments in a similar vein:

...the historical archaeologist concerned with pattern recognition has an advantage over his colleagues working with prehistoric patterning in that some of the information he seeks is available as given. He can select a group of known domestic house ruins from varying areas and knowl cultures such as those from British-American communities; French-American communities; and Spanish-American communities, and abstract the pattern from each group and make comparisons (1977:84).

Statements such as these suggest the historical archaeologist may wish to pursue pattern recognition studies and that those involving architecture may consider ethnicity where the sample readily presents itself.

Pattern recognition in archaeological study which has dealt with ethnicity is not uncommon, but often deals with media other than architecture such as Flannery (1976) or David and Hennig (1972) who dealt with ceramics; Deets and Dethlefson (1972) and their now famous studies about gravestones. Hodder (1982) does deal briefly with architecture

along with household items, ceramics and weapons in his ethnological studies of the Baringo tribes of Africa.

Certainly, Alberta's material culture offers an ideal sample for such a study since not only are farmsteads and primary sources available, but these represent numerous ethnic affiliations of the persons who settled there.

For Alberta, though Fish and South's mandates from an architectural and archaeological perspective have gone largely unheeded.

Of the architectural studies previously mentioned, all save one dealt with one ethnic group, to define the architectural manifestations of the culture of that group, and in some instances, create a typology.

Wonders' and Rasmussen's (1980) study began with supposedly one house type-log-and did examine ethnicity as reflected in that one type. However, their conclusions are sweeping given their sample, since as they admitted, "The three largest ethnic groups involved in original settlement were Ukrainian, Scandinavian, and German with single representatives of four other groups" (op. cit:197). Further, the "Scandinavian Style" was noted by Wonders and Rasmussen on the basis of four houses only (op. Cit:213).

Loy's and Sneed's (1973) study dealt with three groups of builders occupational if not ethnic, but again a small sample size of eighteen buildings in total. Using a form of cluster analysis, for building attributes they attempted to determine whether clusters of buildings would reflect occupation of builder. The study comes close to following South's suggestion, but valuable though it may have been for showing the feasibility of such work, it resulted in a comparison of "apples and oranges". The eighteen buildings were built during different and

sometimes unknown time periods, and served different purposes. Their common feature was log construction, but it is not surprising that the clusters of attributes placed larger bunkhouses and recreation halls together, and single occupant cabins separately (op. Cit:157-160).

This study proposes to take different approaches that Wonders and Rasmussen or Loy and Sneed and other studies which are concerned primarily with architectural recording alone. A larger sample size will broaden the scope of observations and add firmness to conclusions using a statistical base. Such conclusions are intended to be less intuitive than those made without statistical grounds. Further, statistical tests apply directly to future archaeological studies which must often rely upon numerical analysis of remains and artifacts once the structures themselves have deteriorated. The relationship of ethnicity and attribute patterning will be tested on a sample of buildings which is similar in composition (i.e. all houses built under given conditions) and as is rather than sorted out into the creation of different groups. This type of testing will be more similar to that proposed by South and implied by Fish. The recording and testing will therefore be conducted from an archaeological perspective rather than a solely historical or architectural one. The houses will be recorded so that the information may best be used by archaeologists who may examine material remains to determine human behaviour. The attributes recorded will be those which may be of use archaeologically to note human behaviour (ethnicity in this case).

Therefore, a sample of 150 settlers' farm houses dating 1880-1920, consisting of 30 houses each from five ethnic groups (British, French-Canadian, German, Scandinavian, Ukrainian) was selected from a corridor

of southern central Alberta lying roughly between just north of Edmonton and just south of Pincher Creek and approximately 100 km wide (lat. $49^{\circ} 30' - 53^{\circ} \text{ N}$, long. $113^{\circ} - 114^{\circ} \text{ W}$) (See Figure 1). The architectural elements of the houses were recorded and subjected to statistical (chi-square, ANOVA, and Pearson's r , as well as the SPSS programme) tests to determine the relationship of those elements to ethnicity and thus establish a model of statistical patterning for use by archaeologists when examining such houses in the archaeological record.

Hypotheses

The second purpose of this study may be stated as a null hypothesis (H_0) to be tested, namely:

H_0 that there is no (non-random) relationship between ethnicity and house attribute patterning, or, that the critical values for each correlation of attribute to ethnicity will exceed the χ^2 or ANOVA statistic calculated, with an alpha level of probability of 0.05.

Two other models of attribute patterning were also tested to act as controls on the ethnicity model by exploring alternate relationships for any patterning. The other variables tested were date of construction of the house by decade, and area (town) of construction of the house.

The null hypotheses tested in these instances were:

H_0 that there is no (non-random) relationship between date of house construction and house attribute patterning;

H_0 that there is no (non-random) relationship between area of house construction and attribute patterning.

Before examining the methodology employed in testing these hypotheses, it is first necessary to define the terminology and composite parts

(variables, attributes, and sample conditions) of the study more fully.

Definition of Terms

Alberta

The first term to be defined as it is used in the purposes of this study, opens this chapter, namely "Alberta". As stated, at the point of the term's first use, it is to apply to the geographical area and province now bearing this name. It is understood that during the period considered within this study (1880-1920) Alberta did not necessarily exist in its present form. Its name changed from the North-West Territories to Alberta, and it achieved provincial status within the study period. Geographical boundaries for Alberta also changed during this time.

These changes do not affect the study since the study area remained within the same parameters regardless of the name they bore. For the sake of convention, therefore, the study will be said to have been conducted in Alberta, and any references to Alberta are made in this context.

Settlement

"Settlement" is herein used to refer to that settlement of Western Canada, and specifically Alberta, which occurred in the nineteenth and early twentieth centuries, involving persons primarily of European heritage, and who established societies with economic bases in sedentary agriculture and husbandry, trade and industry. This definition is made to clarify the seeming ethnocentrism inherent in the omission of the lifeways of Alberta's Native Peoples prior to and within the study period from inclusion in this concept of the settlement of Alberta.

The bases for use of this term in this study are, therefore, temporal,

economic, and ethnic.

Ethnicity

There have been various definitions proposed for ethnicity (Barth 1969; Naroll 1964; Wells 1975) which consider such factors as language, kinship and identificational boundaries.

In the nineteenth century, political boundaries influenced and combined the above concepts of ethnicity. For example, the political entity-the United Kingdom united English, Scottish, and Irish peoples all under one heading-British. Likewise Sweden contained what are now Sweden and Norway until 1905.

For the purposes of this study, the ethnic groups considered are those which were represented in Alberta at the turn of the century using those political terms found on pages 20-21.

Vernacular Architecture

Ethnicity has been defined so that it may be determined if it is reflected in the vernacular architecture represented by Alberta's farmhouses 1880-1920. Just as "ethnicity" needs definition before investigation, so does "vernacular architecture" so that the decision to study the farm houses of Alberta's settlers may be seen to be inclusive in this term.

The term "vernacular architecture" is open to interpretation on two counts: 1) whether vernacular architecture may be classed as architecture and 2) the parameters which define vernacular.

Boddy addressed the first of these points when he said, "it is not possible to say exactly when architecture supplants building, when the conscious accretion of meaning is added to mere built forms and when art is added to artifice" (1982:25). This may indeed be a subjective decision for the researcher, but as with others, it must have a sound

base. For this study, the assertions of Rapoport, the observations of Fish, and the definitions used by Fodchuk and employed by Alberta Historic Sites Service (whose records were used in researching this study sample) staff were used to establish that base.

Rapoport asserted that folk building traditions were "the direct and unselfconscious translation into physical form of a culture" (1969:2). By this definition, Beaux Arts or Bauhaus building traditions may be seen to differ from folk building only in the absence of unselfconsciousness. Further, Rapoport asserted that the folk tradition of building "represents the bulk of the built environment: (ibid.). As such, attention is demanded for folk buildings as much as any other by virtue of the quantity of examples. These are, therefore, accepted for this study as a valid, if maligned category of architecture - with a proviso.

The proviso is illustrated by the observations of Fish in 1910 which provided a mandate for this study. Again, he noted "on the whole, the primitive log cabins were necessarily much alike" (in Schuyler 1978:9). That is to say that the first immediate shelters built by settlers - the soddies, shacks, shanties, and dugouts may be categorized as buildings rather than architecture, to use Boddy's terms. They were built to answer an immediate necessity for shelter, not necessarily to translate culture into physical form. This "translation" came later when a building which represented the concept of "house", as opposed to merely "shelter" was constructed. And these, as Fish went on to note, were the structures he saw to reflect ethnicity (ibid.).

Indeed, the dwellings researched and recorded by Fodchuk for the Alberta Historic Sites Service for selection as representatives of

Ukrainian settlement farmsteads were those termed "permanent dwellings" (1978:2). These, therefore, were the dwellings to be considered for sample selection for the purposes of this study. Those permanent dwellings which were the houses of the settlers, not just their shelters, were considered to meet the definition of architecture rather than building.

The second question then remains as to which of these forms of architecture were vernacular. This requires a definition of "vernacular architecture".

One definition states:

Vernacular architecture will have been designed by an amateur, probably the occupier of the intended building, and one without training in design; he will have been guided by a series of conventions built up in his locality, paying little attention to what may be fashionable or international in scale...even the most sophisticated design in a provincial town may be carried out entirely in local materials and so include some slight vernacular quality, but a rough distinction can in practice be made between those buildings which have vernacular or polite qualities to a greater or lesser degree (Brunskill 1971:26).

However, another observation seems to contradict the above:

When a tradesman builds a farmhouse for a peasant, they both know the type in question; the form or model, and even the materials. What remains to be determined are the specifics - family requirements (although this is also less variable than is true today), size (depending on wealth), and a relation to the site and micro-climate. Since both tradesman and peasant

agree on what is wanted, there is, in effect, a model which is adapted as one proceeds; this is as true of the Danish farmer as of the French or Yugoslav peasant (Rapoport 1969:4).

That is to say, Rapoport, unlike Brunskill would consider a building still to be vernacular if it were built by a skilled worker for a person ("peasant").

This is again an issue for decision, particularly in research about the nineteenth and early twentieth centuries with their attendant industrialization and resultant standardization of products including building materials, and in some instances, houses themselves.

Brunskill argued that the nineteenth century marks a point - a "polite threshold" in his terms, after which buildings may no longer be considered vernacular, but are part of "polite" architecture (Brunskill 1971:26).

As stated, Rapoport did not feel that the introduction of skilled workmen into the building process altered the definition of vernacular architecture. Further, Glassie supported this assertion, as he acknowledged that the nineteenth century had an impact upon domestic architecture but did not change its status as vernacular. He, therefore, coined the term "mechanical vernacular" to describe this form of architecture (Glassie 1975:180).

This issue (i.e. whether there is a cut off point for the use of the term vernacular) continues to be unresolved. Professionally designed buildings for public as well as private use have continued to be referred to as vernacular by some authors (Bayer 1982; Heimann and Georges 1980; Sculle 1980) while others avoid the use of that term in favour of acknowledging early trends in phases of design as having

vernacular qualities (Vieyra 1979:xiii). The differentiations seem to fall into two main but merging factors: locale and level of design. "Vernacular" has been used for public, architecturally designed buildings (gas stations) which nonetheless reflect local tastes and traditions and are the earliest as well as locally unique forms of the building type (Bayer 1982:15). The use of the term diminishes as international styles controlled by a distant parent company are employed locally. However, increasing industrialization and communication which were in force at the turn of the century brought international tastes to local builders, and obscured the boundary dividing folk from professionally designed architecture. This boundary approximates Brunskill's polite threshold.

The boundary may be seen to be contextual rather than temporal, however. Architectural forms which still indicate local, common (i.e. ordinary) trends may be seen to be vernacular whether they be gas stations, houses or offices. Those forms which concern themselves primarily with broader ("international") style - which are self-conscious in Rapoport's terms may be seen to have gone beyond vernacular forms into architectural design even if they are forms which are commonly found in the built environment (houses, offices).

It has been seen that the use of the term vernacular remains debated in present literature. For the practical purposes of this study, however, the term is applied to houses built during the study period and within the study area, either by or for the building owner. That is, the views of Rapoport and Glassie were favoured over those of Brunskill in the given contexts of the study, since it

was felt that such architecture remained a vernacular reflection of the mental template guiding the owner's perception of "house".

Attribute

The manifestation of a perception of "house", in this case a house which was a vernacular permanent dwelling, contained a variety of elements. These elements, or building parts and construction details (e.g. roof, doors, orientation) are the units which may be utilized in determining whether, as a whole, in a group (i.e. the house) they are so arranged as to reflect ethnicity. These units or elements will be termed attributes for this study, according to the definition of attribute given by Clarke (1968:156) as a "logically irreducible character of two or more states [e.g. present/absent, or black,red, green] acting as an independent variable with a specific frame of reference".

The attributes of the houses were to form the basis of recording of the houses for analysis with respect to relationship to ethnicity.

Methodology

With the terminology of and motivation for the proposed study thus defined, the actual method for conducting such a study will be examined. First, the overall methodology for such a study in general, and then the guidelines for this study in particular will be discussed.

It has been stated that in order to note a relationship between ethnicity and houses of the settlement period, this study should base its conclusions on firmer grounds than those employed by previous studies.

Statistical Sample

A statistical analysis will, therefore, be employed to lessen the degree of subjectivity upon which such conclusions may be founded.

In order to conduct a statistical test incorporating the stated purposes of this study, there are matters of statistical theory which must be considered. It would be feasibly impossible to conduct a statistical test on every vernacular settlement period house in Alberta (i.e. the population of such houses) without unlimited time and finances. Given both finite time and finances for the study, and that the total population is an unknown quantity, it is, therefore, necessary to decrease the number of houses for analysis; that is, to obtain a sample. In the context of statistics, it is generally assumed that samples are random. Zar states this premise:

...to reach valid conclusions about populations by induction from samples, statistical procedures typically assume that the samples are obtained in a random fashion. To sample a population randomly requires that each member of the population has an equal and independent chance of being selected...[and] the selection of any member of the population must in no way influence the selection of any other member " (1974:16).

Within the framework of a study conducted under archaeological auspices, the strictures of random sampling as defined above may not always be achieved. Paraphrasing Orton, this may be explained in that "house selection may depend mainly on the friendliness of landowners, and very little on sampling theory" (Orton 1980:22).

Cowgill elaborates further upon the factors which affect the selection of an archaeological site, which in this case may still be termed historical, but which the factors still affect, namely:

a) the complex, ever-changing characters of any human society and its territory that together must be considered the source

of meaningful archaeological populations;

b) the partial and erratic reflection of (a) by material remains;

c) the partial and erratic survival of (b) through time;

d) the partial and erratic discovery of (c) by chance.

(Cowgill in Doran and Hodson 1975:96).

These observations, therefore, post the problem of whether statistical analysis of sample data will reflect a population validly. The term "haphazard sampling" was, therefore, developed by Zeller and Carmichael (1978:187) to describe selections made on the basis of availability. They point out that this method has a limited usefulness because of the gap which exists between a thus hypothetically created population and a real population (ibid.). Thomas also acknowledged this problem but addressed its applicability for archaeological work in the following manner:

As an Anthropologist, I am entitled to extend my findings as far as I wish provided Student's caveat "under similar conditions" can be defined...The boundaries of this hypothetical population are defined on nonstatistical grounds and must be justified as such ...The critical difference between actual sampled populations and hypothetical populations existing under similar conditions enables the anthropologist to do a great deal of meaningful inference, even though the sample is not random (Thomas 1976:443ff).

Similarly, Doran and Hodson (1975:96) noted that archaeological samples may not be random but rather selected. Their warning is to treat the sample as a finite population and treat statistical procedures as descriptive rather than inferential (i.e. predictive) (ibid.).

On the whole, this situation was the one chosen to be observed for the purposes of this study. The statistically created models are to be descriptive of the sample. However, as Thomas mentioned, inferences are to be drawn from these as to preferences exhibited through house attribute patterning.

Statistical Tests

After the sampling criteria are established, those statistical tests which suit the stated purposes of the study and the types of data collected must be determined.

Tests for this study must, therefore: 1) be capable of testing a null hypothesis in which the randomness of the relationship between variables is at issue; 2) be capable of doing so by using nominal data (i.e. data which are described, not measured, e.g. colour, shape, location); i) be capable of doing so by using at least interval data (i.e. data which can be counted or measured on a scale) but such that; ii) the test is similar to that used on nominal data in terms of power and results because, as defined by Clark on page 14 and stated by Sokal and Sneath (1963:51) and Shepard (1954:335), attributes have been assigned equal weights. Therefore, tests conducted on the different attributes should also be as equal as possible in order that resultant statistics are comparable, and to avoid a priori assumptions about attributes (e.g. deciding before testing that "length" will be a more powerful attribute than a nominal attribute, and, therefore subjecting it to a more powerful test); 3) illustrate attribute patterning; 4) be capable of analysing data gathered from more than two samples (ethnic groups) of houses.

Using the above criteria, the tests most appropriate would be the

Chi square (χ^2) test for nominal data and correspondingly, the Oneway Analysis of Variance (ANOVA) test for interval data. Statistics indicating preferences and central tendencies, namely mode, and mean values of attribute frequencies and measures may also be used on both sets of data to describe preferences for attributes and illustrate patterning in deference to Thomas' comments above. Frequency information is also required as a prerequisite to the calculation of χ^2 and ANOVA statistics because, roughly explained, these statistics indicate the randomness of a relationship between variables using observed frequencies (χ^2) or means (ANOVA) in relation to expected frequencies or means (as calculated by conventional formulae). The statistics thus calculated are compared to statistics (critical values or F-ratios) arrived at for a test under similar conditions on the basis of normal distributions. A χ^2 or ANOVA statistic larger than the critical value or F-ratio value indicates a non-random relationship. For the normal distribution to which the used formula for the χ^2 test and its resultant statistics apply, the degrees of freedom are assumed to be no greater than 30 (Hinkle et. al. 1971:337). Roughly translated, this assumes a sample size (the number of houses in each ethnic group) to be 31 or less, to be a valid statistic. The formulae in question will not be detailed in the context of this discussion since they are common and standard for such tests, and their explanation would unduly delay the text of this study. However, they may be determined by consulting any number of texts about statistics, such as Hinkle et. al. (1971), and Zar (1974) cited thus far.

If no meaningful statistics are produced using these statistical tests, an effort may be made to address this by collapsing the number of attributes or variables which are being tested. For example, 12

towns may be collapsed down to four regions. Information may be lost, but a relationship is tested, and the results may be considered valid so long as one quarter of the expected frequencies are not lower than 5 and none is less than 1 (Baker and Lee 1975).

A computer programme, specifically the Statistical Package for the Social Sciences (SPSS) (Nie et. al 1975) facilitates the calculation of the above statistics and the storage of encoded data. This programme is available at the University of Calgary as part of its computing services for its computer (of 1982) a Honeywell DPS, using Multics Release 8.2.

Study Sample Selection Guidelines

The terminology has been defined and it has thus far been determined that the study would encompass farmhouses of various ethnic groups in Alberta, built during the period of its early settlement. Further, the sample size for each ethnic group's number of houses should be 30 or less so that the sample may be validly analysed statistically. The specific details regarding sample selection, e.g. which houses of which ethnic groups, using which attributes, and the area and time frame of study may now be explored.

House Owners

It has been stated on page 11 that the houses selected were to be the permanent dwellings (i.e. those houses considered to be in their finished state before 1920) of the settlers. In addition to the constraints put upon house selection, there were conditions for owner characteristics. So that the houses selected would be compared on similar bases, owners were assumed to be similar when this was controllable. Specifically, the owner was to be a farmer, part of a family (here defined as a group of

two or more persons sharing accommodations). These conditions were set to eliminate single person dwellings from the comparisons. The common occupation of farmer does not fully control for social status, since owner income (and its reflection in house attributes) was not controlled. Rather, it was assumed that the influence of owner income would be randomized throughout the sample (i.e. that the houses of both wealth and non-wealthy farmers would be selected without regard for that factor).

Further, the owner had to have been an immigrant to Alberta, having spent no more than five years in transit to his/her Alberta home (allowing for immigrants who came via the U.S.).

Ethnic Groups

The specific origins/ethnic affiliations of these immigrants, i.e. the particular ethnic groups selected for study were chosen after consultation with the census figures relating to Alberta's settlement (see Table 1). These figures indicated that the British, German, Ukrainian and Scandinavian were the most numerous groups to settle in Alberta, and, therefore, likely to have extant the required number of sample houses. The French-Canadian group was added to these because it was represented in the census figures of 1886 (Canada 1886:15), indicating that it was present as a distinct group. As well, out of interest, there was a desire to test whether Canadian ethnicity would be exhibited in vernacular architecture as might European ethnicity.

On these grounds, and bearing in mind that present and nineteenth century nationalities differ, the ethnic groups chosen for study may be defined as follows:

British - English, Scottish, Irish

French-Canadian - Canadian Francophones (e.g. Québécois,

New Brunswickers)

German - German, Polish-German, Russian-German

Scandinavian - Swedish, Norwegian

Ukrainian - Ukrainian (Galician, Bukovinian)

Dates

Linked to the selection of ethnic groups is the selection of the time frame in which the houses of this study are set. Decades were decided upon as units of time to be used for the sake of convenience. The specific decades chosen were to be those for which each ethnic group was represented in Alberta. The earliest census figures published were those of 1886. These indicated the presence of members of each of the five ethnic groups in Alberta with the exception of the Ukrainians (Canada 1886: 15). It is recorded, however, that Ivan Pylipiw - a Ukrainian immigrant, was present in Alberta in 1889 (UPA 1975:19).

The 1886 census figures for Alberta further record the presence of 3,000 rural dwellings (Canada 1886:15). A sample size of 30 houses would feasibly include houses of this number since 30 is only one percent of houses then extant.

Later census figures show that immigrant populations increased in the two decades following the 1880s (Canada 1907; 1913; 1915). It may be assumed that the number of houses built which may feasibly be sampled also increased. It should be noted that French-Canadian populations are not reflected in published census figures after 1886. This may be due to their categorization as British subjects because they were Canadian. It is assumed, though, through the continued presence of Francophones in such centres as St. Albert, Morinville, St. Paul,

and Lac La Biche, that the French-Canadian population of Alberta did not die out after 1886.

The 1880s were, therefore, taken as the initial study decade, and the terminal date of 1920 was chosen for the following reasons:

1) it coincides with a decennial division of years; 2) similar studies on file in Ottawa with the Canadian Inventory of Historic Buildings use 1914 as their terminal date (Humphreys 1977:45). So that this study may be compared to others, if so desired by other researchers, the decade including the year 1914 was incorporated into the study and ends, therefore, with 1920; 3) the year 1920 has been determined to be a date after which mechanization came to a fore in Alberta and altered architecture, both in terms of a change in building materials and in types of buildings constructed (e.g. machine sheds) (Fodchuk 1978:2).

Location

The location of the study area (see Figure 1 and Figure 2) in a central corridor of Southern Alberta was chosen to allow for relatively similar conditions in availability of building materials. This could not be controlled for entirely, but it is assumed on the following grounds:

- 1) Railway lines provided access to most centres in the study area in the first two decades of the study time frame, but to all areas by the terminal date for the study (1920). Therefore, any permanent sample houses could have achieved final, permanent status by that date, and with access to rail delivered building materials.
- 2) Sawn lumber and bricks were available, or with rail or trail access to the study area within the period studies (for examples of which see Tables 2 and 3).

- 3) The influences of at least one major centre on architecture and supplies (Edmonton, Calgary, Lethbridge) could be felt within a similar 2-3 days travel time from most points of the study area.
- 4) Each site within the study area was located in proximity to usable local timber for building as observed in the Atlas of Alberta (Government of Alberta 1969:31). Access was assured by the timber rights section of the Dominion Lands Act (Canada 1872:70ff).

Theoretically, therefore, each house location had the choice from among local wood supplies, manufactured wood and building products, and other building products such as brick. Each house may, therefore, represent the conscious decisions made given the availability of these supplies before 1920.

One other reason is given for the choice of study area - namely, practicality: it was an area which could feasibly be recorded by one person within limited time, and which was accessible for travel.

House Selection

Once the above sample guidelines had been determined, an actual selection of houses was made to suit the stated conditions.

Local histories of the study area were consulted for information and included: Alix Clive Historical Clubs (1974), Chestermere Historical Society (1971), Circle 8 Historical Society (1981), the Dinton Women's Institute and the Gladys Women's Institute (1965), Fencelines and Furrows Historic Book Society (1971), Gleichen United Church Women (1968), Kinette Club of Didsbury (1969), The Old Timers Association Committee for the Album (1958), Stout (1956), Three Hills Rural Community Group (1970). In addition to these, sample houses were located using the Alberta Culture Historic Sites Service Historic

Sites Inventory (N.D.), and the personal research files of Mr. Radomir Bilash of the Historic Sites Service.

Each house selected was the subject of further investigation of oral history sources (e.g. owner, relative of builder, neighbour) for corroboration of information, such that each house received at least two confirmations of its identity.

Reliance had to be made upon non-"primary source documentary evidence" in addition to those primary sources available and applicable to this study for reasons of time constraints, and as exemplified below:

- 1) Census information detailing individuals is not published until one hundred years after being taken, which does not include all decades of the study period.
- 2) Homestead patents and records were not always carefully filled out, nor do they necessarily indicate ethnicity of settler (since many naturalized as "British" to claim patents). Further, they may not indicate whether or when a permanent house was built. Also, the first permanent house on a given property need not have been built by a homesteader but by a settler following him/her.
- 3) Land title records proved prohibitively expensive to examine, and again, would not render construction of permanent house information had they been used.
- 4) Tax assessment records were lost (due to fire, flood, never having been kept) or filed in such a state as to have made retrieval of information impossible within the limited time for the study research, in each location selected for study. Had they been available, they would have been open to subjective interpretation of the building of a permanent house according to the builder/owner's concept.

Houses were, therefore, selected on the basis of sample guidelines as outlined above, and at least two sources of information were used to gain the background needed to record each house.

Recording of Attributes

The attributes chosen initially for recording houses were those of the Canadian Inventory of Historic Buildings (CIHB) (Bray et. al 1980). It was felt that this study should use a similar format and set of conventions to other such work so as to facilitate any future comparative research and allow for some standardization of existing terminology in this area of research. Also, CIHB recording forms take in most of the same considerations as those recording forms used by the Alberta Historic Sites Service, such that comparative work could feasibly be done using these documents as well.

The CIHB attributes were modified for this study such that:

- 1) Some terms changed meaning, and where this applies, it is outlined in Chapter 4.
- 2) Categories for recording were added which were significant to a study of ethnicity in architecture, after consultation with Brian Melnyk and Radomir Bilash of the Alberta Historic Sites Service. These included house orientation, farm layout, proximity to out-buildings, shrubbery, heating and plumbing, as well as some attribute states such as presence of mud plaster or lime wash.
- 3) Categories for recording were expanded so that they would be more relevant to archaeological studies of the entire structure rather than merely the main facade as dealt with by the CIHB. Therefore, attributes preceded by the word "other" were created to indicate

other than solely the main facade, window, door, etc. Other attributes such as "number of windows" were created as well to apply to the entire structure.

The houses were recorded using this format, and additions were made to it during the recording process when the format proved inadequate to describe the given structure (e.g. The code did not include mud plaster so this category was added and noted). The results of the final selection of attributes recorded are represented in Figure 3. They may be expanded upon and added to by future researchers, if required. It is hoped that, in future, such recording may take into account the archaeological perspective which requires information about buildings in their entirety, and with a view to those attributes which reflect human behaviour and will be found in an archaeological record.

Houses were thus located using above mentioned local histories, government sources and oral histories. Once located by Dominion Land Survey notation, the present owners of the land were determined using Township maps and land records. They were then contacted in order to arrange to examine the houses. Various persons were consulted prior to, during and after the examination of the house. They included the present owner of the house, other past owners of the house, relatives of the original owners, neighbours of the above and area residents. The information from these persons and any other documentary or related evidence was used to assemble a history of the house structure in its pre 1920 state so that only those attributes would be recorded. Houses were examined and recorded bearing this information in mind. First hand examination of the buildings often answered unsettled questions such as alterations to basement foundations, interior wall

material (often noted at corners and door jambs). It was not possible to damage extant houses to be able to examine interior wall structure so that these attributes went unrecorded, or the information of oral history sources had to provide the information. (It is recognized that oral history sources may be inaccurate, but it has also been shown that written sources may also be so, or inapplicable). The decisions outlining which were the pertinent attributes to record were made by the recorder on the basis of the above sources.

Each house was recorded individually by the author on an encoded form which corresponded to the recording code (Figure 3). Nominal attributes may be seen to have been assigned numerical values and it was these which were noted on the forms. In addition, numbered or measured attributes were recorded in which case the numbers denote interval or ratio value numbers, not encoded attributes. It should be noted that metric and Imperial measurement units both appear on the forms since metric attributes are used for modern research, but the houses were themselves built in British units.

Photographs were also taken when possible, and are on file with the raw data for the study.

Recording was done in the autumn which would not be recommended for future research. Inclement weather delayed and hampered recording. Farmers/landowners were often engaged in harvest activities and difficult to contact. Perhaps spring or summer would be better.

Using these methods a record of each house was collected in numerical form and these values were entered onto computer for storage and later statistical analysis.

Summary

This study, therefore, uses the suggestions entailed in historical archaeology as mandates to record material culture in a manner which can provide useful information regarding the subjects of study, and for archaeological research.

The vernacular farmhouses built in Alberta 1880-1920 by members of British, French-Canadian, German, Scandinavian, and Ukrainian ethnic groups within a given area are those examples of material culture. They (150 in all, or 30 houses of each of the five ethnic groups) were recorded on the basis of house attributes, drawn largely from the CIHB house recording system, and the resultant data (see Table 4) analysed statistically (see Tables 6-9) to determine whether ethnicity were reflected by house attribute patterning, and if so, which patterns that might be present. Any established patterns may be used to direct or assist archaeological investigation of such houses once in the archaeological record.

CHAPTER II

SETTLEMENT BACKGROUND

In order to fully comprehend the choice of dwellings built by the farmers of Alberta, it is necessary to establish and examine those factors which may have influenced that choice.

Chapter 1 presented several factors such as availability of materials, date of construction, transportation of materials which were controlled for, as possible, throughout the study. There were other factors, however, which require an examination of the historical background of the settlement of Alberta by the ethnic groups in question and on examination of the architectural traditions which they brought with them. Through such examinations, the influences inherent in a particular ethnic group's choice of dwelling may be noted. That is, these may be among the factors which determined whether ethnic visibility would exist in the settler's dwelling, and if so, which forms it may have taken.

The settlement of Alberta, along with the rest of Western Canada, was dependant upon several factors which worked in conjunction to draw people around the world onto the Canadian prairie.

In Canada itself these included geographical, industrial, economic, and political factors. The development of hardy and quick growing Red Fife and Marquis wheat strains in the 1890s and 1911 respectively assured the Canadian prairies of acknowledgement for its agricultural potential. With the land inviting settlement, what was required were inducements and information to bring these factors to the settlers' attention. Also required was the actual physical means of bringing

those so induced to Western Canada. Certainly, the Canadian Pacific Railway (CPR) played a most important role in these regards, along with the Canadian government and its agencies. The "opening of the west" by means of railroad expansion is a factor noted and considered in the undertaking of this study. "There was an easily perceptible relationship between recorded immigration and the annual increase in railway mileage" (Bicha 1968:94). Bearing in mind that the railway brought settlers, and determined the areas which would be settled (i.e. areas with railway access), the study area encompassed ethnic communities with similar (distance and year) access to the rail lines and, therefore, to building materials shipped by rail. The mere physical presence of track was not the sole contribution made by the railway companies to western settlement. Their contribution to western settlement was massive:

Up to the end of the year 1924 it (CPR) claimed the direct responsibility for the settlement in western Canada of some 55,000 families, who occupied and cultivated 30,000,000 acres of land. Since its inception, the company had spent nearly \$75,000,000 for colonization, land settlement, irrigation or similar works - an amount exceeding that spent by the Dominion government on like work in the same period (Martin in Silver 1938:38).

Not only did the railway company (referring here to the CPR since during the period of the study this company monopolized rail transportation in Alberta, controlling its main competitor - the Calgary and Edmonton - C & E Rail Company) set up its own colonization

companies which sent agents to recruit then place settlers on the land, but it offered these settlers many other services and considerations. In some instances, camps were established to "break in" settlers new from Europe into the regions of Canada and offer them farm training, and blueprints were created for farmers for such things as farm houses and barns (CPR 1926). Building materials for these were shipped at low per box car rates of \$20.00 to \$25.00 (Walker 1884-1903). Similar low rates applied to settlers' effects. There was a one-box car set rate for farm equipment and a cubic foot allowance for personal property brought when immigrating (Canada 1881:48). The box car limit was static, but assurances were given in government literature that "excess luggage (unless very bulky) is seldom charged for" (ibid.). Fares were also lowered. For example: "During the early 1880s the CPR rate for second class from Montreal to Winnipeg was \$17.70. But for emigrant settlers there was a special rate of \$15.71" (Silver 1966:51).

The benefit of the railway to western settlement may be accepted with some chagrin. Any altruism guiding the railway was tempered with the profit motive, such that for building track, the company received grants of land in the west. That is, odd numbered sections in areas 12 miles from a projected line, to be sold at \$92.00 per acre (Silver 1938:74). Land grants were thus sold to the settlers which the railway companies brought to the west. This arrangement actually acted to hinder western settlement because the rail companies tended to hold onto their sections of land in anticipation of higher selling prices. Speculation such as this combined with farmers' disinclination

to buy land if they could homestead for the nominal \$10.00 fee, left large areas of land unsettled. The Canadian government finally acted, and in 1904 introduced legislation which disallowed the continuance of the CPR odd numbered sections grant, and instead by 1908, established these sections for pre-emptions - or land to be sold just to neighbouring farmers at a set price of \$3.00 per acre (Martin in Silver 1938:333).

The Canadian government saw the settlement of Western Canada as its own policy and sought to preserve its own desired goals. These goals were: the settlement of Western Canada by people who would be readily assimilable as loyal Canadians, work hard for the economic prosperity of Canada, and act as a bulwark against American expansion in western North America. The Riel provisional governments, and Fenian raids had focused attention on the West. Railway construction provided access to the area.

The Dominion Land Act instigated a land survey undertaken in 1872, and amended several times thereafter (1898, 1901, 1908) was based upon the American system of "Public Dominion". The Canadian government made modifications to this system such as to survey the land prior to settlement and to change the pattern used in the American layout system. The land was thus laid out in the pattern of:

quadrilateral townships, containing 36 sections of one mile square each...together with road allowances of one chain and 50 links in width, between all township sections (Canada 1872: XXIII, 3.1).

Sections contained 640 acres and were further divided into quarter sections of 160 acres each (op. cit: 15:1, 2).

With the land thus surveyed, the government used the section as the basis for farm settlement and land grants for government (e.g. schools) and industrial (timber, mining) rights. Homesteading was established as a government sponsored programme under the following conditions:

[The homesteader] a) applies for a patent to homestead a quarter section of land and deposits a fee of \$10.00 with the government land surveyor office; b) establishes a residence (home) upon and cultivates the land for six months in each of three consecutive years; c) may live within nine miles of this homestead on a farm of at least 80 acres solely owned and occupied by him or his father, mother, son, daughter, brother, or sister (op. cit: 33 (1-18); Fencelines and Furrows Historic Book Society 1969:22).

Land was thus made available under government auspices, and for such a nominal fee as to be considered "free". Free land was one form of government inducement to settle Western Canada. Although the land was "free", the travel equipment and chattels required were not. These obstacles were further lessened by the Dominion government which removed customs duty on settlers' effects, and in 1881 allowed for financial assistance (not to exceed \$500.00 at 6% interest) to the homesteader by non-government agencies, and this opened the way for the formation of charitable and/or profit-making colonization companies (Silver 1938:76).

The government established its own colonization company to advertise Canada's land and further induce settlement. With the accession of the liberal government of Wilfrid Laurier, and the appointment of Clifford

Sifton as Minister of Immigration in 1896, western settlement crystalized into a forthright government policy. The colonization agency which had been in existence was increased dramatically, and reorganized. It was successful enough to be the model of the railway colonization operations. Salaried agents were sent out to the United States at first, to call on individual farmers and/or give lectures to groups of farmers and prospective settlers and sign them up for government funded tours of Canadian farmland prior to their hoped for immigration to Canada. By the end of the 19th century, immigration solicitation had increased in the U.S.A. such that the Canadian government appointed American farmers to act as sub-agents and provided a fee of \$3.00 per man/\$2.00 per woman/\$1.00 per child who immigrated to Canada (Bicha 1968:44). Employment of agents to bring in colonizers was not a new practice in this era. The Canadian government had, as early as the 1880s, arranged a per head payment of \$17.00 per colonist to Roman Catholic priests who solicited immigrants from the French-Canadian populations in the U.S.A. (Silver 1966:45). However, this system was not without its flaws. Often, agents acted for several parties at once and sought colonists for the party paying the largest commission (Plant 1951:56). Such was the fear of the Canadian government in regard to the agents it employed in Britain, whom Canada felt were sending settlers to Australia and New Zealand. As a result, Canadian agents were sent from Canada to the European centres to attract settlers to Canada. These men included Mr. C.O. Swanson - sent to the U.S.A. and Sweden, Mr. Andrew Schmidt - sent to Sweden, Mr. W.T.R. Preston, who was, in 1899, Inspector of Immigration

Agencies in Europe and was sent to the Ukraine. As well as their duties as immigration agents and liaisons between colonization boards, agencies, and help groups (e.g. churches, companies, citizens' groups) and personnel in Canada, these agents were to advise the Canadian government about the quality and quantity of emigrants so that government policy could be set. The influx of immigrants was so rapid that government policy actually remained haphazard in many respects. Prior to 1910, there were minimal restrictions on entry to Canada. "Between 1903 and 1909, 149 immigrants from the U.S. were refused entry or deported" (Bicha 1968:83). Although up to this time, the only stated government grounds for denial of admission/expulsion were criminal (including pauperism) or medical background of a settler, there was, nonetheless, a preference given to some immigrants over others. This became particularly true after the 1910 'clamp down'. Black immigrants from the U.S. were deemed unsuitable. One of the more obvious examples of this system was the expulsion of German immigrants from Canada during the First World War. Germans were not reinstated to "preferred status" till 1927 (Multiculturalism Directorate Department of the Secretary of State 1979:92). "Preferred" referred not only to matters of supposed national security but to the policy of assimilation. The mosaic concept about today's society had no place in the immigration policy of the turn of the century. Preferred immigrants were hardworking and would easily become Canadians - British Canadians in particular, as demonstrated by the following quotations - the first by W.T.R. Preston in his capacity as Inspector of Emigration Agencies in Europe, the second addressed to Anglophone

teachers posted to settlement areas: "Galicians may be recommended as immigrants. They are thrifty, industrious, and once exposed to Canadian freedoms would quickly be Anglicized" (GIA 1900:5).

Yet if we leave our new Canadians undisturbed, in their old customs and ways, neglect their education, deny them the pass-word to our civilization, the power of understanding our language, the ability to assimilate our culture; if the invitation card to our Canada be withheld, it will result one day in a vastly increased electorage [immigrants having a high birth rate] incapable of understanding our needs, hammering at the door of our civilization, demanding freedoms and rights coloured by their memories, traditions, and restricted lives" (England 1929:10).

With assimilation of immigrants as a major goal, the government of Canada nonetheless vacillated in another area of settlement policy - namely block settlements. On one hand, block settlements of a particular ethnic group were viewed as a good thing since they provided moral support for settlers and allowed for easier application of government services and assimilation efforts such as schooling. Paradoxically, they concentrated one ethnic group in one area, and made assimilation endeavours much more difficult. The Laurier government, following 1896, recognized the impossibility of stopping block settlements, which were favoured by the immigrant groups themselves, and so formulated policy to disperse block settlements from a single concentrated area. A commissioner of immigration was empowered to assign a destination to any immigrant without a fixed one (as per Schlichtmann 1977:44).

Despite fluctuations in aspects of settlement policy, partly as a function of dealing with a tidal wave of immigrants in a short period of time, there was an overall goal of settling Western Canada with "assimilable" immigrants. To this end, the government and its agents (including here, the railways) offered many inducements for emigrants to homestead, and settle in Canada's west.

Yet, these inducements alone did not account for the immigration to Canada which took place at the turn of the century. There were several factors, primarily economic, which influenced the emigrants within their own countries, and prepared them so that the Canadian overtures fell on welcoming ears.

Europe of the mid and late 19th century had been the scene of several wars and much economic hardship, the Irish potato famine being the most dramatic example of the latter. Industrialization also left many people unemployed or living in squalour. Emigration was firmly established in the eyes of the European populace in such times as a sometimes necessary route to alleviate poverty and to escape strife. This reasoning may be seen in the following:

From 1868 to 1914, more than one million Swedes immigrated to the U.S. and Canada. A large proportion of emigrants had been landless labourers and the sons and daughters of small farmers who stood no chance of inheriting a title to family land. A series of crop failures from 1866 to 1868 brought starvation and economic hardship to many parts of Sweden (Multiculturalism Directorate Department of the Secretary of State 1979:211).

Very similar conditions have been noted as existing in Britain, Germany, and the Ukraine (Plant 1951:24; Huebener 1962:61; Multiculturalism Directorate Department of the Secretary of State 1979:223).

Canada was not the first choice for the majority of emigrants. Rather, it was the U.S. which received the bulk of these people. As an example of which: "86 per cent of the whole emigration from Sweden in the period 1881-1890 had the United States as its goal" (Nelson 1943: 336). Immigration to the United States varied as per the fluctuations in the American and European economies according to Huebener (1962:134).

That is, when the European economies sagged, the American economy was generally one of prosperity. Given such conditions, it is no wonder that the Canadian government sent agents to Europe and especially to the U.S. to tap this flood of people. Had economic factors not favoured Canada over the U.S. in several instances during this period, it is questionable how successful the Canadian agents would have been. At the onset of the twentieth century, Canadian grain crops were recording record yields, and receiving record prices. At the same time, the U.S. underwent a number of economic downturns. Further, immigrants to Canada were offered an opportunity for a fresh start and advancement compared to immigrants to the U.S. who had found indebtedness, or a low paying lifestyle as a domestic or farmhand. It was not possible to remedy this situation within the United States at the turn of the century because most of the "free land" there had been settled. The Dominion Lands Act made this a viable option in Canada, however, by opening up its "free land" (i.e. for the \$10.00 homestead fee and the meeting of attendant conditions) Canada offered one more

thing - political stability, especially in view of the U.S. Civil War, still real to memory, and the fact that the Canadian government had overcome the Riel-led strife.

The Canadian option, therefore, was one which would have appealed to peoples seeking independence, a better life than they had previously known, and relative stability. Generally, then, these were the motivating factors for the settlement of Western Canada. They speak of the kinds of people and the mind sets of those people who immigrated, and offer preliminary clues of the kinds of human factors to have influenced immigrant housing. Each ethnic group studied, of course, had its own viewpoint in regard to the settlement process, and its own particular settlement history/pattern in Alberta.

British

British emigration to Canada was commonplace by the end of the nineteenth century, and was controlled as much by the government policies of the U.K. as those of Canada. Colonization was seen by the British as a British solution to British overpopulation, unemployment, and debt. It also provided markets for British goods, and raw materials for British factories. Emigration bills were enacted in the 1830s in the British parliament and several government colonial emigration commissions were set up to deal with the issue from the British side of the Atlantic, and even provided government funding for emigrants up until the 1880s.

When the British government stopped its financial assistance to the emigrants, several philanthropists and private agencies such as the Salvation Army, British Women's Emigration Association, and the British Dominion Emigration Society, as well as church groups stepped in to

continue the work. The main objectives of this movement were to alleviate poor living conditions of Britons by giving them a chance for a better life in Canada and to "help maintain the British spirit in Western Canada where foreign influences might otherwise tend to overwhelm it" (Plant 1951:50). The British took this mandate to heart, and by the 1890s comprised the majority of the total ethnic population in Western Canada - coming from both Britain and British Canada (Lehr 1977:19). Some block settlements did occur such as Cannington Manor and the Barr Colony outside of Alberta. There were also pockets of related, friendly, or neighbouring (i.e. back in Britain) Britons drawn by word of mouth (e.g. letters home) or the visit of a colonization agent to their village. Mr. Cameron of the CPR, for example, brought several Britons to the Gleichen area (Gleichen United Church Women 1968:107).

On the whole, though, the British settlers were widespread and tended not to settle in block areas (as per Silver 1938:99). It is small wonder that this was the case. The British government viewed Canadian immigration as a British colonial issue. The Canadian government espoused a policy of assimilation - assimilation to an English Canadian society - a policy well accepted by the majority of the British populace of the west, as seen in the following quotation: "Moreover, the aim of Canada always has been and should be to encourage by every possible means, the settlement of the highest practicable proportion of Britishers on her land" (Peterson 1936:53).

The British settlers would not have had cultural insecurity about their place in Alberta, therefore. In fact, any place in Alberta

was considered a British place, and could be settled as such. The hardships of settlement were things to be fought in Western Canada, and friendly neighbours were helpful in such circumstances. Since British immigrants felt they belonged in this new land that was British, neighbours of other ethnic groups were "foreign", but if friendly and helpful would have posed no threat to the British sense of belonging, if not control in Western Canada. In fact,

Many eastern Canadians and Britishers coming to the Canadian West viewed the area as a colonial extension of the societies they had left...They were the founders of the major social, political, educational, and religious institutions in the province during the pre-World War I era, and they felt they had a right to determine the rules other newcomers would have to follow if the others were to be accepted and accorded full social, economic, and political equalities (Palmer 1982:13).

Foreign neighbours were no threat; they were merely foreigners in British territory - a situation eventually remedied when the foreigners naturalized and became British subjects to obtain their patents.

French-Canadian

French-Canadian colonization of the west began with similar motivations as had the British colonization efforts. Rather than governmental sponsorship, in this instance, it was the Roman Catholic church which was the prime force behind the move west. That is, the infra-structure of French-Canadian western colonization was composed

of Catholic clergy, especially the prêtres colonisateurs (priests who acted as colonizing agents for both the church and the Canadian government). This proved to be a moot point, however, since the colonization of the west by eastern Francophones was opposed by the church hierarchy in Québec. French-Canadian settlers were caught in the crossfire of this dispute, and often went to the U.S. as a result.

To examine this situation more fully, the French presence in the west should be mentioned. To do this conjures up the ghosts of Riel and the Métis people, fur traders, and Catholic missionaries.

Not long after the fur trade opened up the west to Europeans, the missionaries - the Oblate order, in particular, arrived to establish their presence. One of the most noted of these missionaries was Père Albert Lacombe. He and the others tended the spiritual needs of the dispersed French and Métis presence in Alberta but wished to establish the presence and the church more firmly in the west. They, therefore, looked for a place where there was a semi-permanent settlement in existence. In 1860, Lacombe, therefore, established the town of St. Albert (just north of the present Edmonton) in an area which was frequented by the Métis. A church and a priests' residence were built, followed by a convent and an orphanage (Dawson 1936:341).

Lacombe was frustrated in his efforts to create a permanent settlement, though, because the Métis lifestyle still included the nomadic pursuit of the buffalo which led to the neglect of farms. The situation was compounded by a smallpox epidemic in 1869 which depleted the numbers further. It was a farming community in the French-Canadian tradition which was the desired goal. Lacombe even had the land in

St. Albert surveyed in river lot strips (as along the St. Lawrence) to this end by 1861 (see Moodie 1965:68). Having established Alberta as French-Canadian, Catholic territory there was a desire to maintain it as such; hence, a need for permanent settlers. Lacombe, therefore, sought these from Québec, the Maritimes, France, and the U.S. Several did, in fact, immigrate, although the numbers are not discernible since the settlers would have been registered only as British subjects (if immigrating from another part of Canada) or Americans (if from the U.S.) when a census was finally taken. Lacombe's efforts drew the attention of Bishop Taché of Québec, who did not see the situation in the same light as the western priests. Rather than a strengthening of the Francophone, Catholic presence in Canada (i.e. the west) Taché saw a weakening of the Francophone voting power in Québec, through the depopulation emigration would cause. He, therefore, published an article "La Vérité" which painted western migration as fraught with hardships; ending primarily in discouragement, and certainly in assimilation by the Protestant settlers. Settlement in northern Québec-or at the most Manitoba was offered as an alternative (see Berube 1908:1). The Riel altercations in Manitoba in 1875 only served to underscore Taché's arguments.

Lacombe, in an effort to counteract this, established his own colonizing company in Montréal in 1875, which distributed information and arranged settlements via his own network of prêtres colonisateurs. Some settlers were attracted, but many Québécois still preferred to migrate to the U.S. to improve their lot, rather than to northern Québec or the west. Lacombe, therefore, went himself, and with other

priests, to the American settlers. For each of the settlers he persuaded to go west, he had arranged with the Canadian government to receive a fee of \$17.00, since these people were classed as foreigners (Americans) immigrating to Canada and subject to the fee paid other foreign colonization agents. Church consent may finally be assumed at this point since Bishop Taché was noted to have been in receipt of the funds (Silver 1966:45).

The late 1870s saw an increase in the number of Francophone settlers moving west. Letters sent home to their families and friends by farmers also drew settlers, but independently of the church. Such was the case in the Pincher Creek area with such families as the Beauvais, Cyrs, and Theriaults arriving from the U.S. and the east. The church, nonetheless, sought to maintain its influence in these pockets of independent settlement. In 1885, a permanent Catholic church was built in Pincher Creek (Old-Timers Association for the Album 1958:8). Thus it was included in a list of predominantly French-Canadian communities set up in Alberta (e.g. Legal, Morinville, Beauchamp, Rivière Qui Barre, St. Albert) well before the arrival of other settlers. Nonetheless, French-Canadian settlement was not large (see again Table 1).

The early words of Bishop Taché cast a pall over the westward venture. Parishioners in Quebec were constantly being asked for aid to be sent to the settlements in the west, which did little to instill their confidence in the area. The final blow seems to have been struck by the culmination of the second Riel uprising. Western Canada became viewed as an area hostile to French-Canadian rights, despite the promises to the contrary made by the Laurier government in the 1890s.

Western Catholic clergy began a concerted effort to balance this fear and bring in yet more French-Canadian, Catholic settlers to balance the rising numbers of foreigners and Protestants arriving in Alberta. There was no question to the clergy that the west was Canadien territory, and Catholic, and should remain so, as seen in the following quotations taken from letters of western priests to parishioners in Québec:

ne voyez-vous pas combien un député canadien-français venant de l'Ouest sera bien placé pour défendre les intérêts progrès de la province de Québec? (Bérubé 1908:5).

...et éclairé plus canadiens que tous les autres, exercent une influence décisive sur les Métis, Galiciens, Hongrois, et autres de vieilles races européennes (ibid.).

The attitude thus expressed harkens to the British position which saw the west as a colonial extension of its territory, and settlers there to be assimilated to its culture. However, because of the rising number of foreign, and especially British, settlers in the west of the 1890s, the French-Canadien position was tenuous. Bishop Morin compiled two brochures (at government expense) urging French-Canadiens to settle in the west, i.e. Le Nord-Ouest Canadien et son ressources agricoles (1894), and La terre promise aux Canadiens - Français: Le Nord-Ouest Canadien (1897). The first was a collection of advice and letters from happy, successful, western Francophone farmers aimed at Québécois in Québec. The second was aimed at Québécois who had migrated to the U.S. Their effect was minimal. By the end of the nineteenth century, in fact, there was so little western settlement

by French-Canadians that the CPR stopped advertising in French as early as 1883, according to Silver (1966:133). Those French-Canadians who had arrived in Alberta by this point were isolated by their own choosing into two main groups: 1) those who had immigrated independently, and set up independent, French-Canadian communities with their own resulting independent and Francophone character, 2) those who had been brought west by church agents to act specifically as a French-Canadian, Catholic presence and who maintained that presence accordingly.

When French-Canadian immigration all but ceased and other groups' numbers swelled, the French-Canadians were further isolated, since they became surrounded by other groups. Some moved away - either further into unsettled Alberta, e.g. St. Paul, or returned to Quebec. World War I saw the return of more French-Canadians to Quebec. The most dramatic isolating factor, though, was the change in the Catholic church hierarchy in Edmonton from French speaking to English speaking bishops (see Stocco 1973:8). Seemingly abandoned by the Francophone communities of the east, the Canadian (assimilationist) government, and finally the very church which had brought them to Alberta, the French-Canadian settlers were faced with two choices: to "dig in their heels", i.e. to remain French-Canadian, or to be assimilated. Both options were followed in varying degrees, but French-Canadian influence was greatly reduced in Alberta from its peak in the 1860s and 1870s.

Germanic Peoples

Germany (or rather the collection of German-speaking states and territories which now make up Germany and some other countries at the

end of the nineteenth century) presented a good example of the general European conditions of poverty, overcrowding, and unemployment mentioned earlier in this chapter. The Napoleonic, then the Franco-Prussian wars had drained financial and agricultural resources, and overpopulation had forced many farmers off the land. The empress of Russia - Alexandra, herself a German, had attempted to alleviate this situation and increase Russian prosperity by opening up colonies in Russia where Germans could farm free land. Russian politics, at this time no more stable than German ones, thus left many of these colonists still seeking a better life along with the compatriots they had left in Germany.

Emigration to less volatile, and more prosperous, regions (i.e. North America) provided a solution to those individuals engaged in such a search. German emigration was not a mass movement, or even government or agency (e.g. church) sponsored, as was the case for the British and French-Canadian settlers. This is not to say that assistance was not given to emigrants/immigrants by religious groups or government agencies. Indeed it was, but this was not on the scale, or with the same motivation as with those groups previously mentioned, i.e. "The majority of [German] migrants travelled on their own responsibility" (Dawson 1936:276). They travelled in such numbers as to become the largest national (read ethnic) group migrating from Europe (Huebner 1962:83). However, the place the majority of them migrated to was the United States.

German immigrants were favoured by the Canadian government, though, for their reputation for hard work, affability, and on the

assumption that they were assimilable, if not a "related" nationality in terms of cultural and racial similarity (see Lehr 1977:26). Also, as Gibbon points out, there was an emotional attachment to German peoples since the British Royal Family itself was really German in origin (1938:27). For these reasons, the Canadian colonization agents sought out German immigrants. Canadian agents were not all well received in Germany by the German governments which looked with disfavour upon the depopulation of their states, even of the poor - but especially of the industrious farmers sought by Canada (see Longman in GIA 1887:6). Canadian efforts were, therefore, also directed at the German population which had recently migrated to the U.S.A. Of the 2,251 German immigrants to Alberta in 1901, 435 of these came from the U.S. (Silver 1938:128). The large number of Germans immigrating directly to Canada from Europe was aided by a tightening of U.S. immigration laws beginning in the 1890s, which curtailed the U.S. as a destination for many Germans.

As previously noted, German immigration was of an individual nature. This was not to say that German immigrants did not settle in groups or in areas near to each other. Letters back to Germany, or even to German relatives or friends in Ontario, would have brought these people to the areas inhabited by kith and kin. Those settlers solicited from the U.S. had a particular penchant for block settlements and tended to migrate in groups to Canada. Between 1891 and 1894 there were no less than 14 German settlements established in the country subsidiary to the railway (Silver 1938:98).

Some of these settlements were organized for a particular philosophical purpose, such as the German Catholic settlement of St. Peters in Saskatchewan. However, most German blocks served to demonstrate a collective example of the individual settlement pattern noted before. That is, the groups organized to stay together as friends who had known and worked with each other in the U.S. and shared a common heritage. They felt comfortable together and could continue to help each other in Canada. Such sentiments were certainly noted for the areas of major German settlement around Wetaskiwin, and Leduc, Alberta (Bicha 1968:102). Pockets of German settlers attracted other German settlers (from the U.S. and Europe) and grew, but on the whole there was not a concerted effort to establish a German presence in the west that could be compared to the British and French-Canadian colonization efforts. German culture was maintained to a large degree. Churches - both Protestant (primarily Lutheran) and Catholic were set up with the German language for services. Sports, political, and social clubs were formed from Edmonton to Medicine Hat, e.g. the Association of German Speaking Workers, Turn und Sport Club Jahn, Verein Alpenrose (Gerwin 1938:143). However, the assimilation process was noted to be accomplished by the third generation in most cases (Dawson 1936:330). A number of factors account for this: a) inter-marriage between ethnic groups may have lessened or changed ethnic ties, b) the need to communicate with other ethnic neighbours would necessitate a lingua franca - in this case English, c) "b" would be a factor in changing church services to English - to meet the needs of both German and Swedish Lutherans, for example, d) the desire of

the Canadian government to assimilate immigrants and their use of classroom education of children to do so, e) the apparent willingness of the Germans - while keeping their heritage in private groups - to be publically assimilated. Germans remained favoured and assimilable immigrants until the First World War, at which time German immigration was restricted. By the time immigration resumed, the scope of this study had been passed.

Scandinavians

Scandinavian emigration to Alberta followed a much similar pattern as German emigration. Likewise, Scandinavia is a term used here to cover what are now the two separate states of Sweden and Norway (Denmark is not included in this instance). Until 1905, Norway was under the government control of Sweden.

Scandinavians were as sought after as Germans, for the same reasons (CPR 1926). Even the emotional ties existed between British and Scandinavians. Gibbon again notes this by saying that Queen Alexandra of England was, in fact, a Dane (1938:27).

Economic conditions were difficult enough in Sweden and Norway to induce the landless and poor to emigrate at the end of the nineteenth century. Crop failures had heightened the situation.

As with German emigration, though, Canadian colonizing agents (both governmental and private, e.g. CPR) faced two major problems while obtaining settlers from Sweden. Firstly, the Swedish government was even more opposed to emigration than the German governments. In their view, depopulation depleted the labour market, forcing wages to rise. Failed, pauperized Swedes then returned to Sweden to exploit

the situation. Agents such as Andrew Schmidt in Sweden were instructed to work quietly (Longman 1887:5, 6). The second major problem faced was that the majority of Swedes - 86%, in fact, chose the U.S. as their destination (Nelson 1943:37). Since the problems were the same as for German settlers, so were the solutions. Agents such as C.O. Swanson of Wetaskiwin were dispatched to U.S. settlement of Swedes. Their task was made easier by a series of crop failures in the U.S. in the 1890s, and by the disgruntlement of the single farmhands of Minnesota and Dakota who had emigrated in search of a better life but found low wages. Canadian recruiters met with a similar rate of success for Swedes as for Germans, such that in 1901, 919 of the 1,491 Scandinavians to enter Alberta came from the U.S. (Silver 1938:128). By 1902, C.O. Swanson noted that the U.S. campaign had gone so well that he could diminish advertising there since letters from the settlers to friends and relations were noted to be acting in the same capacity (Bjork N.D.: 15).

Block settlements of Swedes in Alberta were as common as those of Germans and for similar reasons. They included settlements (no less than six between 1892 and 1896 alone) in the areas of Calmar, Malmo, Wetaskiwin, New Sweden, New Norway (Silver 1938:98). It has been suggested that central-northern Alberta was favoured by Swedes and Germans because of the presence of trees which made the area resemble the lands they had left (Nelson 1943:353). That C.O. Swanson himself came from Wetaskiwin and brought two of the settlements there may have been another reason.

The Swedes and Norwegians who did migrate to Alberta maintained their culture through clubs and groups, chief among which were church groups. The United Norwegian Lutheran Church in Canada presents an example of this, as do the numerous Lutheran settlement groups such as the Swedish Lutheran Immigration Aid Society formed to aid the influx of settlers. Despite these attempts to strengthen and maintain cultural ties, the Swedes and Norwegians gained a reputation for being among the most assimilable ethnic groups in Alberta, even among those of their own number, as demonstrated by the following excerpt from a Swedish minister:

I foresee that our church will, in the course of time, turn over to English. As long as the old folks are with us, and for the sake of serving newcomers from Sweden, the Swedish language must be used (Benegtson 1927).

Several reasons have been offered for this situation, and they parallel those offered for German assimilation: 1) intermarriage with non-Swedes was common since many more single male than female Swedes immigrated; 2) children were educated in English and became Canadian in one generation; 3) English became the medium for communication among neighbours of different ethnic backgrounds and even Swedes or Norwegians who spoke different dialects; 4) Scandinavians divided themselves into several splinter groups, especially by religious affiliation (there were four Norwegian Lutheran synods represented alone in Alberta). As a result, they were too divided to present a unified resistance to assimilation (see Nelson 1943:374; Bjork N.D.:25; Janssen 1979:6). One more factor has been named in connection to this

ease of assimilation for Swedes. It is one of attitude, termed "a less distinct sense of ethnic awareness" (Janssen 1979:5), and "Swedish envy" (Nelson 1943:374). The premise of these observations is that Swedes were not given to grouping together and demanding rights, or speaking out, and were quite content to become Canadian citizens and build their new lives in their new country.

World War I brought a diminution of most immigration, and Scandinavians were no exception to this trend, although they were not removed from "preferred" status as in the case of the Germans.

Ukrainians

Ukrainian immigration differed from that of the other groups mentioned. Again, government, individual, church, and railway interests acted to bring Ukrainian emigrants to Canada despite opposition from the (Austro-Hungarian) authorities in the Ukraine. However, the Ukrainians themselves were so successful at recruiting their fellows to emigrate as to pose difficulties for the Canadian government. Government actions were met with Ukrainian reactions, and difficulties in public relations were established which lasted generations.

In 1895, Ivan Pylypiw returned to his native Ukraine after an initial visit to Canada. Although the officials of the government of the Ukraine tried to detain him, he nonetheless returned to Alberta later that year to establish a settlement with some landless compatriots, at Edna (renamed Star), Alberta. Thus began the influx of Ukrainians to Alberta, 97% of whom came from the Ukrainian provinces of Galicia (or Halychyna) and Bukovyna (Multiculturalism Directorate Department

of the Secretary of State 1979:223). Immigrants continued to arrive in the Star-Wostok area (NE of present Edmonton), drawn by reports from earlier settlers. Added to their voice was that of Dr. Joseph Oleskiw, who had come from the Ukraine to survey the settlement area, and reported back to University and government groups in the Ukraine, as well as to prospective emigrants. His views and subsequent activities were successful enough that the Canadian government paid him as a colonizing agent. Oleskiw's own brother - Volodymir, led one group of emigrants to the Wostok area in 1896 (UPAA 1975:20). Yet another group followed, led by a Peter Svarich in 1900 (op. cit:19).

Although not all Ukrainian settlers were found there, there was a decided and demonstrated preference exhibited for settling in a block or area lying roughly between Bruderheim and Vegreville. This posed a dilemma for the Canadian governments - federal and provincial. The preference shown for the parkland area of Alberta has been given several contradictory explanations: 1) The area reminded the Ukrainians of their homeland, 2) The area was known for its fertility, although Schlichtmann reports it had poor soil (1977:13), 3) It provided trees which could be used at will in comparison to the luxury they had been in the Ukraine, 4) Government personnel wished to segregate them there - away from most other immigrants, for various reasons to be discussed (Bicha 1968:89; Bilash Pers. Comm. 1982; Lehr 1977:28).

Whatever the reason, the Canadian government found that there was indeed a large group of Ukrainians in Alberta, in one area, and the group was growing larger. Conservative government policy prior to

1896 had at times favoured block settlements in the west. Blocks were seen as a good psychological factor in insuring settlement success. Immigrants would help each other, provide a sense of belonging, and prevent footlooseness if they were all of the same origin. In a less altruistic view, blocks provided a means to isolate from the rest of the populace immigrants who were thought to be "dirty, poor, sickly, rebellious, and immoral" (Lehr 1977:29). It also proved advantageous to federal and provincial officials to administer settlement aid, government services, and assimilation efforts to groups which did settle in close proximity. These advantages, plus the near impossibility of stemming the block preference of the immigrants confronted the Laurier government after 1896. The realities of the situation were grudgingly recognized, although such blocks made Liberal assimilationist policy difficult to administer. The solutions were to assign settlers without a destination to a place and thus disperse settlement, and to use established blocks as bases for assimilation such as through education (Lehr 1977:44, 47).

Apart from a need for land, a desire for political freedom had motivated many Ukrainians to emigrate. Many immigrated to Canada, therefore, regarded with suspicion, if not anger, government efforts to Anglicize them. They withheld taxes and set up their own schools (Lehr 1977:48; UPAA 1970:37). Lessons in Ukrainian language were offered after regular classes and were not incorporated into the curriculum until 1959 (Lehr 1977:47).

A perceived persecution by government officials was paralleled in the area of religion. As noted in the discussion of French-Canadian

settlement, the Roman Catholic church sought to include Galician immigrants in its sphere of influence. Catholic clergy were, therefore, sent out to the Ukrainian settlements from the French-Canadian areas. The Ukrainians preferred their own Uniate rites. However, a delegation, instigated by French-Canadian interests persuaded the pope to set out a bull forbidding the practice of Uniate or Orthodox rites in the Roman Catholic church. A Ukrainian delegation to the pope arranged for the rescinding of the bull, but ill will towards Catholic clergy was firmly established. The Edna settlers advertised for and obtained an Orthodox clergyman from the U.S. in 1897, and built the first Ukrainian Catholic church in 1899 (UPAA 1970:16, 17).

Ukrainian-Canadian newspapers, political, and social groups were formed in much the same manner as other ethnic papers and groups, to maintain cultural heritage. Although tensions and prejudices (on both sides) eased so that Ukrainian settlers were in demand as hard workers by 1926, the assimilation of Ukrainians was met with stiffer resistance than that of Swedes or Germans (CPR 1926).

Settlement Expectations and Attitudes

Several motivating factors have been examined in regard to the wave of immigration which swept Alberta at the turn of the century. Chief among these was the desire of the immigrant to seek to better his or her life in Canada. Whether he/she had been leaving for reasons of poverty, disinheritance, unemployment, or varying degrees of dissatisfaction with his/her old life, there was the need for a compulsion to change before a person would actually cross several thousand miles (or kilometers), and face uncertainty in a new land.

Motivation was met by a host of facilitating factors which opened the floodgates to immigration. These factors included - solicitation by the Canadian government, its agents, and railway or steamship company agents; special fares to lower travelling costs; the Dominion Lands Act which made it possible to own a farm for \$10.00; a tightening of U.S. immigration laws; difficult economic times and a shortage of free land in the U.S.; the development of Red Fife and Marquis wheat, coupled with the economic upturn for Canadian wheat farmers; and the opening of the west to settlement by the railways.

Because of its motivations to emigrate, each ethnic group studied brought with it certain attitudes which influenced its maintenance of cultural heritage/assimilability.

The British viewed Alberta as (British) Canadian territory and arrived in enough numbers to maintain this claim. Areas of group settlement did exist, but British settlers tended to disperse throughout "their" territory.

Similar traits were exhibited by French-Canadians with the exception of a penchant for settlement in groups. They sought to maintain French-Canadian rights in the west (and in Québec) through immigration. Their numbers were insufficient to accomplish this, and they became isolated in pockets or were assimilated. Settlements had occurred in specific areas in order to remain close to friends and family while facing hardship, and under the guidance of the Roman Catholic church.

Germans and Scandinavians both were foreigners in Canada, but desired foreigners. They moved to Canada to better themselves, often settling in block areas. But, due to internal divisions, external

pressure (intermarriage, education of children), or a disinclination to do otherwise (although maintaining private heritage affiliations), a majority were assimilated into the mainstream of Anglo-Canadian society by the third generation.

Ukrainian immigrants were kept isolated from other groups in block settlements both by government design and their own choice. Efforts to assimilate them either by the government or the Roman Catholic church were met with distrust and mixed success. They did become good citizens of Alberta but citizens mindful of their cultural heritage.

Thus, each ethnic group studied brought with it to Canada its own expectations about Canadian life, and its own attitudes about the place of its cultural heritage within that life. Such attitudes would influence the display of culturally related attributes including those associated with architecture. The next chapter will examine the architectural heritage of each immigrating group, as an aspect of ethnic culture, and a concrete reflection of the pressures to assimilate affecting the immigrants themselves.

CHAPTER III

ARCHITECTURAL BACKGROUND

Just as immigrant groups to Alberta held viewpoints about their cultural heritages which varied, so the cultural heritages themselves varied. This study dealt, in particular, with the architectural aspects of those heritages. In order to more fully understand the manifestations of ethnic vernacular architecture assumed in Alberta, it is first necessary to understand the traditions from which they sprung for each ethnic group, and the general trends in world and Alberta vernacular architecture which influenced and modified their traditions.

The nineteenth century was a period of rapid change, primarily brought about through industrialization into the area of domestic vernacular architecture. Prior to this period, architectural traditions for dwellings, particularly rural ones, had evolved slowly from mediaeval archetypes.

British Architecture

Within the borders of a country, let alone a kingdom such as England, Scotland, Wales, and Ireland comprised (or any of the European composite states), there were many variations in architectural styles, just as there were many dialects. Regional variations were demonstrable in design of houses, layout of outbuildings, and construction materials used. Bearing this fact in mind, the following will be a synoptic view of the trends evident in dwellings of given peoples just prior to the effects of industrialization.

Small British vernacular dwellings tended to be represented by the cross-passage house, houses with outshuts, and double-pile houses

(as per Brunskill 1971:173-175). In each case, a portion of the one or two storey building was given over to agricultural purposes. A cross-passage house was a variation on the earlier "long house", with farm buildings for animals attached to one side of the house. Outshut buildings used the extended rear of the house to store agricultural produce or stock. Some rooms of the upper storey of a double pile house were used for similar purposes. Cottages remained primarily two-room dwellings of one storey, but were seen to expand into two storeys to accommodate the growth of cottage industry in the seventeenth and eighteenth century.

Where stone predominated the landscape, it was used for building walls and foundations; where not available, timber frame, or cobble construction was used. Weatherboard cladding was known from the sixteenth century but was not common. The same principle applied to the choice of roofing materials (e.g. slate or thatch) namely availability of material - including the cost thereof. Because of brick taxes, brick was less common for ordinary rural dwellings (op. cit:46). Trussed roofs, or roofs using purlins were most common. Frost was of little problem for British architecture. Therefore, stone work could, and often was, dry laid (i.e. no mortar) and plaster could be infrequently applied to frame buildings (Rempel 1980:104). Cellars were not common with such masonry.

It was said that the chief noted feature of British dwellings was symmetry (Dunbar 1966:238). A small cottage might have consisted of two separate rooms - one for living and one for public use. Less humble abodes favoured a central hall and/or stair with equal number of rooms and fireplaces on either side, as in the double pile type house.

Row housing was known and found primarily in cities or built-up areas. It followed the same basic plans mentioned but was composed of attached and repetitive units.

French-Canadian Architecture

French-Canadian vernacular architecture took its roots from the architecture of Normandy and Brittany. In Canada, the earliest transplanted examples (pre-1759) are given the name "French Regime" (Humphreys and Sykes 1974:4). They were characterized by wetlaid stone masonry, a steeply pitched roof (i.e. $\frac{2}{3}$ the height of the building), shingled, and often bell-cast with gable dormers, casement windows, a symmetrical placement of chimneys, and an asymmetrical entrance on the main facade. The interior varied, but was noted to be frequently asymmetrical (see *ibid.*; Lessard and Marquis 1972:265; Moogk 1975:23).

Stone was the prime building medium because it had been in France since the forests were depleted there. Wood was used for internal supports, roofing, walls, and flooring. Work in wood for walls and external structure had to be learned once in Canada because it was a less familiar practice than masonry. It was learned quickly, though, and wood housing was noted to have quickly replaced stone because of its abundance, cheapness, relative ease of use, and higher insulation factor (Moogk 1975:29). Walls were sometimes doubled to increase the insulation factor, and the internal spaces were filled with such materials as wood chips, moss, or stone. The exterior was even noted to have been plastered, on occasion, but the plaster tended to crack with frost (Lessard and Marquis 1972:269).

Pièce sur pièce or poteaux et pièce coulissante were the names given to the most common wood building method developed. (The method came to be known as Red River Frame construction when it migrated west). It consisted of hewn horizontal logs, resting on log sills slotted into corner timbers. At times, a similarly constructed barn was attached to the side of the house by a wooden passage. This was termed the "Québec connected barn", or "maison bloc" (see Wonders and Rasmussen 1980:214). A three-sided courtyard or "maison cour" was also a common layout of farms, with the house forming one side, such that its main door faced away from the prevailing wind as per observations of Lessard and Marquis (1972:269) and Burley (1980:11).

Stone housing returned to popularity in cities because of its fireproof nature. In rural settings, though, wood construction remained common for its cheapness and its resistance to cold (in comparison to stone).

Germanic and Scandinavian Architecture

Northern central Europe - including what is now Germany, and the Scandinavian countries - exhibited regional variations of a similar vernacular building tradition. Two forms of building are noted to have been predominant, namely: half-timbered or post on beam frame construction, and horizontal log construction (Phleps 1982: Makoto 1978:10). Because of the weight of these building materials, houses tended to be short and heavy, or had no more than a loft. A purlin construction, shingled roof best suited the stresses in log buildings. Private and public house space was separated on room by room basis. A public living room was usually central in the house and flanked by private rooms for

sleeping, and an entrance hallway. Norwegians have been noted for most commonly using a three-room plan in the above arrangement, i.e. living area central and sleeping quarters flanking it (Makoto 1978: 16, 178). When an upper storey (i.e. a loft) was present, it was the private area, and public entertainment was relegated to the lower floor. Stone porches were also a common feature and were used for public functions when entrance to the house was restricted to private purposes, according to Makoto (op. cit:13). The entrance itself was primarily on the gable facade of the building (since gable roofs predominated), though were also less commonly found on the lateral facades. In either instance, it faced onto the courtyard created by the surrounding outbuildings.

Double hung windows were slightly more predominant than casement windows, for use in log or timber frame buildings because of their observed superior resistance to weather (Rempel 1980:59).

Actual building techniques varied as much from builder to builder as region to region. Round or hewn logs were both used, and the location of the stone fireplace varied within the living/dining area. However, Scandinavian log architecture demonstrated the use of rounded logs most often, which were generally saddle notched and overlapped on the corners. Germanic log construction, by comparison, showed a preference for flush - i.e. dovetailed, or dovied corners which left spaces between the logs of the wall and required wood, in addition to earthen chinking materials. Basic timber frame construction gained a cultural uniformity throughout Europe by the eighteenth century, although the usual individual variations in construction detail and ornamentation were observed (op. cit:103).

Urban architecture was a different matter, although timber frame was frequently employed for that type of construction.

Ukrainian Architecture

Ukrainian rural vernacular architecture was yet one more European architectural form which had divergent manifestations by geographic region. Even within regions - specifically those of Bukovyna and Galicia, discussed in this study - this was so. Nonetheless, two types of house construction were used prevalently. Less prevalent was the use of log construction for the whole house. Timber was often scarce or forbidden to the use of serfs. When it was used, the pièce-sur-pièce method of construction was common. It should be noted that this was an indigenous use of the method, and although the French-Canadian term is used here, there was no connection between the two groups for diffusion of the practice (Lehr 1980:188). Saddle notching was also used. The more prevalent type of construction was a form of wattle and daub, using upright logs (large for main posts and smaller in the intervals) interwoven with strips of a straw, clay, and horse manure mixture (as per Swystun in Woodsworth 1917:95). Walls thus constructed were plastered and whitewashed. The features most common to this kind of house were: "a southward orientation, a single storey, a rectangular two or three room plan, a central chimney, a gable hipped roof or hipped roof, and use of distinctive colours in decorative trim" (Lehr 1980:184). Added to these were a clay or wooden floor, fixed or casement windows, a thatched or shingled roof on a ridgepole construction running east to west (Swystun in Woodsworth 1917:96).

The southward orientation, high pitched/overhanging roof (often supported as a porch), and colour scheme of the building exterior were common.

Around the house, the outbuildings were frequently organized in a courtyard arrangement, "making the establishment look like a small village" (Swystun in Woodsworth 1917:98).

Change, and Nineteenth Century Architecture

Wood was, therefore, the most common building material in pre-nineteenth century in central European vernacular architecture and was augmented by plaster in the Ukraine. Stone predominated in western Europe, and England because of diminished wood supplies. Stone architecture was transferred to New France but was augmented and/or replaced by wood architecture in view of the abundant stands of timber. Building materials were those found locally and used by local peoples to create vernacular architecture which reflected local norms in house plan and suitability to the environment. In effect, a local model or house pattern is set, "as true for the Danish farmer as for the French or Yugoslav peasant" (Rapoport 1969:4).

The increased development of industrialization throughout nineteenth century Europe had changed the above-mentioned emphasis upon solely local traditions. Industrialization is credited with bringing different, mass-produced building materials and the new means of transportation (railway, steamship) to ship these materials to widespread markets (Petzsch 1971:106).

A corollary to the introduction of new materials created by industrialization was the fact that industrialization helped create the need for mass produced and easily/quickly assembled building materials. (i.e. "new materials" here refers primarily to means of production. Many materials, e.g. brick, iron nails, weatherboard had been used for

centuries, but it was the fact that mass production made these materials available in quantity to those who had not used them to any extent before, which was new.)

Factories required large numbers of workers who swelled the cities. The workers required housing, and new materials provided this. Where rural vernacular architecture existed, it remained, particularly in the less industrially developed areas. But the vernacular dwellings of the nineteenth and early twentieth centuries incorporated the plethora of new methods and materials into the earlier building traditions. Brick, in particular, gained wider use, especially in England. In conjunction with the increment of brick production came the improvement of lime mortar and the introduction of portland cement.

Wood was also mass processed for building materials where it was available. Examples of clapboard and weatherboard had been noted in England dating to the sixteenth century (Brunskill 1971:62).

Rapid processing of lumber made weatherboard a more common building material. It was well suited to quick assembly and required less degree of building skills than stone masonry or brick laying. As such, it was ideally suited for the farmer, vernacular architect, or the unskilled masses who required housing and employment building the houses. Mass production of machine cut, then wire cut nails, aided the implementation of weatherboard frame architecture, in the same way that lime mortar had increased the use of brick. This trend in wooden architecture was especially true in the Scandinavian countries, where wood was more plentiful. In Norway, for example, "simple box-like houses with weatherboard cladding became normal" (Makoto 1978:19).

Similar uses of clapboard or weatherboard construction were made in even more remote and rural areas during the nineteenth century. Finish vernacular architects in northern Scandinavia, and even Russian farm or village architects employed these "new" materials and methods (as per Richards 1966:57; Kerblay 1978:18). In the Ukraine, these techniques of wooden house building was known and used by some of the wealthier peasants according to Swystun (in Woodsworth 1917:95). However, wood still remained inaccessible to the majority of peasants due to lack of timber timber rights belonging to the upper classes or lack of finances. The Ukraine was also less affected by sweeping changes such as industrialization and urbanization in comparison to the rest of Europe. Where this technological lag existed, so did an ideological lag. That is, folk ways persisted longer in areas less dramatically impacted by technological innovations.

Those areas throughout Europe which were party to the new industry and technology exhibited no (or minimal) such lag in the exchange of ideas. New, faster modes of transport delivered not only building materials but ideas about building. The result was not, as might be anticipated, a uniformity of building styles throughout Europe - at least at this point. Instead, the rapid exchange of a variety of architectural concepts led to a smorgasbord of styles and influences, one rapidly superceding the other in popularity, mixing with indigenous traditions, and converging at the end of the nineteenth century in buildings which were eclectic in style and construction methods.

This sharing of ideas was particularly true at the level of professionally designed architecture as noted in the following quotation:

The English seemed to have looked to France in the 1850s when Napoleon III promoted his "Second Empire" mode. The Neo-Goths in the 1830s read the treatises of the German and French Catholic revivalists just as the pre-Raphaelites looked to the Nazarenes...Pugin's books were avidly read by Rhenish, Dutch, Belgian, and even French gothicists. The Englishmen admired Viollet le Duc (Dixon and Muthesius 1978:28).

The advent of this era in which ideas and materials proliferated and were traded, also affected vernacular architecture, bringing it to Brunskill's "polite" threshold (see Chapter 1). Other factors besides industrialization and urbanization served to carry vernacular architects across the threshold. Government policies and social awareness were among the factors indirectly affecting building styles. Government and privately funded public education increased in the nineteenth century, and with the rise in literacy came reading materials for public consumption which included pattern books of house plans and designs.

Architectural concepts were further standardized because of government and private concerns for public health. In Britain, for example, various health acts were passed which governed housing conditions (particularly, but not exclusively, in cities) as illustrated by the "Housing for the Working Class Act of 1890" (Curl 1973:109). A general public concern for hygiene, both at home and in the workplace, grew slowly. Views in this connection circulated throughout countries in the pattern books, magazines, and journals, and gave instructions in such details of building construction as number and placement of

windows needed to adequately ventilate a house and avoid the accumulation of "night air" (Carter 1979:73).

A variety of factors worked in conjunction during the nineteenth century in Europe to turn vernacular architecture there, away from its mediaeval traditions. This is not to say that vernacular traditions died out. They did not, especially in the rural areas, and those areas circumvented by industrialization. However, the availability of a variety of ideas and materials for building had an impact upon construction and renovation during the period, and increased the number of choices available to the builder. Paradoxically, choices were also limited by government dictum and prevailing public taste. These factors served to make the vernacular architecture of the nineteenth century more standardized throughout Europe than it had been (if not completely uniform), and to produce different stylistic and constructional emphases than the mediaevally based architectural heritage which had preceded them.

North American Nineteenth Century Architecture

European immigrants to the new world brought with them elements of the cultural heritage to which they belonged. Vernacular architecture has been noted among these elements (Lewis 1970:33; Glassie 1975:119). The very fact that these elements were transferred to a new environment - both physically and socially are noted to have instigated several changes in the original designs (Dick and Lebeuf 1980:2). Or, as Rempel put it for the situation in Ontario,

By the time Upper Canada was founded, a modified [building] technology had become solidly established. It was a strong technology because it found the answers to existing problems.

It was the social response to the New World, and was thus

a characteristic phenomenon of the time, expressing the nature of a people now unhampered by tradition, and capable of an uninhibited approach to new difficulties (1980:5).

Survival was the prime requisite for the new environment. It dictated the hasty construction of a dwelling as a means of shelter from the harsh climate as the first "social response to the new world." These rapidly assembled houses were made of the materials at hand, and "were generally rude frame, log or soil" (Dick and Lebeuf 1980:1). The emphasis placed upon haste of construction, use of readily available materials and temporary nature of the dwelling (i.e. used until a better one could be built) determined that these early dwellings were very like one another, and exhibited few distinguishing characteristics. They provided shelter from the elements. Rapoport notes that pre-industrial (i.e. survival based) societies will not exhibit characteristics vernacular architecture to a degree comparable with "industrialized" or trading societies (1969:14). The first year in a hostile new world, prior to the construction of transportation routes (rail, roadways) qualifies here as a pre-industrial society. When an immigrant was ready to build a permanent dwelling, the building technology mentioned by Rempel would have been employed. Permanent dwellings are those which form the basis of this study, and are defined by Schoenauer:

The permanent character of the dwelling and occupational specialization ensure better workmanship and detailing. Doors, windows, roofs, floors, and chimneys have an advanced performance standard. Interior climate control is no longer designed to the criterion of survival but to that of comfort...

it's usually a multi-room building, and the various rooms are designated for special functions; single purpose rooms such as bedrooms, parlour and kitchen, and multi-purpose rooms such as family rooms are both encountered in various degrees (1973:106).

The permanent dwellings, whether built while living in a temporary shelter, or upon arrival in an unisolated and "industrial" territory did, at times, demonstrate the building traditions of the immigrant for whom they were built, according to several sources (Rempel 1980:28; Russell in Schulyer 1978:9; Dick and Lebeuf 1980:2; Lewis 1970:33).

Because of the new environment, i.e. new climatic factors to be considered; new neighbours with different tastes, building traditions modified, and influenced one another. The "new forms" thus established were considered typical of America, and became America's vernacular architecture. Two illustrations of this principle may be found in the "American log cabin" and the "New England frame house". Swedish settlers have been credited with the introduction of the log cabin to North America (Rempel 1980:28). German settlers also brought a log construction with them (op. cit:29). From these two sources, the horizontal log cabin spread throughout America. Both types (Swedish and German) of construction were common.

Germans flush corner construction with dovetailed joints was noted for superior water drainage from the joints (op. cit:14). The Swedish type of dwelling required less skill to construct.

Frame and clapboard construction was also not developed in America but came from England where it was a known, if infrequently used building

method. In America, however, two factors in particular allowed for the increased use of this type of construction. The first was the availability of wood from the North American forests. When industrialization, and the mass processing of lumber developed in the early nineteenth century, the second factor emerged. This was the development of the balloon frame, after which frame and weatherboard construction became common, not only in New England. A balloon frame, thought to have been created in the 1830s in Chicago, was a lightweight wooden building frame of upright studs and cross pieces (as per Rempel 1980:122; Giedon in Mumford 1952:202). It made possible rapid construction of wooden houses, because the frame was more manageable than timber frames; was produced in quantity (and cheaply), along with the weatherboard to cover it, and nails to assemble it; required relatively unskilled labour to utilize it, i.e. "a man with a hammer" (Giedon in Mumford 1952:202).

Wood was, of course, not the only building material in North America, but because of its abundance, was used commonly. Where available, and especially after the introduction of industrial processes, such as brick and lime making and mass quarrying, other building materials were used.

By the late nineteenth century (the scope of this study), American vernacular architectural traditions had firmly established themselves such that they were considered to be "American", having lost their connection to the heritages from which they came, if not the actual forms. The European styles were incorporated into these forms, but the character of the resultant hybrid building was American. These were the traditions which immigrants to the American and Canadian west

encountered during their westward travels. What were these traditions? In northern North America (Canada, and the northern U.S.), it is said that by the nineteenth century these traditions came primarily from Britain (Lewis 1970:33). Even in French Canada, the nineteenth century dwelling styles which were introduced there were acknowledged to have come from France to England, then via the United States (Lessard and Marquis 1972:382). The Second Empire or Mansard-style houses are those, in particular, to which this route of diffusion applied.

Nineteenth century Canadian building traditions (e.g. Maritime, Ontario frontier) demonstrated regional differences. However, the British influence was nonetheless present. It should be remembered that British vernacular "polite" dwellings of the nineteenth century were themselves an eclectic amalgam of various European stylistic influences. Hence the Italianate, or second empire styles were considered British because they came to North America from Britain, despite their continental origins. Various British-origin styles of architecture have been noted in existence in nineteenth century Canada and have been chronologically arranged below. (Note: the Parks Canada classification is used here to be consistent with the CIHB recording system which was used for this study.)

pre 1820	Georgian	1850 - 1870	Picturesque
1810 - 1830	Neo-classic	1860 - 1875	Renaissance Revival
1810 - 1840	Regency	1850 - 1870	Italianate
1830 - 1860	Classical Revival	1860 - 1880	Second Empire
1850 - 1870	Gothic Revival	1885 - 1900	Queen Anne Revival
		1880 - 1910	Romanesque/Beaux Arts Chateau

(Humphreys and Sykes 1974:4-7).

The above generally are labelled "Victorian" architecture in Canada, but particular forms became associated with particular regions of Canada and took their names from the association. The mansard styles were associated in particular with Québec (Lessard and Marquis 1972:390). When fur traders established pièce sur pièce construction in the west, it became known as Red River Frame construction (Lehr 1980:188). The Gothic Revival farmhouse, with a central gable on the main facade became common enough in Ontario to be termed "Ontario Vernacular" when it was brought west by emigrants of Ontario (Melnik pers. comm. 1982).

Western Canadian Nineteenth Century Architecture

Prairie architecture of the nineteenth century reflected those North American (i.e. transplanted British) traditions in existence. Of these, the classical revival tradition with returned eaves, and column elements, was the strongest, coming from both eastern Canada and the U.S. where it was considered a revival of colonial styles (Humphreys and Sykes 1974:4; Kidney 1974:32). This was due, in part, to the popularity of this tradition in the east, and because of a phenomenon mentioned by Gowans (1966:photo 112) and Dick and Lebeuf (1980:2) which determines that frontier architecture will lag stylistically behind that of the originating source. American architecture spread westward at the time of the classical revival. Understandably, it would have become the norm of American, northwestern vernacular building which the late nineteenth century, conservative western builders drew upon as stylistic models (Lewis 1970:35).

Pattern books of house designs which were available in western centres, and through farm magazines such as Canada Farmer, Nor-West

Farmer, Farmers' Advocate (Dick and Lebeuf 1980:3, 4) perpetuated the popularity of the eastern North American house styles. The most influential of pattern book writers was A.J. Downing. Most notable of his publications were The Architecture of Country Houses (1850), Cottage Residences, Rural Architecture and Landscape Gardening (N.D.), and Rural Essays (1853). His ideas were widespread in the U.S.A. and, of course, would have proliferated the New England architecture of the mid-1800s about which he wrote. Many such pattern books were in circulation in Western Canada, and served to disseminate a particular set of concepts which influenced public taste in vernacular architecture. They included the works of other noted authors such as Woodward (1865), Audsly (1872), and Elder-Duncan (1910).

In addition to the pattern books of designs and advice, there were pattern books which served much like mail-order catalogues. Railway and lumber companies operating either for themselves or as agents for the saw mills and companies in B.C., produced books containing house designs from which the consumer could choose the house he/she wished cut and shipped, in pieces, to the place where it would be assembled. Ready-Made Houses: A New System of House Construction (Pariseau N.D.:appendix), and Colonization Construction Branch [CPR] Cottage Plans (CPR 1928), are examples of such books used in Alberta in the late nineteenth and early twentieth centuries. Houses produced and sold in this manner varied in price depending upon the desires of the purchaser. Mr. James Raddill purchased a pre-fabricated house from the Bow River Saw and Planing Mills at the turn of the century for \$135.56 (Walker in GIA 1884 - 1903:465). In addition, there could be a \$20.00-\$25.00 per carload fee for shipment of the house by rail (op. cit:letter June 5, 1891).

Mail order house buying presupposes the existence of a means of transportation - for the design book, and the building materials. It also presupposes industrial processes such as sawmills, nail manufacturers, sash and door manufacturers. By the period covered by this study, these were in existence, or anticipated within Alberta (see Table 2). Where the railway had not reached, or had not extended freight services, settlers had the choice of waiting until that did occur, utilizing local resources, or using wagon transport for building materials (M. Lang pers. comm.: 1982). Throughout the area of this study, an attempt was made to allow for all three means of access to materials.

Availability of, and accessibility to, building materials were among the factors which influenced the choice of these materials for their dwellings by settlers. It might be argued that stone should have been a frequently used construction material, in that respect, due to its abundance (as may be attested by many a farmer who has "harvested rocks"). Stone, however, required skilled and trained labour to be used properly. Also, because of the cold climate of the prairie regions, and especially the damage wreaked by frost, stone was not considered to be a preferred building material. It led to cold houses which were not very durable (Joseph Glass pers. comm. 1982; Pariseau N.D.:17). Climatic concerns were, therefore, taken into account in addition to economic concerns and availability of materials when Alberta's settlers built their dwellings. Cold winters necessitated houses which would resist the elements and provide a warm interior. The relatively short building season (which coincided with the farming season), in addition to the homestead patent requirements that a house be constructed, necessitated

a house which could be rapidly built by the settlers and a few helpers. The physical requirements of the prairie environment alone did not dictate the dwelling, designs chosen by settlers in Alberta. The traditions of Europe which accompanied the immigrants to Alberta have been examined. Rapoport notes:

...house form is not simply the result of physical forces or any single causal factor, but is the consequence of a whole range of socio-cultural factors seen in their broadest terms... I will call the socio-cultural forces primary and the others secondary, or modifying (1969:47).

Schlichtmann also comments:

Cultural transfer is always selective, even though the number of traits transferred may be large in some cases. The reason is that migration entails a change of the physical and social environment of the group, and in the new environment it may not be feasible and economical to produce certain traits...For example, houses may be built as they were in the old country...or the form and internal subdivision of a traditional house may be maintained, but the material may change (Schlichtmann 1977:21).

If, in this study, there were an attempt to control for the physically limiting factors - as there was (i.e. the settlers had similar if not equal access to materials, lived in a similar climate, during a similar period - architecturally - and were of the same occupation, if not income bracket - which was randomized through the sample), then Rapoport's "socio-cultural" factors, or what Schlichtmann calls the "new environment", must be examined for their influence upon vernacular dwellings.

The architectural traditions of the home areas of the settlers have been examined as have the architectural traditions extant in northern North America by the turn of the century. The houses built by the nineteenth century European and French-Canadian settlers in Alberta would have been influenced by all those factors and traditions mentioned above, and the actual buildings would have formed all of these factors into the settler's concept of a house, or in Glassie's words:

...the house is an expression of a cultural idea that valued the intellectual model over emotional need. It is not that the spaces provided by the house for human action were dysfunctional, but that people were willing to endure chilly corners or rooms that may have felt a bit too spacious or cramped in order to live in a house that was a perfect representation of an idea (1975:119).

The next chapters will examine those ideas expressed by the sample of settlers' houses studied, and will attempt to determine whether or how some of the influences discussed in this chapter were made manifest in the choice of house.

CHAPTER IV

PRESENTATION OF DATA

The selection of the sample of houses studied was discussed in Chapter 1. Although it was established that this was not a random sample in the purest sense, it was also established that statistical procedures performed on the sample can be used to describe and summarize data such that inferences may be drawn from them which are valid and useful to the archaeologist (see Thomas 1976:444; Doran and Hodson, 1974:96).

Bearing this in mind, frequency distributions were examined for each attribute in much the same manner South used to determine the Carolina Artifact Pattern (South 1977:102). In this case, however, ethnic group affiliation provided the basis for comparison of attribute frequency and percentage frequency, rather than site by artifact class. As South points out (op. cit:84), this method is one of pattern recognition "aimed at understanding the dynamics of past cultural systems," despite the fact that it is a statistically rather low-powered one.

Tables 4 and 5 present the assembled raw data with attribute labels and Tables 6 to 9 the distributions thus determined. The mode values for nominal attributes and mean values for the interval attributes were obtained from the data in order to give an overall view of the trends in each ethnic group's architecture. Figures 4 to 8 show the resultant composite views of the most common, and unique (represented by dotted lines) attributes. The diagrams so generated also provide a view of the architectural trends and materials preferred in Alberta for the period and type of structure discussed.

The attributes studied were taken primarily from the CIHB recording system, as mentioned. Each attribute, and its distribution for

each ethnic group, and the resulting pattern (as illustrated by Figures 4 to 8) will then be discussed and the raw data statistics, therefore, interpreted.

Attribute Frequencies for Nominal Data

The date of construction was the first attribute noted, but it will be considered later in this chapter.

PRESENT USE

Whether the house was inhabited or uninhabited - its "present use" was noted, not only to keep consistent with a CIHB attribute, but also as a control upon the sample. A Pearson's r point biserial correlation test was performed on the data to determine whether there was a relationship between the size of a house and its preservation, i.e. were only large houses still inhabited, hence preserved and thus biasing the sample? A correlation between present use and house length rendered an r value of 0.4172, and for present use to width $r = 0.1307$. Area was not used as a correlate in this instance since irregularly shaped buildings would not be reflected in, or may scew the correlations. As may be seen from the r values, there is little correlation between size and use of building, allowing this attribute to be a relatively randomly distributed one. With the exception of the Ukrainian houses, this is reflected in the common frequency distribution of a 60/40 or a 50/50 representation of abandoned to inhabited dwellings. The majority (83%) of Ukrainian houses studied were abandoned for reasons known to their earlier inhabitants. This factor, therefore, did not affect preservation if it was possible to study the extant houses. Likewise, larger size did not influence preservation in this instance. The fact that 17% of such houses

remain occupied does indicate that such houses were preserved within that ethnic community.

SITE

In the instances in which a house was moved from its original location, again for reasons known to former inhabitants, these were noted to avoid creating a misleading record. Oral histories were then employed to reconstruct details of the original construction, orientation, and situation of the building. The majority of buildings remained in situ and the largest number moved was four houses within the German ethnic group.

HALLS

The presence of a hall was used as an indication of the formalization of house functions into specific areas. Only the British exhibited a particular preference for entrance hallways within their houses, with a 52% absent and 48% present distribution. The Scandinavians appeared the next most inclined to incorporate an entrance hall with a 67.9% absent to 32.1% present distribution. However, the remaining groups indicated no preference for an entrance hall. Indeed, contrary to expectations, there were no examples of a hall in Ukrainian houses at all. As mentioned in Chapter 3, the seny was a common feature in Ukrainian architecture. The anomaly presented in this study may reflect the sample taken, or local preferences. It does offer a noted caveat for the remainder of the observed attributes, however, in not relying upon the expected.

STOREYS

A one-and-a-half storey building appears to have met with cross-cultural preference of approximately 50% to 60%. One storey buildings

hold an equal preference to the one-and-a-half for the Ukrainian group, to the exclusion of all other storey types. The Germans exhibited the strongest preference for buildings of more than one-and-a-half storeys, (26% of the sample) but this is not a marked difference from the other groups - the lowest of which was a 13% preference.

PLAN

Widthwise, rectangular house plans predominated for all five ethnic groups but did not claim a majority of cases, except for an 83.3% preference for the Ukrainian houses. The other noted preferences in plans were: for the British - a 26.7% preference for lengthwise rectangular houses; for the French-Canadians - a 16.7% preference for the same, although there appears to have been a wide distribution of choices in all categories (except cruciform), giving no clear-cut preference after widthwise rectangular. For the Germans, there was an almost equal choice of 23.3% square and 20% "L-shaped". The Scandinavians also favoured an "L-shaped" plan in 26.7% of cases, almost equalling the choice for widthwise rectangular of 30%.

EXTENSIONS

In all ethnic groups a lack of extensions proved to be the major choice, with an average approximate percentage frequency of 60. However, for the Scandinavians, only 40% of houses had no extensions. This is not a clear majority of cases, and in view of the above-mentioned choice for "L-shaped" houses, this is consistent. Although the other preferences for extensions are divided among several choices, those creating "L-shaped" plans, especially with rear extensions, predominate.

BASEMENT AREA

The presence and type of basement did show marked differences according to ethnic affiliation. Almost all British houses had a basement area with a partial basement occurring in 48.1% of cases. For the French-Canadians, however, most (51.9%) houses had no basement, and of those which did, the majority (29.6%) had only a dugout. An almost even choice was exhibited by the Germans for each type of basement from none to full, with the dugout taking the lead, however. Like the British, the Scandinavians preferred partial basements, and then dugouts. The dugout prevailed as the Ukrainian choice, followed by no basement at all. A split into two groups thus appears, which may be seen to be echoed by other attributes. If a more developed (partial full) basement were present, it would, in most cases, be found in a British, Scandinavian, or German house, while Ukrainian and French-Canadian houses showed no or minimal (dugout) basements.

FOUNDATIONS

Not unexpectedly, foundation materials reflect the preference for the presence of a basement. For the British, Scandinavian, and Germans, the majority of foundations were concrete. The French-Canadians, for the most part, chose a log sill foundation (53.6%) before one of concrete (25%). Ukrainian constructions utilized stone foundations in 53.6% of cases, and log sills for 32.1%. This pattern will relate to that of wall construction materials as well.

EXTERIOR WALLS - EARTH OR WOOD

There was only one case which was not Ukrainian which had an "earthen" exterior, and this was a stuccoed British house. Eighty-six point six

percent (86.6%) of Ukrainian houses sampled had an earthen exterior wall material of which 53.3% were mud plaster and 33.3% were coated with lime wash, as well. The other ethnic groups demonstrated a clear use of wood as the preferred exterior wall material. Clapboard found the most common usage, followed by shiplap. Where the Ukrainian population did use wood exteriors, shiplap was most common. The type of wooden exterior may reflect what was in stock in local lumber yards, but the use of earth for a building exterior is a strong indicator of (Ukrainian) ethnicity.

WALL CONSTRUCTION

To change the order of the recording system, momentarily, wall construction is examined here. Wood frame was the overwhelming preference of the British at 83.3%. French-Canadians and Germans showed an almost equal usage of wood frame and horizontal log construction. This was not so much the case for the Scandinavians who used log in 33.3% of instances, but had a clear preference (63.3%) for frame construction. Ukrainian houses sampled were constructed only of log - 96.7% horizontal and 3.3% vertical (i.e. one case). Choices for foundation material and basement area can thus be seen to coincide with the wall construction. Ukrainian log houses rested on stone supports to lessen the possibility of rotting (predominantly softwood) logs. A shallow basement only suits this construction, as proves to be the case, with dugouts being given preference. French-Canadians also frequently used log construction, although as seen in Chapter 3, they were more accustomed to the use of log sills. And this again is seen in the sample. This would preclude the use of a basement area (due to lack of structural support), as is the case in 51.9% of their houses studied. Where frame construction was used, basements are noted, and concrete is the preferred foundation material.

CORNER JOINT

This attribute relates directly to the wall construction method. Only those groups using log construction for exterior walls would be concerned with it. British and Scandinavians, therefore, did not have jointed corners in most cases. French-Canadians and Germans also had no noted corner joints in 60% and 57.1% of cases respectively. When this method was used for construction, the dovetail notch prevailed cross-culturally. Only the French-Canadians diverged from this method to any extent, with three cases (12%) of square notched corner joints. Not according to expectations, as expressed in Chapter 3, there was no indication of mortice and tenon joining in French-Canadian construction, nor saddle notching in German or Scandinavian houses sampled. Rather, the dovetail appears to have been a common corner construction method adopted once on the Canadian prairie.

BRICK

In only four instances - two German and two British - were bricks used for exterior walls. Three of these four cases are known to have been so built for ostentatious purposes. The Morrison house, near Wetaskiwin, was a reflection of Mr. Morrison's gold rush acquired wealth in the style of a solid red brick English manor house (pers. comm: Mrs. R. Mannion). The Krause House, near Morrison's, was an effort to "keep up with the Morrisons" for whom Mr. Krause had worked, and whom he wished to "one-up" once he, too, became affluent (pers. comm: Mr. Zilke). Likewise, the Wilson home near Gleichen was facaded in brick over its wood frame in order to be "a showplace" (pers. comm: Mrs. Wilson). There appears to have been a direct connection between the use of

brick and affluence, if it were available, as illustrated by Table 3 and were used almost universally as a chimney material but only used for exterior walls for purposes of ostentation.

COMPOSITION OR TILE

Stucco was not commonly used in construction, although it does appear in one case of the British, French-Canadian, and German groups.

SHEATHING, MAIN and OTHER FACADES

Sheathing is used here to mean a cladding over the constructed building, rather than an insulation layer within the wall construction, as the term is used by the CIHB, because it was not possible to destroy the houses enough to determine inter-wall construction. There is again a direct relationship between those buildings employing log construction and those of frame. Frame houses built by the British did not use sheathing in 83.3% of cases. Those houses of the French-Canadians, Germans, and Scandinavians, which in some cases did use logs, also used sheathing in some cases. Ukrainian log houses, as seen, were sheathed for the most part with mud plaster. Cross-culturally, the main face appears to have been treated the same as the other faces in terms of sheathing materials used. Only one German and one Ukrainian house exhibited a different treatment to the main facade.

EXTERIOR WALL MATERIAL

The use of extra exterior wall material type is also seen to be related to building construction. British, French-Canadian, German, and Scandinavians had no extra wall materials used in a majority of cases, although the Germans and French-Canadians each had additional materials in 36.7% of cases. They also used approximately 50% of log construction

each. Where these groups all did have extra material, wood predominated. Ukrainian houses, however, most frequently used extra materials, and of these mud plaster was present in some form in 86.6% of cases.

WALL DETAIL

End boards were almost universally present - as a means to prevent weathering, although they were less present in Ukrainian log construction (60% there as opposed to approximately 86% for the other ethnic groups).

INTERIOR WALL MATERIAL

For interior wall material, the Ukrainian houses are again typified by mud plaster, which was lime washed in 82.1% of cases. The remaining groups all preferred lime plaster for interior walls, and the French-Canadians, Germans and Scandinavian houses exhibited use of tongue and groove boards in addition to the plaster.

CHIMNEY LOCATION

Multiple chimneys were not the most common building practice. The British and Scandinavians had eight instances, each of multiple chimneys (26.6% of each sample). Chimney locations in British houses were scattered throughout the dwelling, although there was most often one central hearth. This was also the case for Scandinavian dwellings, although their extra chimney was most often located in a rear relation to the main one. If French-Canadian houses had multiple chimneys, these occurred in a line along the widthwise line, i.e. at each end of the building as per the style noted in Chapter 3. For the most part, however, one centrally located chimney was the choice of all five groups - most strongly for the Ukrainians and least strongly for the Germans, who also expressed a preference for one slightly offset to the left or right of the centre.

CHIMNEY MATERIALS, MAIN and OTHER CHIMNEYS

Chimneys were almost always made of brick which indicates the availability of the materials and reinforces its connection with affluence if only wealthy people built their entire house of it. Scandinavian houses showed the most diversity in chimney material, but they too used brick in 75.9% of cases.

ROOF SHAPE

A gabled roof was typically the most common. A low gable most suited Ukrainian builders, although they and the other groups made much use of the medium gable. Bell cast roofs were, for the most part, French-Canadian or German, and mansard roofs were exclusively French-Canadian. Hipped roofs, where noted, were found mostly on British houses. The truncated hip was popular among German builders, however, claiming 50% of the whole sample for this attribute.

ROOF TRIM - EAVES

A majority of Ukrainian houses had uncovered eaves and, therefore, exposed rafters. If the eaves were covered, the covering followed the pattern of other groups. A boxed cornice was the norm, often with a sloping soffit. Fascia coverings only and friezes were also used, though not to the same extent.

ROOF TRIM - RAKING

Where raking trim was present (i.e. a gabled, not a hipped roof) the boxed cornice was again the most common means of covering the verges, although more divergence in style was noted here than for the eaves.

ROOF TRIM SPECIAL FEATURES

Very few houses (12 in all) showed any form of special roof

decoration. Of those which did, Scandinavian houses had 50% of all cases (i.e. 6 in all) and the rest were divided among the other groups.

WINDOWS

Main windows were almost exclusively located on the lower main facade, and almost all windows were rectangular in shape, with flat heads and vertical sides. Surrounds of windows - namely heads, sides, and sills remained intact in a majority of houses studied. Heads and sides were usually undecorated and unshaped. The British did demonstrate an almost equal choice between plain and moulded surrounds. The Germans exhibited the next highest instance of this attribute. Of the five cases of shaped window heads, these are divided into two British and three French-Canadian. Preference for plain lug sills or slip sills follow a similar pattern, although the Ukrainians showed as much preference for slip sills as did the British, with the other groups heavily in favour of lug sills. All groups favoured and used wood construction for window surrounds.

It is within the surrounds, namely the window structure itself, that there occurs some difficulty. In an average of 10% of all cases studied, the windows were not present. This may have been due to vandalism, renovation, or removal. This is a rather high percentage of lost information. If it does not negate the use of window structure as a valid attribute for the purposes of this study, it places a caveat on the usefulness of the information obtained in that regard.

Main windows and other windows did show the same tendencies in actual structure, as they did in treatment of surrounds. However, it is less the case with window structure. For instance, where a sash and transom

may appear as a main window, it was never noted as an other window on the house. Likewise, fixed windows were more common for main than other windows (17 cases as opposed to 6 for other windows). An overwhelming majority of cases for all five groups presented a window composed of two (on upper and lower) double hung sash window containing two upper and two lower panes for each sash. The Scandinavians did exhibit a close second choice for one upper and one lower pane. Ukrainians demonstrated a unique type of window composed of one sash with four or six panes, but this occurred in only 20% of the Ukrainian cases studied.

BAY WINDOWS

Bay windows also were the exception rather than the rule for all five ethnic groups sampled. Of those groups which did build them, the British and Scandinavians each had six cases, and the Germans, two.

DORMERS

Only the British showed a strong inclination toward the use of dormer windows, having 53.3% of cases without, compared to the 70-96.7% range for the other groups. The type of dormer chosen varied, with an overhanging gable taking the lead for 23.3% of cases. British roofs were, on the whole, gabled as were other groups' roofs, but hipped roofs were more a British attribute, and this may relate to the presence of dormers.

SPECIAL WINDOWS

Special windows such as those of coloured or leaded panes were not common. French-Canadians had eight houses with this attribute, and the British had seven. Ukrainian houses had one such example.

NUMBER/TOTAL NUMBER OF WINDOWS

Within the main structure of the building (excluding porches, verandahs and sheds) the number of windows present for all groups was in

the 5-9 range most frequently, and this was especially so for the Ukrainians in 59% of cases. (Fewer than five windows were preferred in 20% of Ukrainian houses.) The other groups showed similar trends of between 40%-60% of houses having from 10 to 20 windows. Scandinavian and British houses most commonly had more than 20 windows of all the groups, but this is only represented by three British and two Scandinavian houses. If attached and adjacent structured are included, the actual number of windows present does not change the pattern of number of windows dramatically. House size and room number (to be discussed later) are factors which should be considered when using window number as a criterion for differentiation by ethnic affiliation since they may be related attributes. (This was not tested because of the 10% absence of windows, which would have scewed results.)

DOORS

Where the absence of windows issued a caveat, the absence of doors, and especially doors other than the main entrances, also demands such a warning. For surrounds, the information is not available in 3%-7% of cases. This figure jumps to 27%, 35%, or 33% when considering such attributes as door type for other than the main door, door panel type, and presence of glazing in a door. Hence, information will again be given with the understanding that these attributes are not best suited to the purposes of this study.

Main doors were placed in a central location of the main facade in approximately 60% of cases for the British, Germans, and Scandinavians. The French-Canadians favoured this location 43.3% of the time, and were also inclined toward doors offset to the left on the main facade (26.7%) and doors centrally located on the gable end (16.7%). A double main

entrance on the main facade was primarily a Ukrainian house trait, although it only occurred in 10% of Ukrainian houses. Fifty-three point three per cent (53.3%) of Ukrainian houses exhibited a central main door on the main facade with other door locations distributed throughout other categories.


Doors other than those on the main facade, but on the first floor level, were found in 64% of the samples studied. Of these, the predominant locations for another door were the centre of the facade (17% of cases) and offset to the right or left on the width-wise facade (16% each of the group's cases).

Doors located on upper storeys or in basements were rare, occurring in only 8% and 11% of the houses studied, respectively. Upper storey doors were most commonly centrally located along the main facade and most common to the German group. Basement entrance doors were most commonly also centrally located along a width-wise facade, or offset to the left of the same facade.

Main door orientation was generally to the south or east. British and Germans favoured a southern orientation in 46% and 43% of cases, respectively. Ukrainian houses, however, were oriented to the south in 83.3% of cases, indicating a clear preference for a southward orientation. French-Canadians and Scandinavians only oriented 23% and 25% of houses southward respectively, both preferring an eastern orientation in 30% and 32% of cases. British and German builders chose an eastern orientation 25% and 27% of the time. The French-Canadians and Scandinavians were the groups which chose directions other than east or south for door orientation most frequently. The

other choices were distributed throughout the other points of the compass, with the Scandinavians choosing the west in 21% of cases.

Of those doors present in the study sample, the following characteristics were noted: A plain set of main door surrounds (head and sides) was the choice for each group in a majority of instances (from 63% for British to 80% for heads alone). A moulded surround was chosen secondarily in each case ranging from 20% (Ukrainians) to 33% (British in frequency). The French-Canadians demonstrated more elaborate treatment of door surrounds in 14% of their dwellings. The only other group to do so was the British as represented by one house.

The absence of an architrave was almost a unanimous choice across ethnic barriers as was the absence of a transom or other lighting of door surrounds. Door type varied widely. If a preference can be noted, it would be the same for each group - i.e. four panels arranged in a quartered pattern (). Panels in the doors showed a trend to be either bevelled (in 61% of Scandinavian to 71% of Ukrainian cases) or recessed (20% of French-Canadians to 36% of British). There were also 16% of French-Canadian doors studied which were flush.

Door glazing was found in houses of each ethnic group, but in a majority of cases for the British (64%) and Scandinavians (57%). French-Canadians did have 44% of houses with this attribute, and the Germans 32%. The Ukrainians, however, had an 88% absence of door glazing.

STAIRS

The presence of stairs was a less distributed attribute than presence of doors. French-Canadians and Ukrainians showed a 53% and 80% preference respectively for absence of entrance stairs. Where stairs

were present, all groups favoured a central location on the main ground floor facade. These were found in 73% of British and 66% of Scandinavian houses. The Germans had a slight preference for a front stair over the absence of one. A similar (though diminished in number of occurrences) pattern is found for stairs to doors other than the main door. A straight, face-on stair was favoured by each group which had stairs.

Interior stairs were present in a majority of cases for each ethnic group, although no interior staircase was the most frequent (if not majority) category noted for French-Canadians, Germans, and Ukrainians. Stair location varied, but one in the centre of the house was the most frequent for all but the Ukrainian sample, which showed a trend favouring a staircase in the centre, but at the rear of the building. The French-Canadians showed an equal frequency of houses with a staircase at the right side of the house.

PORCHES AND GALLERIES

Main porches were not present in a majority of the Ukrainian houses sampled and in 40% of the French-Canadian houses sampled. The remaining groups did exhibit porches in a majority of cases, and where present, the open verandah style was the most frequent. Also, where present, main porches were most commonly located along the main front facade of the house and additional porches at the rear.

The incidence of secondary (e.g. rear) porches was not found in a majority of cases for each ethnic group, although Scandinavian houses showed this trait more frequently than houses of the other groups. When an additional porch was present, the closed in porch was most common for all groups.

Supports for porches, when used, were most commonly wood posts for the main porch, and walls for the closed in porch.

Porches were supported primarily by wood with concrete as the second most common support material for each group but the Ukrainians, whose houses showed a secondary preference for stone porch foundations.

HEAT

Heating was found to be by stove in a majority of cases (i.e. 87% - 100%) for all groups but only 56% for the British. British houses showed the most variety of heating methods, with a furnace being the second most common means after stoves.


PLUMBING

Plumbing was almost entirely all outdoor (i.e. walls, outhouses) for all groups.

PROXIMITY TO OUTBUILDINGS

The proximity to the outbuildings surrounding the house lay in the 100-500 ft. (30-152 m) range for the majority of cases in each group, with a secondary preference for 0-100 ft. (0-30 m) for all but the British group, which placed outbuildings 500-1,000 ft. (152-305 m) from the house as frequently as 0-100 ft. British measures are used for recording and then converted to metric measures because structures were built in British rather than metric units).

LAYOUT

The layout of the outbuildings was scattered in a majority of British and French-Canadian houses; in an inverted "u" () for a majority of Ukrainian houses, and most frequently scattered for the remaining groups. All groups hence exhibited the same trends in having

outbuildings, shrubbery or low trees around the house, and no fence around the house, in a majority of cases.

Interval Data Frequencies


The interval data collected were widely varied due to choice of ethnic groups such that it was less meaningful to give "most frequent" attributes (i.e. length of 8.02 m may occur twice and 8.03 m four times, etc.). Consequently, these data were grouped into workable intervals for each variable, and the most common frequencies for these intervals will be noted for each ethnic group (so as to be comparable to mode values of nominal data, by not seeming to rely upon interval data made to carry more weight by making them undergo different statistical tests).



Mean statistics will also be given, for the sake of information, though. These data may be found in chart form in Tables 8 and 9.

From these data, trends in house size are notable. Ukrainian houses sampled indicate that smaller (4-5 m long and 8-9 m wide) houses were most common. The other ethnic groups built larger houses, especially the French-Canadians who frequently built houses longer than 11 metres in length and width.

Ukrainian houses also demonstrated fewer rooms than other groups sampled (i.e. a mean of four versus the six or seven of the other groups), and a smaller number of windows in their structure.

The interior walls of Ukrainian houses sampled were more frequently thicker than those of the other groups.

In terms of building shape - as indicated by length of width ratio, British houses were more frequently longer than wide, i.e.  , although

approaching a square (as seen in the mean ratio of 1.05). French-Canadian houses showed a more marked frequency of lengthwise houses, i.e. , although in mean, and by second most common frequency figures, the widthwise house, i.e.  was also common. A square to widthwise shaped house was most common for the German houses sampled, and the Scandinavian houses were equally likely to have been lengthwise, or widthwise to square, although both German and Scandinavian houses tended to a more widthwise shape. Ukrainian houses were decidedly widthwise at a ratio of 1.5 to 2 times greater width than length of main facade.

Chimney number, door number, and window pane number remained almost constant across all five ethnic groups with only a slight variation in window pane number (in the mean figures) for the Ukrainian houses which appeared to have more than the usual two upper and lower panes. (In fact, a single sash, six pane window was a unique feature of some Ukrainian houses found in the sample.)

Figures 4 to 8 show composite reconstructed sketches of the houses most common to each ethnic group, based on most frequently occurring nominal variables and mean interval variables (for diagramatic purposes).

Some conventions used in these renditions may bear explanation. A dotted line used to indicate an attribute means that this attribute, although not most frequently found, was noted to be unique to the houses of that ethnic group (i.e. if any group were to have that house attribute, the one illustrated would). These "dotted attributes" may be found on the main house sketch, or a smaller sketch to the side. Such small sketches also are used to show house attributes which were

unique to a given group and/or the second most (where this was a high frequency) common occurring house attributes. The figures are only to help conceptualize the data obtained from this study, and do not represent conclusions derived from the data.

In order to try to draw some conclusions about the relationship of house attributes to ethnic origin of original house owner, some statistical tests were performed on the data. The results of these tests are found in Tables 6 and 7.

Chi Square Statistics

The nominal data were subjected to χ^2 tests which were the most powerful tests feasible, given the nature of the data. When necessary (to achieve a valid statistical result) data categories were collapsed to still be within the range of validity ascribed by Baker and Lee (1975:180). When such collapsing of tables was undertaken, it was noted on the tables.

Chi square tests were performed for each attribute in relation to these other variables, namely: ethnic affiliation of owner, date of construction, town of construction. It was thought that such testing would indicate whether there were indeed a relationship between the attributes and the variables, which was not merely chance. Conversely, such testing provides a means of noting which attributes are most usable in determining the presence of such relationships. This may not be inferred from the statistical tests themselves (as with factor analysis) because of the low-powered nature of the χ^2 test. Rather, it can only be discerned which attributes produce valid statistical results, and of these, which indicate a relationship to the variables.

Tests were conducted against the variables of date and town of construction to determine whether other reasons may have been responsible for the differences in house attribute patterning, than ethnic affiliation.

DATE OF CONSTRUCTION

Date of construction proved to be a poor variable with which to test this question, much less to establish a relationship to attribute patterning. The dates were grouped into four decade categories for the test so that expected frequencies of cells would be valid, if open to loss of information, through such collapsing. Even with this precaution, valid statistics were only produced in eleven out of the one hundred and eleven tests conducted, and of these, only three (collapsed as to whether the building was log or frame; whether the door had glazing; presence/absence of a second exterior stairs) indicated that a non-random relationship existed between date of construction and the attribute tested (i.e. the χ^2 statistic was greater than the critical value). One may not conclude that date of construction is not related to attribute patterning. Indeed, it is important to note that log and frame dwellings are date sensitive (a caveat on this point will follow). One may only conclude that date of construction does not provide as much information about attribute patterning as do the variables of town of construction and ethnic group affiliation, which produced 23 and 24 valid statistics respectively.

TOWN OF CONSTRUCTION

As a variable, town of construction produced similar cell frequency count problems as the date variable. Consequently, the tests were

conducted again with the 12 towns collapsed to three regions: i) Northmost to Red Deer, ii) Red Deer to High River, iii) High River to Pincher Creek - each area of approximately equal size, and each containing at least one major centre from which materials for building would be available. Where necessary to further collapse the cells by attribute as well as town, to produce a valid statistic, this was also done and noted in Table 6. All valid town statistics are, therefore, the result of collapsing χ^2 contingency tables. Information is thus lost, but some information is still salvaged to be tested of which nine tests revealed a relationship did exist between attribute and town of construction (i.e. log/frame construction, sheathing, p/a exterior wall mud, p/a interior wall mud, chloc centre/off centre, p/a window head decoration - main window - other windows, p/a SPWIN, DGLAZ).

The variable of town of construction, therefore, does offer another limited relationship to house attribute patterning. This may be due to availability of materials locally; local tastes of preferences; or the habits of local builders. It may, however, also relate to ethnic affiliation, and this must also be noted if considering the date variable. As mentioned in Chapter 2, block settlements were frequently employed in Alberta - as is especially evident in the Ukrainian sample (see map Figure 2). Thus town may affect attributes due to ethnic makeup of the towns' physical locations. Likewise, date may be tied to ethnic affiliation if the earlier settlers who tended to employ log construction rather than frame were of a particular ethnic group (e.g. the French-Canadians or Ukrainians were early settlers who favoured log construction, as in Chapter 3).

It was not possible, given the sample of extant houses remaining for the study, and the nature of nominal data, to control for these factors separately. Because some houses only remain standing in block settlement areas, these had to be used and could not be randomized by location throughout the sample. "Date" was randomized through the sample more than "town" but still was reflected in the houses extant, in a given area for a given group. Factor analysis or such high-powered, inferential tests do not have meaning when applied to nominal data.

ETHNIC AFFILIATION

As a result, it cannot be concluded that date or town of construction do not provide models of attribute patterning for housing. However, the fact that these variables are linked to the ethnic variable does not diminish the validity of the ethnic variable as a contributing factor to attribute patterning. Ethnic affiliation produced 17 instances in which a relationship did exist between the variable and attribute patterning (see Table 6 to note which attributes).

Therefore, a non-random relationship was established in at least 17 instances between ethnic affiliation and the nominal attributes analysed in the study. The observations concerning most common choices exhibited per attribute by a given ethnic group's houses, particularly for the 17 related variables produces a pattern or model for an ethnic group's house design.

ANOVA Statistics

The interval data collected were also subjected to statistical tests to determine the relationship of attributes to the variables of date, town and ethnic group. Although it is possible to conduct more

high-powered tests on interval data, the one-way analysis of variance (ANOVA) test at .05 α level was chosen for this purpose because it is the statistical test for interval data which most closely resembles, in application, the χ^2 test used on the nominal data. It was felt that statistical tests performed on the data should be as consistent as possible so as not to assign extra weight to any given variable by conducting a different test upon it which would be based upon the a-priori assumption that it was a more meaningful variable.

A similar series of observations occurred for the interval as for the nominal data. When tested by date of construction, only one attribute (Door No.) of the 16 tested gave a statistic which indicated a non-random relationship. Ethnic group and "town" produced ten and nine instances respectively in which attributes and variables were non-randomly related (see Table 7). The interval attributes which best indicate these relationships appear to be: length, ratio, thickness of main floor wall, numbers of rooms - overall, and by floor, number of windows, and number of doors. The number of window panes was not indicative of a relationship to variables, nor was width. Foundation thickness was marginally related to ethnic group.

Additional Statistical Tests

In addition to the above statistical tests, several others were performed upon the data to determine whether there were relationships between attributes which would be of use to the archaeologist (for the sake of providing information about known, tested attributes, rather than assigning attribute weight). ANOVA testing noted a non-random relationship for some metric attributes by ethnic group. The

strength of these relationships is not indicated by the ANOVA statistics. Nominal and interval variables may be correlated using Asymetric Lambda. This test indicates the degree to which the dependent variable may be predicted if the independent variable (ethnicity) is known. A value of 1.0 indicates no error in prediction. Attributes with positive ANOVA statistics were tested giving length (0.22), width (0.12), foundation thickness (0.12), main wall thickness (0.10) - all indicating little strength.

Pearson's r tests were conducted to determine whether a) the size and continued use/abandonment of a house, b) foundation thickness and main wall thickness, c) foundation thickness and number of storeys were related.

The use test was done as a control to determine whether the samples were skewed by houses of a larger size which were extant because they were still inhabited, while the smaller ones had been abandoned. This test and its results (i.e. little relationship) were recorded at the opening of this chapter (p. 80).

The relation of FTHK to MTHK was noted to be slim as well, with an r value of 0.38, and storey number to FTHK gave an r value of 0.02 - insufficient to indicate a relationship.

The attributes used for this study were analysed using frequency and percentage calculations to note trends of preference by each ethnic group. The attributes were also tested to determine whether there was a valid, non-random relationship between them and ethnic group, date of construction and/or town of construction.

It was determined that non-random relationships did exist between certain attributes and the three variables, as seen in Tables 6 and 7.

Of these, date of construction proved to be the variable with the fewest number of relationships. Town and ethnic group showed almost equal numbers of relationships. This may be because each variable is valid on its own, or because ethnic groups frequently settled in block areas and the two variables are, therefore, related.

The preferences shown per each attribute by each ethnic group are noted in Table 4 and illustrated in Figures 4 to 8.

Models have thus been determined which indicate a) a relationship between house attributes and ethnic group, town, and date of construction, b) preferences of house attributes by ethnic groups. A 'model' is here taken to follow Clark's definition: "a piece of machinery that relates observations to theoretical ideas" (1972:1).

The theoretical ideas tested in this study were that there would exist a relationship between the ethnic affiliation of the owner/builder and the attributes of the house he/she produced, therefore, rejecting the null hypotheses tested in the study on a per attribute basis. The observations noted in the study bear this out, and also produce models which relate town, and date of construction to house attributes. Clark suggests that "it is possible, permissible, and discernable to have more than one model of different aspects of a single situation" (op. cit:4). Therefore, the "town" and "date" models will not be discounted as explanations of house attribute patterning. Clark does go on to say that "a choice may be made between models in such a way that successively more powerful models are employed" (ibid.).

Statistically, this selection is not possible, since nominal data are not subject to high-powered tests. The interval data do not indicate a more powerful choice either since they were tested with tests of similar type to those for the nominal data. That ethnic affiliation is related to housing pattern is established, and the specific patterns noted. Because town, and date of construction are also related to ethnic affiliation, it is the ethnic model which is, therefore, selected to be central to this study.

The next chapter will examine the application of this model to archaeological investigation.

CHAPTER V

AN ARCHAEOLOGICAL PERSPECTIVE

The mandates established by Fish, South, or Noel-Hume, and mentioned in the introduction, have been met, in part, by this study. Potential archaeological resources have been catalogued and studied before they are lost to study. This has provided a series of observations which form patterns based on a relationship between attributes and ethnic group, rejecting the null hypotheses established for testing on a per attribute basis, in the tradition of South's Carolina or Frontier artifact patterns. The patterns of this study are not archaeologically derived, i.e. from excavation, as were South's. However, they provided models against which archaeological investigation may be tested in the same vein as South's studies. As Clarke puts it:

"If the real data display the regularity predicted then it [sic] should fulfill some already established conditions. If the real data depart from the predicted pattern, then some conditions are not fulfilled, and the nature of the discrepancy may suggest the divergent conditions responsible for the anomaly" (1968:150).

Binford reiterates this: "the demonstration of empirical "regularities" simply documents similarities which need to be explained; it is to be hoped that the explanations offered would deal with cultural or ecological processes operative in the past" (1968:15).

This study has determined models of house attribute patterning based on observations in a given sample (see Chapter 4). As such, this model provides the "predicted pattern" mentioned by Clarke or the

"empirical regularities" of Binford, against which anomalies can be compared for investigation.

On one level, the cultural processes operative which are responsible for these regularities have been demonstrated to be ethnic in origin. Other factors such as town, date of construction, availability and type of building material, and wealth of builder have also been mentioned and either controlled for, randomized within the study sample, or subsumed by the ethnic model.

On another level, the actual processes responsible for the production of ethnically identifiable house attribute patterns (i.e. why groups built houses differently from each other) can only be briefly and speculatively dealt with in this study since they involve many factors which are subject to the whims of human nature and are, therefore, not quantifiable. Or, as Spaulding in Binford puts it, "the explanatory generalizations of history are characteristically matters of common knowledge on human dispositions or motivations and are quite properly implicit rather than explicit in the historical narrative" (1968:35).

The process responsible for house patterning is highly influenced by general factors including exposure to urban or international architectural concepts (as mentioned in Chapter 3), and rate of assimilation of each ethnic group into the developing mainstream of society. Indeed, this was another factor controlled for in the study by choosing houses of immigrants who built their houses within approximately five years of arrival in Western Canada. Why these rates differed for each group may be examined in view of the information presented in Chapter 2. This study notes a similarity among houses of British,

German, or Swedish, with the French-Canadian and Ukrainian houses being different from the latter three groups, and more similar to each other (see Figures 4 to 8).

Gibbon is cited in Chapter 2 as stating that German and Scandinavian immigrants were sought by the Canadian government since they were considered most like British Canadians and readily assimilable. Ukrainian immigrants, on the other hand, as seen again in Chapter 2, were met with reluctance and even hostility. They were first placed in block settlements by the government, and then an attempt was made to disperse them - an attempt which they opposed. Further, the Ukrainian immigrants were immediately beset by Roman Catholics, then Protestant clergy determined to proselytise them (see Ukrainian Pioneer Association 1970:17; Hurt 1979:36). Once again they vigorously opposed the attempts to change their cultural heritage.

The French-Canadian presence was composed of people demonstrating a double determination. Firstly, they had had to go against the wishes of the Québec clergy by settling in the west, and once there, were secondly, a part of a church-led effort to establish and maintain a Francophone presence in the North-West Territories.

Assimilation and the rate thereof have been examined by several sources (Francis 1976:254; Spiro 1955:1243; Wells 1975:321, 322). Their general consensus appears to be that it is a twofold process involving a) whether the host group is willing to accept the immigrant group to be on an equal social level, and b) whether the immigrant group desires to be incorporated into the host group - for whatever reasons. Price phrases this as follows:

An immigrant must rise above the level of "dissatisfaction" if ever dissatisfied, and attain a certain degree of "satisfaction" with his new life before he can identify himself with the host population (i.e. develops a feeling that he is like, and desires to become more like members of the host society) (1969:223).

On either side of the issue, acceptance of and acceptance by the host population it can be seen that the British, Germans, and Scandinavians were assimilable, and the Ukrainian and French-Canadian populations less so, at least in the first generation (who were the subject of this study). The Ukrainians and French-Canadians were stigmatized by the prevailing society in Alberta - a process noted by Wells as leading to an emphasis upon ethnic identity (1975:322). Also, these groups, as a result and through their own motivations, rejected assimilation and clung to their identity. Rapoport has noted that cultural survival and house form may be linked (1976:11). So, it is no surprise that ethnic groups which are stigmatized, and which turn in unto themselves will demonstrate their ethnicity in their housing, as illustrated by this study.

Spaulding has been cited as saying explanations such as the above are implicit in history. He also says in the same instance that this cannot be acceptable as stringent enough for anthropological study (1968:35).

As such, the explanation of the ethnically influenced house patterning being related to a nebulous series of factors affecting assimilation rate of the ethnic groups must remain speculative.

For the purpose of this study, therefore, the existence of ethnically influenced vernacular architecture was taken as an hypothesis and tested by the gathering and analysis of data.

The methodology for obtaining the models thus derived may be termed ethnoarchaeological, using an amalgam of the definitions for ethnoarchaeology of Tringham in Gould: "the structure for a series of observations on behavioural patterns of living societies which are designed to answer archaeologically oriented questions" (1978:170); Schiffer in Gould: "the study of material culture in a systemic context for the purpose of acquiring information, both specific and general, that will be useful in archaeological investigation" (op. cit: 230), and especially Gould: "an examination of human behaviour in relation to materials and material residues in order to discover relationships that explain how and under what conditions certain kinds of traditional behaviour may have been important in relation to overall processes of human adaptation" (1980:44).

The materials studied in this report were only sometimes part of a continuing system. Rather, this study was "betwixt and between" in that it examined material culture which was no longer really systemic and not yet archaeological, i.e. undergoing Schiffer's S-A transforms (Schiffer 1976:33). The hope was that information could be gathered about attribute patterns and preferences before it was obscured by transformation to the archaeological record alone. This information may then be applied to future archaeological investigations, both as a test of the models created in this study, and as a model against which archaeologically obtained patterns and anomalies may be

compared. Therefore, the study is seen to be well grounded in ethno-archaeological method as defined above, as well as historical archaeological practices since its opening mandate came from that field.

As already noted, studies of ethnically preferred attributes and artifacts are not uncommon throughout the discipline of archaeology (see Hodder 1982; Hodder N.D.; Leone in Schulyer 1978; Deetz and Deflethson 1972; David and Hennig 1972; Longacre in Leone 1972:316 - 319).

Canadian archaeology, specifically historical archaeology, presents a scant few of similar pattern recognition studies. Reid mentions the lack of published, much less pattern oriented data, with the exception of a half a dozen excavations of forts (military and fur trade) (1977:93). When an effort is made in this direction, it appears that there continues to be a token of publishing data in categories used by South in his Carolina artifact pattern (see Kennedy 1982: Table 2; Adams:1978; Losey et. al. 1977).

Because of the paucity of published data and the recognition of patterning except on an infra-site basis (see Adams 1978) where data are published, the literature to date is not a source of the type of patterns of artifacts or structural remains which may be recovered on an historic (domestic vernacular) site. However, a survey of the extant data regarding historic Canadian excavations - with a special emphasis on western Canada (since these will presumably be representative of similar environmental and hence preservation conditions as this study) does provide an idea of the kinds of remains noted in this study which may remain visible in the archaeological record. Also, because many

archaeological investigations have been geared to reconstruction of a particular structure, the literature does provide examples of how a structure may be recreated from archaeologically recovered remains.

Working from below ground upwards:

Cellar depressions have been noted extant at Rocky Mountain House, Alberta (Steer and Rogers 1975-77:99), Dawson City (Burley and Ross 1979:9), Fort Herchner (op. cit:40), Batoche (Donahue, Hall, and Neal 1978:37, 50; Burley 1980:36), and Fort Victoria (Losey et. al. 1977:13). In some instances, the remains of wood cribbing were present. All sites above date to the period covered by this study, or earlier, and hence indicate the preservation of wood cribbing like-dated structures.

Likewise, foundations and flooring materials were excavated in various states of preservation from the unaltered stone of Motherwell House (Adams, Glover and Warrack 1978:6), to easily distinguished sleepers and joists of the Lac La Loche Northwest Company trading post (Steer 1977:89-96), to the all but disintegrated sill remains at Batoche (Donahue, Hall and Patt 1978:19).

It appears, from the above excavations, that local environment and taphonomic or preservative conditions are more responsible for archaeological visibility, especially of wood remains than are either of building material used or date of construction. The Lac La Loche site dated to the late eighteenth century, compared to the nineteenth century construction and abandonment date of the Batoche site. Also, construction on the Lac La Loche site and the Le Tendre house at Batoche was of poplar - a very soft wood and one frequently used by the settlers of Alberta as noted in this study.

The construction of the superstructure, once again, is discernible within the archaeological record according to local preservation conditions - including the incidence of forest or prairie fire. Ash and burned chinking, nonetheless, indicated a wooden wall (therefore likely log construction) at the once burned Lac La Loche site (see Steer 1977:96). Chinking was also recovered and noted as evidence of log wall construction at Rocky Mountain House (Steer and Rogers 1977: 115) and at Batoche (Donahue, Hall and Patt 1978:37). Some wood wall remains were found on top of the sills at Fort Victoria (Losey et. al. 1977:11) and at Lac La Loche (Steer 1977:96).

Shiplap and other board construction of walls was also preserved, if not in quantity at Fort Battleford (Hildebrandt 1979:24) and Motherwell homestead (Adams 1978:100).

Brick wall construction was deduced archaeologically from the amount of brick recovered at Fisgard Island, B.C. (Steer, Rosser and Cadden 1982:25).

The presence of porches was noted at Fort Battleford (Hildebrandt 1979:33) and the Motherwell Homestead because of soil differences and discolourations (Adams, Glover and Warrack 1978:8). Similar soil related evidence was used as well at the Motherwell Homestead (ibid.) and also at Lac La Loche (Steer 1977:99) to note placement of entrances (i.e. doors) to the structures studied.

Doors and window sills, surrounds and hardware have also been recovered on several sites (see Steer, Rosser and Cadden 1982; Adams 1978; Greenough 1980:172) and in the cases of Fisgard Island and the Halifax Citadel to such a state of preservation as to suggest the

hanging of the sash. Greenough notes, however, that so many windows were missing as to not provide enough information for his study (1980:1). This was certainly found to be the case found in the course of this study. Only Lee appears to have attempted to use pane glass remains recovered to indicate window number (1976:39). Her study was inconclusive, though, due to site disturbance. Loy and Sneed used window glass concentrations around the building to indicate window placement and number (1973:151).

Room number has not been readily deduced from structural remains. However, as South discovered (1977:77) and as noted by Adams at the Motherwell Homestead (1978:xi) artifact patterning within a structure may indicate activity areas within a house and hence room placement and number (particularly of a ground floor).

Roofing materials have been recovered from several sites (Steer, Rosser and Cadden 1982; Hildebrandt 1979).

The above has not been an exhaustive examination of the historical archaeological record (emphasizing western Canada), although it has been an extensive one. From it, the following may be realized:

- 1) that architectural elements of wood, metal, clay, brick, and glass have been recovered archaeologically from sites dating to this study's time frame or a century or more earlier. The implication is, therefore, that in terms of archaeological visibility, given similar environmental conditions for preservation (which is why examples were concentrated in western Canada - for comparison) it is feasible to retrieve such architectural elements from farmhouses of the settlement period which have been incorporated into the archaeological record;

2) that the types of architectural elements which have remained archaeologically visible, from cellars to roofing elements, include many of those attributes tested for within the scope of this study. It has been established, therefore, that it is also feasible to test archaeologically for many of the specific attributes used in this study.

Although the types of buildings included in the above discussion were not all permanent family dwellings, as in this study, they were made the basis of comparison when extrapolated into the archaeological record because they were buildings, and the common ground was seen to be archaeological visibility of architectural elements.

Conclusions

The case presented by this study has fulfilled the mandate set out at its onset, namely to examine a series of houses built by ethnically diverse peoples, from an archaeological perspective (i.e. involving those attributes which may be tested for archaeologically) in an effort to determine whether the ethnic affiliation of those persons would be reflected in the house attributes. The relationship of ethnicity and house attribute patterning were tested for using Chi square or ANOVA statistical tests. Because the tests were conducted on a per attribute basis, the relationship is outlined on a per attribute basis. The null hypothesis - that there was no (non-random) relationship between ethnicity and attribute patterning is seen to be rejected for the following attributes: hall presence, basement area, foundations, exterior wall mud plaster, log or frame construction, sheathing, interior wall mud plaster, central chimney, boxed eaves, decorated window head, window sill,

dormer, stair location, length, ratio, foundation thickness, main wall thickness, room number, room number first floor, room number second floor, window numbers, door number.

House attribute patterning and its non-random relationship to the variables of Town (or Area) of Construction and Date of Construction were also tested for. The null hypothesis in these instances were rejected on a per attribute basis as follows: for "Town" - log or frame construction, sheathing, exterior wall mud plaster, interior wall mud plaster, central chimney, decorated window head, decorated other window head, special window, door glazing, internal stair, length, ratio, main wall thickness, room number, window numbers, door number - and for "Date of Construction" - log or frame construction, door glazing, other outer stair, door number.

Although the "Date" and "Town" models of patterning may not be dismissed, it has been seen that they may be subsumed by the "ethnicity" model. Links between ethnicity and house attribute patterning have, therefore, been established for those houses listed in Table 10.

The implicit causes for the patterning exhibited (i.e. why one ethnic group did or did not show house attribute preference by frequency (as recorded in Table 4) have been examined in terms of settlement and architectural background for each ethnic group. Such examinations point to the degree of tenacity which each group felt necessary for its own identity, and the physical portrayal thereof in house construction. Because the reasons for the exhibited patterning rest in human behaviour, they may be examined, but are not readily determined quantifiably.

What has been determined is that there is an observable relationship between house attributes and ethnic affiliation of original owner. The frequency with which an ethnic group utilized particular attributes for house construction indicates that ethnic group's preference for those given attributes. A model is, therefore, generated which may be used by the archaeologist to suggest whether a given attribute is likely to be represented in the house of one ethnic group or another (e.g. the presence of mud plaster on exterior walls showed a percentage frequency for each of the five ethnic groups of: British - 0% of houses, French-Canadian - 0%, German - 0%, Scandinavian - 0%, Ukrainian - 86.6%. It is, therefore, likely that the house is of Ukrainian, rather than the other groups' origins, and further testing of this may then be conducted.) The frequency relationships allow for the comparison of further observations so that similarities may strengthen the frequency model, and anomalies refine it, and point to avenues of further study. In South's words,

If the cause (of differences in percentage/frequency) observations can be seen as the result of specialized behaviour, then these variables may take on significance in identifying such behaviour through contrasting frequencies, i.e. we ask "why?" (1977:102).

Such a situation answers well Binford's charge (1968:20) that too often archaeological laws which are established on empirical grounds are readily destroyed by just one contrary empirical observation. For this reason, the models entailed in this study are not considered to represent "laws". This is a distinctly positive factor, though, since

further observations in the same method as those of this study can only add to the study at hand, not detract from it. If the statistical relationships thus found reflect those of this study, the results of this study will be strengthened. If anomalies arise, the models established may be refined, i.e. "we can then ask why?"

There are a variety of types of questions the archaeologist may wish to explore when trying to determine "why". This study offers some for consideration.

First, this study offers a question in the form of a mandate for archaeological research. With the frequency models established in this study, an archaeologist may choose to excavate a house of known ethnic affiliation and seek to determine a relationship between archaeologically recovered architectural elements and ethnicity.

Questions relating directly to such an investigation through excavation include:

- 1) Which attributes should be noted/tested for as sensitive to ethnicity?
- 2) Which attributes have shown themselves to remain archaeologically visible and, therefore, testable?
- 3) How do architectural elements excavated compare to those tested for when the house was still in the (semi) systemic context? (e.g. what quantities of building materials are present from which valid and related conclusions may be drawn - how can number of windows be determined from the archaeological record?)

This study proposes some direction for archaeological research based in these questions. Ethnicity sensitive attributes have been determined both through goodness of fit statistical tests and frequency preference

models. An examination of previous historical archaeological work in western Canada has provided an idea of the archaeological visibility of certain house attributes and of some tests done to determine relation of archaeologically recovered material culture to systematic material culture (e.g. Lee 1976).

Only further testing of the models established herein may indicate their value to archaeological investigation. The archaeologist may be able to use this study as a base from which to launch further studies as suggested by South's mandate. Does artifact patterning relate to ethnicity within a structure? and what information would such patterning provide about the structure? (e.g. Do several artifact clusters indicate several ground floor rooms or only several activity areas but a smaller number of rooms - particularly if the house is Ukrainian and, according to this study, may have only two ground floor rooms?)

This study has answered its opening mandate; tested the proposed hypotheses under the outlined conditions and determined models which may assist or direct avenues of archaeological investigation. Therefore, the testing of this and other related models is the mandate which this study leaves with further researchers concerned with Alberta's ethnic vernacular architecture.

TABLE 1: Settled Population in Alberta by Ethnic Group, Date

Ethnic Group	Origins 1886	Birthplace 1886	Birthplace 1906	Birthplace 1911	Origins 1916
English	1,561	N/A	2	42,606	309,320
Irish	924		3	5,320	115,136
Scots	1,266		8	16,183	162,685
German	109	35	3,216	6,102	67,994
New Brunswick	N/A	87	N/A	N/A	N/A
Quebecois	N/A	467	N/A	N/A	N/A
Scandinavian	30	20	6,296	11,965	60,712
Ukrainian	N/A	N/A	11,041	8,977	14,542

after Canada (1886; 1907; 1913; 1915; 1918)

Note:

N/A Not Available: This information was not given.

Origins term undefined in the census, but is taken to mean the ethnic origins ascribed to by the population, not necessarily their birthplace (i.e. possibly their ancestral, or sentimental origins). This is differentiated from...

Birthplace which definitely refers to the country in which the population was born.

TABLE 2: A Sample of Lumber Dealers/Yards in Alberta Towns
Accessible to Study Area Based Upon Directory Listings

Town	1899	1911	1920
Alix	0	2	1
Bashaw	0	0	1
Blackie	0	1	2
Bruderheim	0	1	1
Calgary	2	9	4
Didsbury	0	1	2
Edmonton	2	18	20
Gleichen	1	1	1
Haynes	0	0	1
High River	0	1	1
Innisfail	1	0	0
Lamont	0	0	1
Leduc	1	0	1
Mirror	0	0	1
Mundare	0	0	1
Three Hills	0	1	2
Wetaskiwin	3	3	2
Vegreville	0	2	0

TABLE 3: A Sample of Brick Dealers/Yards in Alberta Towns
Accessible to Study Area Based Upon Directory Listings

Town	1899	1911	1920
Blairmore	0	1	0
Calgary	0	5	0
Edmonton	2	4	0
Elcan	0	0	1
Ft. Saskatchewan	0	1	0
Innisfail	0	1	0
Lacombe	0	1	0
Lethbridge	0	1	1
Medicine Hat	0	0	2
Okotoks	0	1	0
Red Cliff	0	0	3
Red Deer	0	1	1
Smoky Lake	0	1	1
St. Albert	0	2	0
Vegreville	0	2	0

after The Henderson Publishing Company (1899; 1911); Wrigley
Directory Limited (1920).

Note: inclusion in Directories required a fee; therefore, exclusion
may reflect non-payment of fee, not non-existence of business
at a given time.

TABLE 4: Frequencies of Attributes for Ethnic Groups

Attribute	State	ALL			BRITISH			FRENCH CANADIAN			GERMAN			SCANDINAVIAN			UKRAINIAN		
		frequency	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %
Date	1	6	100	5	0	0	0	4	66.7	17.4	1	16.7	3.8	1	16.7	3.7	0	0	0
	2	21	"	17.6	2	9.5	8	6	28.6	26.1	4	19	15.4	4	19	14.8	6	28.6	31.6
	3	55	"	46.2	14	25.5	56	11	20	47.8	10	18.2	38.5	11	20	40.7	9	16.4	47.4
	4	37	"	31.1	9	24.3	36	2	5.4	8.7	11	29.7	42.3	11	29.7	40.7	4	10.8	21.1
Prus	0	83	"	55	11	13.3	37	16	19.3	53	18	21.7	60	13	15.7	43	25	30.1	83
	1	67	"	45	19	28.4	63	14	20.9	47	12	17.9	40	17	25.4	57	5	7.5	17
Site	1	138	"	92	28	20.3	93	28	20.3	93	26	18.8	87	27	19.6	90	29	21	97
	2	12	"	8	2	16.7	7	2	16.7	7	4	33.3	13	3	25	10	1	8.3	3
Hall	0	107	"	78.1	14	13.1	51.9	23	21.5	82.1	22	20.6	88	19	17.8	67.9	29	27.1	100
	1	30	"	21.9	13	43.3	48.1	5	16.7	17.9	3	10	12	9	30	32.1	0	0	0
Stor	1	40	"	26.7	6	15	20	7	17.5	23.3	6	15	20	6	15	20	15	37.5	50
	2	88	"	58.7	19	21.6	63.3	18	20.5	60	16	18.8	53.3	20	22.7	66.7	15	17	50
	3	15	"	10	2	13.3	6.7	4	26.7	13.3	6	40	20	3	20	10	0	0	0
	4	7	"	4.7	3	42.9	10	1	14.3	3.3	2	28.6	6.7	1	14.3	3.3	0	0	0
Plan	1	21	"	14	5	23.8	16.7	4	19	13.3	7	33.3	23.3	5	23.8	16.7	0	0	0
	2	76	"	50.7	14	18.4	46.7	14	18.4	46.7	14	18.4	46.7	9	11.8	30	25	32.9	83.3
	3	20	"	13.3	8	40	26.7	5	25	16.7	2	10	6.7	3	15	10	2	10	6.7
	4	20	"	13.3	0	0	0	3	15	10	6	30	20	8	40	26.7	3	15	10
	5	9	"	6	0	0	0	3	30	10	1	11.1	3.3	5	55.6	16.7	0	0	0
	6	3	"	2	2	66.7	6.7	1	33.3	3.3	0	0	0	0	0	0	0	0	0
	7	1	"	.7	1	100	.7	0	0	0	0	0	0	0	0	0	0	0	0
Exten	0	84	"	56	18	21.4	60	17	20.2	56.7	18	21.4	60	12	14.3	40	19	22.6	63.3
	1	3	"	2	0	0	0	0	0	0	1	33.3	3.3	2	66.7	6.7	0	0	0
	2	15	"	10	1	6.7	3.3	5	33.3	16.7	1	6.7	3.3	3	20	10	5	33.3	16.7
	3	11	"	7.3	2	18.2	6.7	2	18.2	6.7	3	27.3	10	1	9.1	3.3	3	27.3	10
	4	12	"	8	4	33.3	13.3	4	33.3	13.3	1	8.3	3.3	3	25	10	0	0	0
	5	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
	6	1	"	.7	0	0	0	0	0	0	1	100	3.3	0	0	0	0	0	0
	12	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
	14	3	"	2	0	0	0	0	0	0	1	33.3	3.3	2	66.7	6.7	0	0	0
	23	9	"	6	0	0	0	0	0	0	3	33.3	10	3	33.3	10	3	33.3	10
	24	6	"	4	3	50	10	1	16.7	3.3	1	16.7	3.3	1	16.7	3.3	0	0	0
	32	1	"	6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	34	2	"	1.3	0	0	0	1	50	3.3	0	0	0	1	50	3.3	0	0	0
	42	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bsar	0	33	"	23.2	1	3	3.7	14	42.4	51.9	6	18.2	20.7	5	15.2	16.7	7	21.2	24.1
	1	50	"	35.2	6	12	22.2	8	16	29.6	11	22	37.9	7	14	23.3	18	36	62.1
	2	41	"	28.9	13	31.7	48.1	4	9.8	14.8	6	14.6	20.7	15	36.6	50	3	7.3	10.3
	3	18	"	12.7	7	38.9	25.9	1	5.6	3.7	6	33.3	20.7	3	16.7	10	1	5.6	3.4
Found	1	36	"	25	2	5.6	7.1	15	41.7	53.6	5	13.9	16.7	5	13.9	16.7	9	25	32.1
	2	21	"	14.6	8	38.1	28.6	2	9.5	7.1	4	19	13.3	5	23.8	16.7	2	9.5	7.1
	3	37	"	25.7	4	10.8	14.3	4	10.8	14.3	8	21.6	26.7	6	16.2	20	15	40.5	53.6
	4	49	"	34	14	28.6	50	7	14.3	25	12	24.5	40	14	28.6	46.7	2	4.1	7.1
	5	1	"	.7	0	0	0	0	0	0	1	100	3.3	0	0	0	0	0	0
Exear	0	123	"	82	29	23.6	96.7	30	24.4	100	30	24.4	100	30	24.4	100	4	3.3	13.3
	1	16	"	10.7	0	0	0	0	0	0	0	0	0	0	0	0	16	100	53.3
	2	10	"	6.7	0	0	0	0	0	0	0	0	0	0	0	0	10	100	33.3
	4	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
Exwd	0	17	"	11.3	2	11.8	6.7	0	0	0	3	17.6	10	0	0	0	12	70.6	40
	1	2	"	1.3	0	0	0	1	50	3.3	0	0	0	1	50	3.3	0	0	0
	2	3	"	2	0	0	0	2	66.7	6.7	0	0	0	1	33.3	3.3	0	0	0
	3	76	"	50.7	17	22.4	56.7	16	21.1	53.3	22	28.9	73.3	18	23.7	60	3	3.9	10
	4	44	"	29.3	8	18.2	26.7	10	22.7	33.3	3	6.8	10	8	18.2	26.7	15	34.1	50
	5	5	"	3.3	2	40	6.7	0	0	0	2	40	6.7	1	20	3.3	0	0	0
	6	3	"	2	1	33.3	3.3	1	33.3	3.3	0	0	0	1	33.3	3.3	0	0	0

TABLE 4 continued

		ALL			BRITISH			FRENCH CANADIAN			GERMAN			SCANDINAVIAN			UKRAINIAN		
		f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %
Owin2	0	1	100	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.3
	1	99	"	66.7	15	15.2	50	23	23.2	79.3	18	18.2	60	22	22.2	73.3	21	21.2	70
	2	42	"	28.2	12	28.6	40	3	7.1	10.3	11	26.2	36.7	8	19	26.7	8	19	26.7
	3	5	"	3.4	2	40	6.7	3	60	10.3	0	0	0	0	0	0	0	0	0
Wside	4	2	"	1.3	1	50	3.3	0	0	0	1	50	3.3	0	0	0	0	0	0
	1	142	"	94.7	27	19	90	30	21.1	100	29	20.4	96.7	30	21.1	100	26	18.3	86.7
	2	8	"	5.3	3	37.5	10	0	0	0	1	12.5	3.3	0	0	0	4	50	13.3
	0	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.3
Owin3	1	140	"	94	27	19.3	90	29	20.7	100	29	20.7	96.7	30	21.4	100	25	17.9	83.3
	2	8	"	5.4	3	37.5	10	0	0	0	1	12.5	3.3	0	0	0	4	50	13.3
	0	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.3
	1	117	"	78	20	17.1	66.7	25	21.4	83.3	28	23.9	93.3	25	21.4	83.3	19	16.2	63.3
Wside	2	33	"	22	10	30.3	33.3	5	15.2	16.7	2	6.1	6.7	5	15.4	16.7	11	33.3	36.7
	0	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.3
	1	118	"	79.2	21	17.8	70	25	21.2	86.2	27	22.9	90	25	21.2	83.3	20	16.9	66.7
	2	30	"	20.1	9	30	30	4	13.3	13.8	3	10	10	5	16.7	16.7	9	30	30
Wside	1	149	"	99.3	29	19.5	96.7	30	20.1	100	30	20.1	100	30	20.1	100	30	20.1	100
	2	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
	0	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.3
	1	146	"	98	29	19.9	96.7	29	19.9	100	29	19.9	96.7	30	19.9	100	29	19.9	96.7
Wdiv	2	2	"	1.3	1	50	3.3	0	0	0	1	50	3.3	0	0	0	0	0	0
	1	11	"	8.2	2	18.2	6.7	2	18.2	8.3	3	27.3	11.5	0	0	0	4	33.4	16
	2	112	"	83.6	24	21.4	80	17	15.2	70.8	22	19.6	84.6	29	25.9	100	20	17.9	80
	3	8	"	6	3	37.5	10	3	37.5	12.5	1	12.5	3.8	0	0	0	1	12.5	4
Owin6	4	2	"	1.5	0	0	0	2	100	8.3	0	0	0	0	0	0	0	0	0
	5	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
	0	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.8
	1	5	"	3.7	0	0	0	0	0	0	1	20	3.8	0	0	0	4	80	15.4
Wswing	2	127	"	94.8	29	22.8	96.7	23	18.1	100	25	19.7	96.2	29	22.8	100	21	16.5	80.8
	5	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
	1	115	"	84.6	24	20.9	80	20	17.4	80	22	19.1	84.6	28	24.3	93.3	21	18.3	84
	2	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	4
Owin7	3	3	"	2.2	2	66.7	6.7	0	0	0	0	0	0	1	33.3	3.3	0	0	0
	4	17	"	12.5	4	23.5	13.3	5	29.4	20	4	23.5	15.4	1	5.9	3.3	3	17.9	12
	0	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.8
	1	124	"	91.2	28	22.6	93.3	22	17.7	91.7	24	19.4	92.3	29	23.4	96.7	21	16.9	80.8
Spwin	2	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.8
	3	3	"	2.2	2	66.7	6.7	0	0	0	0	0	0	1	33.3	3.3	0	0	0
	4	6	"	4.4	0	0	0	1	16.7	4.2	2	33.3	7.7	0	0	0	3	50	11.5
	5	1	"	4.4	0	0	0	1	100	4.2	0	0	0	0	0	0	0	0	0
Baywin	0	119	"	79.3	23	19.3	76.7	21	17.6	70	23	19.3	76.7	24	20.2	80	28	23.5	93.3
	1	18	"	12	4	22.2	13.3	7	38.9	23.3	2	11.1	6.7	4	22.2	13.3	1	5.6	3.3
	2	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
	3	3	"	2	0	0	0	1	33.3	3.3	1	33.3	3.3	1	33.3	3.3	0	0	0
Dormer	4	2	"	1.3	2	100	6.7	0	0	0	0	0	0	0	0	0	0	0	0
	0	136	"	90.7	24	17.6	80	30	22.1	100	28	20.6	93.3	24	17.6	80	30	22.1	100
	1	12	"	8	4	38.3	13.3	0	0	0	2	16.7	6.7	6	50	20	0	0	0
	2	2	"	1.3	2	100	6.7	0	0	0	0	0	0	0	0	0	0	0	0
Dormer	0	112	"	75.2	16	14.3	53.3	21	18.8	70	25	22.3	83.3	21	18.8	72.4	29	25.9	96.7
	2	15	"	10.1	7	46.7	23.3	3	20	10	2	13.3	6.7	2	13.3	6.7	1	6.7	3.3
	3	2	"	1.3	1	50	3.3	1	50	3.3	0	0	0	0	0	0	0	0	0
	4	1	"	.7	0	0	0	1	100	3.3	0	0	0	0	0	0	0	0	0
	5	4	"	2.7	2	50	6.7	1	25	3.3	1	25	3.3	0	0	0	0	0	0
	6	6	"	4	3	50	10.1	2	33.3	6.7	1	16.7	3.3	0	0	0	0	0	0
	7	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
	8	1	"	.7	0	0	0	0	0	0	1	100	3.3	0	0	0	0	0	0
	10	2	"	1.3	0	0	0	0	0	0	0	0	0	2	100	6.9	0	0	0
	11	2	"	1.3	0	0	0	0	0	0	0	0	0	2	100	6.9	0	0	0
	12	1	"	.7	0	0	0	1	100	3.3	0	0	0	0	0	0	0	0	0
	13	2	"	1.3	0	0	0	0	0	0	0	0	0	2	100	6.9	0	0	0

TABLE 4 continued

	ALL			BRITISH			FRENCH CANADIAN			GERMAN			SCANDINAVIAN			UKRAINIAN		
	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %
Dorloc	1	8	100	5.3	2	25	6.7	5	62.5	16.7	0	0	0	1	12.5	3.3	0	0
	2	84	"	56	18	21.4	60	13	15.5	43.3	18	21.4	60	19	22.6	63.3	16	19
	3	4	"	2.7	0	0	0	0	0	0	1	25	3.3	1	25	3.3	2	50
	4	10	"	6.7	5	50	16.7	1	10	3.3	1	10	3.3	2	20	6.7	1	10
	5	27	"	18	2	7.4	6.7	8	29.6	26.7	5	18.5	16.7	1	11.1	3.3	1	11.1
	6	9	"	6	1	11.1	3.3	1	11.1	3.3	5	55.6	16.7	1	11.1	3.3	1	11.1
	7	8	"	5.3	2	25	6.7	2	25	6.7	0	0	0	1	12.5	3.3	3	37.5
Odr1A	0	138	"	92	28	20.3	93.3	27	19.6	90	27	19.6	90	26	18.8	86.7	30	21.7
	11	2	"	1.3	0	0	0	2	100	6.7	0	0	0	0	0	0	0	0
	12	9	"	6	1	11.1	3.3	1	11.1	3.3	3	33.3	10	4	44.4	13.3	0	0
	15	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0
Odr1B	0	133	"	88.7	21	15.8	70	28	21.1	93.3	27	20.3	90	27	20.3	90	30	22.6
	3	1	"	.7	1	100	3.3	0	0	0	0	0	0	0	0	0	0	0
	4	2	"	1.3	0	0	0	0	0	0	1	50	3.3	1	50	3.3	0	0
	21	2	"	1.3	0	0	0	1	50	3.3	1	50	3.3	0	0	0	0	0
	22	6	"	4	4	66.7	13.3	0	0	0	1	16.7	3.3	1	16.7	3.3	0	0
	25	6	"	4	4	66.7	13.3	1	16.7	3.3	0	0	0	1	16.7	3.3	0	0
Odr1C	0	36	"	24.7	2	5.6	6.9	7	19.4	23.3	5	13.9	17.2	5	13.9	17.2	17	47.2
	1	6	"	4.1	1	16.7	3.4	2	33.3	6.7	2	33.3	6.9	1	16.7	3.4	0	0
	2	25	"	17.1	10	40	34.5	5	20	16.7	4	16	13.8	4	16	13.8	2	8
	3	5	"	3.4	1	20	3.4	2	40	6.7	0	0	0	2	40	6.9	0	0
	4	13	"	8.9	4	30.8	13.8	3	15.4	6.7	2	15.4	6.9	2	15.4	6.9	3	23.1
	5	24	"	16.4	1	4.2	3.4	6	25	20	7	29.2	24.1	4	16.7	13.8	6	25
	6	24	"	16.4	7	29.2	24.1	4	16.7	13.3	4	16.7	13.8	9	37.5	31	0	0
	14	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100
	22	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4
Doror	1	9	"	6.2	1	11.1	3.6	3	33.3	10	2	22.2	7.1	3	33.3	10	0	0
	2	65	"	44.5	13	20	46.4	7	10.8	23.3	7	10.8	25	13	20	43.3	25	38.5
	3	35	"	24	7	20	25	9	25.7	30	9	25.7	32.1	8	22.9	26.7	2	5.7
	4	18	"	12.3	4	22.2	14.3	2	11.1	6.7	6	33.3	21.4	4	22.2	13.3	2	11.1
	5	7	"	4.8	1	14.3	3.6	5	71.4	16.7	1	14.3	3.6	0	0	0	0	0
	6	1	"	.7	0	0	0	1	100	3.3	0	0	0	0	0	0	0	0
	7	9	"	6.2	2	22.2	7.1	2	22.2	6.7	3	33.3	10.7	1	11.1	3.3	1	11.1
	8	2	"	1.4	0	0	0	1	50	3.3	0	0	0	1	50	3.3	0	0
Dhead	1	108	"	74	19	17.6	63.3	23	21.3	79.3	20	18.5	71.4	22	20.4	75.9	24	22.2
	2	33	"	22.6	10	30.3	33.3	2	6.1	6.9	8	24.3	28.6	7	21.3	24.1	6	18.2
	3	3	"	2.1	1	33.3	3.3	2	66.7	6.9	0	0	0	0	0	0	0	0
	4	2	"	1.4	0	0	0	2	100	6.9	0	0	0	0	0	0	0	0
Odr2	0	27	"	19.1	0	0	0	5	18.5	17.2	5	18.5	17.9	4	14.8	14.8	13	48.1
	1	83	"	58.9	18	21.7	62.1	19	22.9	65.5	17	20.5	60.7	17	20.5	60	12	44.5
	2	28	"	19.9	11	39.3	37.9	2	7.1	6.9	6	21.4	21.4	6	21.4	22.2	3	10.7
	3	1	"	.7	0	0	0	1	100	3.4	0	0	0	0	0	0	0	0
	4	2	"	1.4	0	0	0	2	100	6.9	0	0	0	0	0	0	0	0
Dside	1	134	"	91.8	26	19.4	86.7	29	21.6	100	27	20.1	96.4	27	20.1	93.1	25	18.7
	2	12	"	8.2	4	33.3	13.3	0	0	0	1	8.3	3.6	2	16.7	6.9	5	41.7
Odr3	0	27	"	19.1	0	0	0	5	18.5	17.2	5	18.5	17.9	4	14.8	14.8	13	48.1
	1	106	"	75.2	25	23.6	86.2	24	22.6	82.8	22	20.8	78.6	22	20.8	81.5	13	12.3
	2	8	"	5.7	4	50	13.8	0	0	0	1	12.5	3.6	1	12.5	3.7	2	25
Dtype	11	2	"	1.8	0	0	0	1	50	4	0	0	0	1	50	4.3	0	0
	12	6	"	5.5	0	0	0	3	50	12	1	16.7	5.3	1	16.7	4.3	0	0
	21	2	"	1.8	1	50	4	0	0	0	0	0	0	1	50	4.3	0	0
	31	5	"	4.6	2	40	8	2	40	8	0	0	0	1	20	4.3	0	0
	34	4	"	3.7	2	50	8	1	25	4	0	0	0	1	25	4.3	0	0
	41	16	"	14.7	7	43.8	28	0	0	0	2	1.7	10.5	7	43.8	30.4	0	0
	44	10	"	9.2	0	0	0	5	50	20	3	30	15.8	0	0	0	2	20
	45	31	"	28.4	6	19.4	24	7	22.6	28	6	19.4	31.6	3	9.7	13	9	29
	51	7	"	6.4	1	14.3	4	2	28.6	8	2	28.6	10.5	1	14.3	4.3	1	14.3
	53	8	"	7.3	2	25	8	2	25	8	1	12.5	5.3	1	12.5	4.3	2	25

TABLE 4 continued

		ALL			BRITISH			FRENCH CANADIAN			GERMAN			SCANDINAVIAN			UKRAINIAN		
		f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %
Dtype 61	3	100	2.8		1	33.3	4	0	0	0	1	33.3	5.3	1	33.3	4.3	0	0	0
con't 64	3	"	2.8		0	0	0	1	33.3	4	0	0	0	2	66.7	8.7	0	0	0
others	12	"	10.8		3	25	12	1	8.3	4	3	25	15.8	3	25	13	2	16.7	11.8
Cdr6A	0	149	"	99.3	30	20.1	100	30	20.1	100	29	19.5	96.7	30	20.1	100	30	20.1	100
12	1	"			0	0	0	0	0	0	1	100	3.3	0	0	0	0	0	0
Odr6B	0	143	"	97.3	29	20.3	96.7	29	20.3	96.7	26	18.2	92.9	29	20.3	100	30	21	100
12	1	"	.7		0	0	0	0	0	0	1	100	3.6	0	0	0	0	0	0
45	2	"	1.4		0	0	0	1	50	3.3	1	50	3.6	0	0	0	0	0	0
53	1	"	.7		1	100	3.3	0	0	0	0	0	0	0	0	0	0	0	0
Odr6C	0	126	"	90.6	22	17.5	84.6	24	19	88.6	24	19	85.7	26	20.6	89.7	29	23	100
12	2	"	1.4		1	50	3.8	1	50	3.7	0	0	0	0	0	0	0	0	0
45	5	"	3.6		2	40	7.7	0	0	0	2	40	7.1	1	20	3.4	0	0	0
51	3	"	2.2		0	0	0	1	33.3	3.7	1	33.5	3.6	1	33.3	3.4	0	0	0
others	3	"	2.1		1	33.3	3.8	1	33.3	3.7	0	0	0	1	33.3	3.4	0	0	0
Odr6D	0	28	"	28.6	0	0	0	6	21.4	27.3	5	17.6	31.3	4	14.3	20.0	13	46.4	56.5
12	2	"	2.0		1	50	5.9	0	0	0	0	0	0	1	50	5.0	0	0	0
21	3	"	3.1		0	0	0	1	33.3	4.5	1	33.3	6.3	1	33.3	5.0	0	0	0
41	6	"	6.1		0	0	0	1	16.7	4.5	0	0	0	4	66.7	20.0	1	16.7	4.3
45	25	"	25.5		10	40	58.8	4	16	18.2	4	16	25	2	8	10.0	5	20	21.7
51	10	"	10.2		2	20	11.8	2	20	9.1	1	10	6.3	4	40	20.0	1	100	4.3
53	8	"	8.2		2	25	11.8	2	25	9.1	1	12.5	6.3	2	25	10.0	1	12.5	4.3
44	4	"	4.1		0	0	0	4	100	18.2	0	0	0	0	0	0	0	0	0
61	2	"	2		0	0	0	0	0	0	1	50	6.3	1	50	5	0	0	0
others	10	"	10		2	20	11.8	2	20	9.1	3	30	18.9	1	10	5	2	20	8.6
Darpan	1	32	"	29.4	9	28.1	36	5	15.6	20	6	18.8	31.6	8	25	34.8	4	12.5	23.5
2	70	"	64.2		16	22.9	64	16	22.9	64	12	17.1	63.2	14	20	60.9	12	17.1	70.6
3	7	"	6.4		0	0	0	4	57.1	16	1	14.3	5.3	1	14.3	4.3	1	14.3	5.9
Odr7	0	28	"	27.7	0	0	0	6	21.4	26.1	3	10.7	31.5	4	14.3	18.2	13	46.4	56.5
1	26	"	25.8		6	23.1	35.3	4	15.4	17.4	4	15.4	25	9	34.6	40.9	3	11.5	13
2	45	"	44.6		13	28.9	56.5	7	15.6	43.8	7	15.6	43.8	8	17	36.3	7	15.6	30.4
3	2	"	2		1	50	5.9	0	0	0	0	0	0	1	50	4.5	0	0	0
Dglaz	0	60	"	55	9	15	36	14	23.3	56	12	20	63.2	10	16.7	43.5	15	25	88.2
1	48	"	44		16	33.3	64	11	22.9	44	6	12.5	31.6	13	27.1	56.5	2	4.2	11.8
Cdr8	0	77	"	77	13	16.9	76.5	13	16.2	59.1	12	15.6	75	18	23.4	81.8	21	27.3	91.3
1	22	"	22		4	18.2	23.5	9	40.9	40.9	3	13.6	18.8	4	18.2	18.2	2	9.1	8.7
Strloc	0	70	"	47.3	8	11.4	26.7	16	22.9	53.3	13	18.6	44.8	9	12.9	31	24	34.3	80
1	74	"	50		22	29.7	73.3	11	14.9	36.7	16	21.6	55.2	19	25.7	65.5	6	8.2	20
2	2	"	1.4		0	0	0	1	50	3.3	0	0	0	1	50	3.4	0	0	0
others	2	"	1.4		0	0	0	2	100	6.6	0	0	0	0	0	0	0	0	0
Ostr1	0	105	"	71.4	17	16.2	56.7	22	21	75.9	23	21.9	79.3	15	14.3	51.7	28	26.7	93.3
1	40	"	27.2		12	30	40	6	15	20.7	6	15	20.7	14	35	48.3	2	5	6.7
2	2	"	1.4		1	50	3.3	1	50	3.4	0	0	0	0	0	0	0	0	0
Stshp	0	70	"	47.3	8	11.4	26.7	16	22.9	53.3	13	18.6	44.8	9	12.9	31	24	34.3	80
1	71	"	48		21	29.6	70	12	16.9	40	16	22.5	55.2	16	22.5	55.2	6	8.5	20
2	6	"	4.1		1	16.7	3.3	2	33.3	6.7	0	0	0	3	50	10.3	0	0	0
3	1	"	.7		0	0	0	0	0	0	0	0	0	1	100	3.4	0	0	0
Ostr2	0	105	"	71.4	17	16.2	56.7	22	21	75.9	23	21.9	79.3	15	14.3	51.7	28	26.7	93.3
1	41	"	27.9		13	31.7	43.3	7	17.1	24.1	5	12.2	17.2	14	34.1	48.3	2	4.9	6.7
2	1	"	.7		0	0	0	0	0	0	1	100	3.4	0	0	0	0	0	0
Intstr	0	35	"	25.9	5	14.3	19.2	7	20	25	7	20	28	6	17.1	20.7	10	28.6	37
1	36	"	26.7		11	30.6	42.3	4	11.1	14.3	5	13.9	20	11	30.6	37.9	5	13.9	18.5
2	23	"	17		3	13	11.5	5	21.7	17.9	4	17.4	16	4	17.4	13.8	7	30.4	25.9
3	12	"	8.9		0	0	0	3	25	10.7	2	16.7	8	2	16.7	6.9	5	41.7	18.5
4	14	"	10.4		5	35.7	19.2	4	28.6	14.3	4	28.6	16	1	7.1	3.4	0	0	0
5	4	"	3		0	0	0	1	25	3.6	1	25	4	2	50	6.9	0	0	0
6	6	"	4.4		2	33.3	7.7	2	33.3	7.1	2	33.3	8	0	0	0	0	0	0
7	2	"	1.5		0	0	0	0	0	0	0	0	0	2	100	6.9	0	0	0
8	3	"	2.2		0	0	0	2	66.7	7.1	0	0	0	1	33.3	3.4	0	0	0

TABLE 4 continued

		ALL				BRITISH				FRENCH CANADIAN				GERMAN				SCANDINAVIAN				UKRAINIAN			
		f	row %	column %	%	f	row %	column %	%	f	row %	column %	%	f	row %	column %	%	f	row %	column %	%	f	row %	column %	%
Porgal	0	54	100	36.2	7	13	23.3	12	22.2	40	9	16.7	31	9	16.7	30	17	31.5	56.7	1	11.1	3.3	0	0	0
	1	9	"	6	2	22.2	6.7	5	55.6	16.7	0	0	0	1	11.1	3.3	1	11.1	3.3	0	0	0	0	0	
	2	5	"	3.4	2	40	6.7	1	20	3.3	0	0	0	2	40	6.7	0	0	0	0	0	0	0	0	
	3	24	"	16.1	8	33.3	26.7	3	12.5	10	5	20.8	17.2	5	20.8	16.7	3	12.5	10	0	0	0	0	0	
	4	50	"	33.6	11	22	36.7	7	14	23.3	12	24	41.4	11	22	36.7	9	18	30	0	0	0	0	0	
Opch	0	7	"	4.7	0	0	0	2	28.6	6.7	3	42.9	10.3	2	28.6	6.7	0	0	0	0	0	0	0	0	
	1	106	"	71.1	21	19.8	70	25	23.6	83.3	18	17	62.1	17	16	56.7	25	23.6	83.3	0	0	0	0	0	
	2	4	"	2.7	1	25	3.3	2	50	6.7	1	25	3.4	0	0	0	0	0	0	0	0	0	0	0	
	3	2	"	1.3	0	0	0	0	0	0	0	0	0	2	100	6.7	0	0	0	0	0	0	0		
	4	34	"	22.8	8	23.5	26.7	3	8.8	10	8	23.5	27.6	11	32.4	36.7	4	11.8	13.3	1	33.3	3.3	0	0	
Pchsup	0	61	"	41.2	9	14.8	30	16	26.2	55.2	9	14.8	31	10	16.4	33.3	17	27.9	56.7	0	0	0	0	0	
	1	52	"	35.1	11	21.2	36.7	7	13.5	24.1	11	21.2	37.9	13	25	43.3	10	19.2	33.3	0	0	0	0	0	
	2	2	"	1.4	0	0	0	1	50	3.4	1	50	3.4	0	0	0	0	0	0	0	0	0	0	0	
	3	2	"	1.4	2	100	6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	4	29	"	19.6	8	27.6	26.7	5	17.2	17.2	7	24.1	24.1	6	20.7	20	3	10.3	10	0	0	0	0	0	
Opch2	0	2	"	1.4	0	0	0	0	0	0	1	50	3.4	1	50	3.3	0	0	0	0	0	0	0	0	
	1	109	"	73.2	22	20.2	73.3	27	24.8	90	18	16.5	62.1	17	15.6	56.7	25	22.9	83.3	0	0	0	0	0	
	2	2	"	1.3	0	0	0	0	0	0	0	0	0	2	100	6.7	0	0	0	0	0	0	0		
	3	37	"	24.8	8	21.6	26.7	3	8.1	10	10	27	34.5	11	29.7	36.7	5	13.5	16.7	0	0	0	0	0	
	4	1	"	.7	0	0	0	0	0	0	1	100	3.4	0	0	0	0	0	0	0	0	0	0	0	
Pchloc	0	54	"	36.2	7	13	23.3	12	22.2	40	9	16.7	31	9	16.7	30	17	31.5	56.7	0	0	0	0	0	
	1	67	"	45	14	20.9	46.7	11	16.4	36.7	17	25.4	58.6	15	22.4	50	10	14.9	33.3	0	0	0	0	0	
	2	5	"	3.4	0	0	0	2	40	6.7	1	20	3.4	2	40	6.7	0	0	0	0	0	0	0	0	
	3	10	"	6.7	4	40	13.3	2	20	6.7	1	10	3.4	2	20	6.7	1	10	3.3	0	0	0	0	0	
	4	13	"	8.7	5	38.5	16.7	3	23.1	10	1	7.7	3.4	2	15.4	6.7	2	15.4	6.7	0	0	0	0	0	
Opch3	0	106	"	71.1	21	19.8	70	25	23.6	83.3	18	17	62.1	17	16	56.7	25	23.6	83.3	0	0	0	0	0	
	1	5	"	3.4	1	20	3.3	0	0	0	2	40	6.9	1	20	3.3	1	20	3.3	0	0	0	0	0	
	2	17	"	11.4	6	35.3	20	2	11.8	6.7	5	29.4	17.2	4	23.5	13.3	0	0	0	0	0	0	0	0	
	3	21	"	14.1	2	9.5	6.7	3	14.3	10	4	19	13.8	8	38.1	26.7	4	19	13.3	0	0	0	0	0	
	4	54	"	36.5	7	13	24.1	12	22.2	40	9	16.7	31	9	16.7	30	17	31.5	56.7	0	0	0	0	0	
Pgsupm	0	64	"	43.2	15	23.4	51.7	14	21.9	46.7	14	21.9	48.3	14	21.9	46.7	7	10.9	23.3	0	0	0	0	0	
	1	6	"	4.1	1	16.7	3.4	0	0	0	0	0	0	1	16.7	3.3	4	66.7	13.3	0	0	0	0	0	
	2	22	"	14.9	6	27.3	20.7	4	18.2	13.3	6	27.3	20.7	5	22.7	16.7	1	4.5	3.3	0	0	0	0	0	
	3	1	"	.7	0	0	0	0	0	0	0	0	0	0	0	0	1	100	3.3	0	0	0	0	0	
	4	106	"	71.1	21	19.8	70	25	23.6	83.3	18	17	62.1	17	16	56.7	25	23.6	83.3	0	0	0	0	0	
Opch4	0	29	"	19.5	4	13.8	13.3	4	13.8	13.3	7	24.1	24.1	10	34.5	33.3	4	13.8	13.3	0	0	0	0	0	
	1	2	"	1.3	1	50	3.3	0	0	0	0	0	0	0	0	0	1	50	3.3	0	0	0	0	0	
	2	12	"	8.1	4	33.3	13.3	1	8.3	3.3	4	33.3	13.8	3	25	10	0	0	0	0	0	0	0	0	
	3	126	"	86.3	15	11.9	55.6	28	22.2	93.3	28	22.2	93.3	26	20.6	86.7	29	23	100	0	0	0	0	0	
	4	11	"	7.5	5	45.5	18.5	1	9.1	3.3	2	18.2	6.7	3	27.3	10	0	0	0	0	0	0	0	0	
Heat	0	4	"	2.7	2	50	7.4	1	25	3.3	0	0	0	1	25	3.3	0	0	0	0	0	0	0	0	
	1	3	"	2.1	3	100	11.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2	2	"	1.4	2	100	7.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	3	137	"	94.5	24	64.9	85.7	25	18.2	89.3	30	21.9	100	28	20.4	96.6	30	21.9	100	0	0	0	0	0	
	4	4	"	2.8	1	25	3.6	2	50	7.1	0	0	0	1	25	3.4	0	0	0	0	0	0	0	0	
Plumb	0	1	"	.7	1	100	3.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	3	"	2.1	2	66.7	7.1	1	33.3	3.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2	137	"	94.5	24	64.9	85.7	25	18.2	89.3	30	21.9	100	28	20.4	96.6	30	21.9	100	0	0	0	0	0	
	3	4	"	2.8	1	25	3.6	2	50	7.1	0	0	0	1	25	3.4	0	0	0	0	0	0	0	0	
	4	1	"	.7	1	100	3.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Frxout	1	33	"	24.8	5	15.2	20.8	8	24.2	28.6	7	21.2	25	4	12.1	16	9	27.3	37.1	0	0	0	0	0	
	2	91	"	68.4	13	14.3	54.2	18	19.8	64.3	21	23.1	75	20	22	80	19	20.9	67.9	0	0	0	0	0	
	3	9	"	6.8	6	66.7	25	2	22.2	7.1	0	0	0	1	11.1	4	0	0	0	0	0	0	0	0	
	4	37	"	29.1	2	5.4	8.7	5	13.5	18.5	7	18.9	25.9	6	16.2	24	17	45.9	68	0	0	0	0	0	
	5	18	"	14.2	3	16.7	13	3	16.7	11.1	5	27.8	18.5	4	22.2	16	3	16.7	12	0	0	0	0	0	
Layout	0	5	"	3.9	1	20	4.3	1	20	3.7	2	40	7.4	1	20	4	0	0	0	0	0	0	0	0	
	1	1	"	.8	0	0	0	0	0	0	0	0	0	0	0	0	1	100	4	0	0	0	0	0	
	2	3	"	2.4	0	0	0	2	66.7	7.4	0	0	0	1	33.3	4	0	0	0	0	0	0	0	0	
	3	4	"	3.1	1	25	4.3	1	25	3.7	1	25	3.7	1	25	4	0	0	0	0	0	0	0	0	
	4	1	"	.8	0	0	0	0	0	0	0	0	0	0	0	0	1	100	4	0	0	0	0	0	

TABLE 4 continued

		ALL			BRITISH			FRENCH CANADIAN			GERMAN			SCANDINAVIAN			UKRAINIAN		
		f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %
Layout con't	8	1	100	.8	1	100	4.3	0	0	0	0	0	0	0	0	0	0	0	0
	10	1	"	.8	1	100	4.3	0	0	0	0	0	0	0	0	0	0	0	0
	11	52	"	40.9	12	23.1	52.2	14	26.9	51.9	12	23.1	44.4	11	21.2	44	3	5.8	12
	12	4	"	3.1	2	50	8.7	1	25	3.7	0	0	0	1	25	4	0	0	0
Fence	0	101	"	74.3	18	17.8	69.2	21	20.8	75	20	19.8	71.4	18	17.8	72	24	23.8	82.8
	1	35	"	25.7	8	22.9	30.8	7	20	25	8	22.9	28.6	7	20	28	5	14.3	17.2
Shrub	0	24	"	16.6	2	8.3	7.1	7	29.2	23.3	5	20.8	17.9	5	20.8	17.2	5	20.8	16.7
	1	121	"	83.4	26	21.5	92.9	23	19	76.7	23	19	82.1	24	19.8	82.8	25	20.7	83.3
INTERVAL DATA		f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %	f	row %	column %
Length																			
4-4.99	20	"	15		19	5	3	2	10	6	6	30	20	1	5	3	10	50	31
5-5.99	19	"	16		2	10.5	6	4	21.1	12	4	21.1	12	2	10.5	6	7	36.8	22
6-6.99	13	"	11		2	15.4	6	2	15.4	6	2	15.4	6	4	30.8	12	3	23.1	9
7-7.99	21	"	16		7	33.3	23	4	19	12	4	19	12	4	19	12	4	19	12
8-8.99	22	"	19		3	13.6	9	4	18.2	12	6	27.3	19	5	22.7	15	4	18.2	13
9-9.99	19	"	14		5	26.3	15	6	31.6	19	3	15.8	9	4	21.1	12	1	5.3	3
10-10.99	13	"	10		3	23.1	9	2	15.4	6	2	15.4	6	5	38.5	16	1	7.7	3
≥ 11	22	"	19		7	31.8	21	6	27.3	18	3	13.6	9	5	22.7	15	0	0	0
Width																			
4-4.99	1	"	1		0	0	0	0	0	0	0	0	0	0	0	0	1	100	3
5-5.99	3	"	3		1	33.3	3	2	66.7	6	0	0	0	0	0	0	0	0	0
6-6.99	15	"	12		1	6.7	3	5	33.3	17	3	20	9	2	13.3	6	4	26.7	13
7-7.99	24	"	17		8	33.3	26	6	25	19	2	8.3	6	5	20.8	15	3	12.5	9
8-8.99	41	"	29		5	12.2	16	4	9.8	13	13	31.7	41	11	26.8	33	8	19.5	26
9-9.99	29	"	25		6	20.7	20	1	3.4	3	4	13.8	12	9	31	28	9	31	27
10-10.99	16	"	15		4	25	13	4	25	12	4	25	12	2	12.5	6	2	12.5	6
≥ 11	21	"	20		5	23.8	15	8	38.1	24	4	19	12	1	4.8	3	3	14.3	9
Ratio																			
0-.49	1	"	1		0	0	0	0	0	0	0	0	0	1	100	3	0	0	0
50-.74	21	"	16		5	23.8	15	8	38.1	25	3	14.3	9	3	14.3	9	2	9.5	6
75-.99	32	"	22		13	40.6	42	5	15.6	15	2	6.3	6	9	28.1	27	3	9.4	9
1.0-1.24	33	"	23		4	12.1	13	5	15.2	15	10	30.3	32	9	27.3	27	4	12.1	12
1.25-1.49	21	"	15		5	23.8	15	4	19	13	7	33.3	22	4	19	13	3	14.3	9
1.50-1.74	16	"	17		2	12.5	6	3	18.8	9	2	12.5	4	4	25	12	5	31.3	15
1.75-1.99	21	"	16		0	0	0	5	23.8	15	5	23.8	15	0	0	0	11	52.4	36
≥ 2.0	5	"	5		1	20	3	1	20	3	1	20	3	0	0	0	2	40	6
Fthk																			
0-14	2	"	1.4		0	0	0	0	0	0	0	0	0	1	50	3.6	1	50	3.6
15-29	78	"	54.9		10	12.8	34	19	24.4	73.1	18	23.1	59	15	19.2	53.6	15	19.2	53.6
30-44	49	"	34.5		13	26.5	43	4	8.2	15.4	10	20.4	33	11	22.4	39.3	11	22.4	39.3
≥ 45	13	"	9.2		6	46.2	20	3	23.1	11.5	2	15.4	7	1	7.7	3.6	1	7.7	3.6
Mthk																			
≤ 14	21	"	14		10	47.6	33	0	0	0	6	28.6	20	4	19	13	1	4.8	3
15-19	84	"	56		15	17.9	50	16	19.1	53	19	22.6	63	21	25	70	13	15	43
20-24	37	"	25		5	13.5	16	9	24.3	30	4	10.8	13	3	8.1	9	14	37.8	54
25-29	3	"	2		0	0	0	1	33.3	3	0	0	0	2	66.7	6	0	0	0
≥ 30	5	"	5		0	0	0	4	80	12	1	20	3	0	0	0	0	0	0
Rmtot																			
0-1	2	"	1		0	0	0	1	50	3	1	50	3	0	0	0	0	0	0
2-3	33	"	22		2	6.1	7	5	15.2	17	4	12.1	13	2	6.1	6	20	60.6	67
4-5	40	"	27		7	17.5	23	7	17.5	24	9	22.5	30	9	22.5	30	8	20	37
6-7	41	"	27		13	31.7	44	9	22	30	9	22	30	8	19.5	27	2	4.9	7
8-9	24	"	16		4	16.7	13	8	33.3	27	6	25	20	6	25	20	0	0	0
≥ 10	10	"	7		4	40	13	0	0	0	1	10	3	5	50	16	0	0	0

TABLE 4 continued

		ALL			BRITISH			FRENCH CANADIAN			GERMAN			SCANDINAVIAN			UKRAINIAN		
		row	column		row	column		row	column		row	column		row	column		row	column	
		f	%	%	f	%	%	f	%	%	f	%	%	f	%	%	f	%	%
Rm1	1	5	100	3	0	0	0	3	60	10	2	40	-7	0	0	0	0	0	0
	2	43	"	29	3	7	10	5	11.6	17	9	20.9	30	3	7	10	23	53.5	97
	3	37	"	25	7	18.9	23	8	21.6	27	6	16.2	20	9	24.3	30	7	18.9	23
	4	43	"	29	9	20.9	30	10	23.3	33	11	25.6	37	13	30.2	43	0	0	0
	5	14	"	9	8	57.1	27	3	21.4	10	0	0	0	3	21.4	10	0	0	0
	6	7	"	5	3	42.9	10	1	14.3	3	2	28.6	7	1	14.3	3	0	0	0
	7	1	"	1	0	0	0	0	0	0	0	0	0	1	100	3	0	0	0
	8	1	"	1	0	0	0	0	0	0	0	0	0	1	100	3	0	0	0
Rm2	1	35	"	27	4	11.4	15	5	14.3	20	4	11.4	15	4	11.4	14	18	51.4	67
	2	38	"	29	8	21.1	31	6	15.8	24	8	21.1	31	9	23.7	32	7	18.4	26
	3	19	"	14	4	21.1	15	3	15.8	12	4	21.1	15	6	31.6	21	2	10.5	7
	4	25	"	19	6	24	23	9	36	36	8	32	31	2	8	7	0	0	0
	5	10	"	8	2	20	8	2	20	8	2	20	8	4	40	14	0	0	0
	6	5	"	4	2	40	8	0	0	0	0	0	0	3	60	11	0	0	0
Chno	0	1	"	1	0	0	0	1	100	3	0	0	0	0	0	0	0	0	0
	1	121	"	82	21	17.4	72	23	19	77	27	22.3	90	22	18.2	73	28	23.1	97
	2	25	"	17	7	28	24	6	25	20	3	12	10	8	32	27	1	4	3
	3	1	"	1	1	100	3	0	0	0	0	0	0	0	0	0	0	0	0
Panel	1	33	"	25	9	27.3	30	5	15.2	22	5	15.2	19	11	33.3	38	3	9.1	12
	2	81	"	61	18	22.2	60	14	17.3	61	16	19.8	62	16	19.8	55	17	21	68
	3	5	"	4	1	20	3	1	20	4	2	40	8	1	20	3	0	0	0
	4	5	"	4	0	0	0	1	20	4	2	40	8	0	0	0	2	40	8
	5	9	"	7	2	22.2	6	2	22.2	8	1	11.1	4	1	11.1	3	3	33.3	12
Panc2	0	13	"	9.7	3	23.1	10	3	23.1	13.6	4	30.8	13.8	0	0	0	4	30.8	16
	1	38	"	28.4	10	26.3	33.3	4	10.5	18.2	8	21.1	27.6	12	31.6	41	4	10.5	16
	2	81	"	60.4	17	21	56.7	14	17.3	63.6	17	21	58.6	16	19.8	55	17	21	68
	3	2	"	1.5	0	0	0	1	50	4.5	0	0	0	1	50	3	0	0	0
Jpanel	1	32	"	24	8	25	27	5	15.6	21	4	12.5	15	12	37.5	41	3	9.4	12
	2	87	"	65	20	23	67	16	18.4	67	18	20.7	69	16	18.4	55	17	19.5	68
	3	5	"	4	1	20	3	0	0	0	3	60	12	1	20	3	0	0	0
	4	5	"	4	0	0	0	2	40	8	1	20	4	0	0	0	2	40	8
	5	5	"	4	1	20	3	1	20	4	0	0	0	0	0	0	3	60	12
Jpane2	0	8	"	6	0	0	0	3	37.5	12.5	1	12.5	3.8	0	0	0	4	50	16
	1	38	"	28.4	11	28.9	37	4	10.5	16.7	6	15.8	23.1	13	34.2	45	4	10.5	16
	2	87	"	64.9	19	21.8	63	16	18.4	66.7	19	21.8	73.1	16	18.4	55	17	19.5	68
	3	1	"	.7	0	0	0	1	100	3.4	0	0	0	0	0	0	0	0	0
	4	1	"	1	1	100	3	0	0	0	0	0	0	0	0	0	0	0	0
Nowin	0-4	16	"	12	1	6.3	3	3	18.8	10	2	12.5	6	4	25	14	6	37.5	20
	5-9	62	"	41	10	16.1	33	13	21	44	12	19.4	41	9	14.5	30	18	29	59
	10-14	38	"	25	10	26.3	32	10	26.3	33	6	15.8	20	6	15.8	20	6	15.8	20
	15-19	27	"	19	6	22.2	20	4	14.8	13	6	22.2	30	8	29.6	26	0	0	0
	20-24	3	"	2	1	33.3	3	0	0	0	0	0	0	2	66.7	7	0	0	0
	25-29	1	"	1	1	100	3	0	0	0	0	0	0	0	0	0	0	0	0
	30	1	"	1	1	100	3	0	0	0	0	0	0	0	0	0	0	0	0
	30	1	"	1	1	100	3	0	0	0	0	0	0	0	0	0	0	0	0
Totwin	0-4	15	"	11	0	0	0	3	20	10	2	13.3	6	4	26.7	14	6	40	20
	5-9	62	"	42	11	17.7	37	12	19.4	41	12	19.4	41	9	14.5	30	18	29	59
	10-14	32	"	21	9	28.1	29	9	28.1	29	4	12.5	13	4	12.5	13	6	18.8	20
	15-19	24	"	15	5	20.8	17	3	12.5	9	10	41.7	34	7	29.2	24	0	0	0
	20-24	8	"	5	2	25	6	3	37.5	9	1	12.5	3	2	25	6	0	0	0
	25-29	3	"	3	1	33.3	3	0	0	0	0	0	0	2	66.7	6	0	0	0
	30	4	"	4	1	25	3	0	0	0	1	25	3	1	25	3	0	0	0
	30	4	"	4	1	25	3	0	0	0	1	25	3	1	25	3	0	0	0
Dorno	1	30	"	20	0	0	0	6	20	20	5	16.7	17	4	13.3	13	15	50	50
	2	86	"	58	19	22.1	63	17	19.8	57	18	20.9	62	18	20.9	60	14	16.3	47
	3	24	"	16	9	37.5	30	6	25	20	1	4.2	3	7	29.2	23	1	4.2	3
	4	7	"	5	2	28.6	7	1	14.3	3	3	42.9	10	1	14.3	3	0	0	0
	5	1	"	1	0	0	0	0	0	0	1	100	3	0	0	0	0	0	0
	6	1	"	1	0	0	0	0	0	0	1	100	3	0	0	0	0	0	0

(See Table 5 for attribute label code and Figure 3 for Attribute State Description)

TABLE 5: Definition of Coded Attribute Labels

DATE	Date	PANEL	Number of panes in upper/ left sash
PRUS	Present use	PANE2	Number of panes in lower/ right sash
SITE	Site	NOWIN	Number of windows in main structure
HALL	Hall	TOTWIN	Total number of windows
STOR	Storeys	DORNO	Number of doors
PLAN	Plan	WHEAD	Window head
EXTEN	Extensions Note: this area refers to extensions to the structure, as opposed to "Wings" as used in the CIHB	WSIDE	Window sides
BSAR	Basement area	WSILL	Window sills
FOUND	Foundation material	WSILM	Window sill material
EXEAR	Exterior wall materials - earth	WDIV	Window divisions
EXWD	Exterior wall material - wood	SPWIN	Special windows
CJT	Corner joint type	DORMER	Dormer shape
BRICK	Brick	DORLOC	Door location
COMTI	Composition or tiles	ODR	Other door Note: the same reasoning applies as for OWIN
WALCON	Wall construction	DOROR	Door orientation
SHEA	Sheathing Note: this term refers to an exterior cladding applied to the building, rather than the meaning given to it by the CIHB	DHEAD	Door head
EXWAM	Additional wall material	DSIDE	Door sides
SHOF	Sheathing; other facades	DTYPE	Door type
WADD	Wall design and detail	DARPAN	Door/architrave panels
INTWAM	Interior wall material	DGLAZ	Door glazing
RFSHP	Roof shape	STRLOC	Stair location
CHLOCS	Chimney location side to side	OSTR	Other stair Note: the same reasoning applies as for OWIN
CHLOCF	Chimney location front to back	STSHP	Stair shape
MCHLOC	Multiple chimney location	INTSTR	Interior stair location
CHMAT	Chimney material	PORGAL	Porch/Gallery
RFEAV	Roof trim eaves	OPCH	Other porch Note: the same reasoning applies as for OWIN
RFRK	Roof trim raking	PCHSUP	Porch support
RFTRSF	Roof trim special features	PCHLOC	Porch location
WLOC	Window location	PGSUPM	Porch/Gallery support materials
WOPSH	Window opening shape	HEAT	Heating
OWIN	Other window Note: this term refers to the variable preceding it, applied to other windows on the structure than the main one	PLUMB	Plumbing
WSWING	Window swing	PRXOUT	Proximity to outbuildings
BAYWIN	Bay windows	LAYOUT	Layout of farm
		FENCE	Fence
		SHRUB	Shrubbery, Ornamental trees
		LENGTH	Length of building
		WIDTH	Width of building
		RATIO	Ratio of width to length
		FTHK	Foundation of thickness
		MTHK	Main wall thickness
		RMTOT	Total number of rooms
		RM1	Number of rooms Main Floor
		RM2	Number of rooms Upper Floor
		CHNO	Chimney number

TABLE 6: χ^2 Values per Attribute with Ethnic Group, Date,
Town Independent

Attribute	Ethnic Group			χ^2	Date			χ^2	Town		
	χ^2	CV	df		CV	df	χ^2		CV	df	
Hall	22.47	21.03	4	NMS				NMS			
Stor	NMS			NMS				NMS			
Plan	NMS			NMS				NMS			
Exten	NMS			NMS				NMS			
C*p/a	4.19	9.49	4	NMS				NMS			
Bsar	46.45	21.03	12	NMS				NMS			
Found	42.96	21.03	12	NMS				NMS			
Exear	NMS			NMS				NMS			
C p/a mud	46.48	9.49	4	NMS				NMS			
Exwd	NMS			NMS				NMS			
Cjt	NMS			NMS				NMS			
Brick	NMS			NMS				NMS			
Comti	NMS			NMS				NMS			
Walcon	NMS			NMS				NMS			
C log/frame	48.06	9.49	4	14.12	7.82	3		20.06	5.99	2	CC
Shea	49.22	9.49	4	6.13	7.82	3		NMS			
								16.05	5.99	2	CT
Exwam	NMS			NMS				NMS			
C p/a mud	113.72	15.51	8	NMS				8.99	5.99	2	CC
Shof	NMS			NMS				NMS			
Wadd	8.98	9.49	4	NMS				1.04	5.99	2	CT
Intwal	NMS			NMS				NMS			
C p/a mud	136.16	9.49	4	NMS				16.04	5.99	2	CC
Rfshp	NMS			NMS				NMS			
C hip/gable	5.54	9.49	4	NMS				0.59	5.99	2	CC
Chlocs	NMS			NMS				NMS			
C cent/ offcent	16.06	9.49	4	0.16	7.82	3		21.07	5.99	2	CC
Chlocf	NMS			NMS				NMS			
Mchloc	NMS			NMS				NMS			
Chmat	NMS			NMS				NMS			
Ochl	NMS			NMS				NMS			
Rfeav	NMS			NMS				NMS			
C p/a boxed	16.18	9.49	4	NMS				3.23	5.99	2	CC
Rfrk	NMS			NMS				NMS			
Rftrsf	NMS			NMS				NMS			
Wloc	NMS			NMS				NMS			
Owinl	NMS			NMS				NMS			

TABLE 6 continued

Attribute	Ethnic Group			Date			Town			
	χ^2	cv	df	χ^2	cv	df	χ^2	cv	df	
Whead	NMS			NMS			NMS			
C p/a										
decor.	9.55	9.49	4	0.77	7.82	3	9.11	5.99	2	CC
Owin2	NMS			NMS			NMS			
C p/a										
decor.	NMS			1.03	7.82	3	9.52	5.99	2	CC
Wside	NMS			NMS			NMS			
Owin3	NMS			NMS			NMS			
Wsill	11.11	9.49	4	NMS			NMS			
							0.24	5.99	2	CT
Owin4	NMS			NMS			NMS			
							0.52	5.99	2	CT
Wsilm	NMS			NMS			NMS			
Owin5	NMS			NMS			NMS			
Wdiv	NMS			NMS			NMS			
Owin6	NMS			NMS			NMS			
Swing	NMS			NMS			NMS			
Owin7	NMS			NMS			NMS			
Spwin	NMS			NMS			NMS			
C p/a	NMS			NMS			8.69	5.99	2	CC
Baywin	NMS			NMS			NMS			
Dormer	NMS			NMS			NMS			
C p/a	11.20	9.49	4	NMS			0.33	5.99	2	CC
Dorloc	NMS			NMS			NMS			
C cent/ offcent	NMS			5.79	7.82	3	3.2	5.99	2	CC
Odr1A	NMS			NMS			NMS			
Odr1B	NMS			NMS			NMS			
Odr1C	NMS			NMS			NMS			
C p/a	24.40	9.49	4	NMS			4.76	5.99	2	CC
Doror	NMS			NMS			NMS			
Dhead	NMS			NMS			NMS			
C decor	NMS			NMS			5.62	5.99	2	CC
Odr2	NMS			NMS			NMS			
Dside	NMS			NMS			NMS			
Odr3	NMS			NMS			NMS			
Darpan	NMS			NMS			NMS			
Odr4	NMS			NMS			NMS			
Dtran	NMS			NMS			NMS			
Odr5	NMS			NMS			NMS			
Dtype	NMS			NMS			NMS			
Odr6	NMS			NMS			NMS			
Dpan	NMS			NMS			NMS			
Odr7	NMS			NMS			NMS			
Dglaz	13.64	9.49	4	10.54	7.82	3	NMS			
							17.79	5.99	2	CT
Odr8	NMS			NMS			NMS			
Strloc	NMS			NMS			NMS			
C p/a	24.35	9.49	4	3.35	7.82	3	4.1	5.99	2	CC
Ostr1	NMS			NMS			NMS			
C p/a	16.91	9.49	4	13.79	7.82	3	2.89	5.99	2	CC

TABLE 6 continued

Attribute	Ethnic Group			Date			Town		
	χ^2	CV	df	χ^2	CV	df	χ^2	CV	df
Stshp	NMS			NMS			NMS		
Ostr2	NMS			NMS			NMS		
Intstr	NMS			NMS			NMS		
C p/a	NMS			NMS			8.31	9.49	4 CC
Porgal	NMS			NMS			NMS		
C p/a	8.58	9.49	4	7.39	7.82	3	3.22	5.99	2 CC
Opch	8.86	9.49	4	NMS			NMS		
Pchsup	NMS			NMS			NMS		
Opch2	NMS			NMS			NMS		
Pchloc	NMS			NMS			NMS		
Opch3	NMS			NMS			NMS		
Pchspm	NMS			NMS			NMS		
Opch4	NMS			NMS			NMS		
Heat	NMS			NMS			NMS		
Plumb	NMS			NMS			NMS		
Prxout	NMS			NMS			NMS		
Layout	NMS			NMS			NMS		
Barn	NMS			NMS			NMS		
Outb	NMS			NMS			NMS		
Fence	1.63	9.49	4	0.88	7.82	3	NMS		
							4.87	5.99	2 CT
Shrub	2.84	9.49	4	NMS			NMS		

(See Table 5 for key to attribute labels)

Note:

χ^2 the chi-square value determined for this attribute

CV the critical value determined for this many degrees of freedom with a significance level of 0.05

df degrees of freedom

NMS no meaningful statistic: i.e. the chi-squared test cells were not adequate in the expected frequencies to produce a statistic which would have any validity

C Collapsed: where contingency tables could be collapsed to provide a meaningful statistic, they were. The basis for each collapse is mentioned after the 'C', e.g.
 C p/a - collapsed on the presence/absence of the above attribute
 C p/a mud - collapsed on the presence/absence of the above attribute

CC Doubly collapsed in the case of 'Town', i.e. collapsed as per the stated variable, and collapsed from 12 settlement areas to three.

CT Collapsed only from 12 to three town areas; not collapsed by variable as well.

TABLE 7: Oneway ANOVA Values for Ethnic Group, Date, Town Independent

Attribute	Ethnic Group			χ^2	Date			χ^2	Town	
	χ^2	CV	df		CV	df	CV		df	
Length	7.62	2.88	4	1.86	3.25	3	4.48	1.87	11	
Width	0.65	2.44	4	1.07	3.25	3	1.09	1.87	11	
Ratio	6.05	2.44	4	1.97	3.25	3	3.52	1.87	11	
Fthk	2.55	2.45	4	0.28	3.25	3	1.79	1.87	11	
Mthk	4.96	2.44	4	1.43	3.25	3	3.92	1.87	11	
Rmtot	11.36	2.44	4	2.94	3.25	3	4.58	1.87	11	
Rm1	11.91	2.44	4	2.91	3.25	3	4.15	1.87	11	
Rm2	7.58	2.45	4	1.57	3.25	3	3.36	1.93	10	
Chno	2.28	2.44	4	0.60	3.25	3	1.56	1.87	11	
Panel	1.06	2.45	4	1.16	3.25	3	0.95	1.87	11	
Pane2	0.44	2.45	4	0.73	3.25	3	1.21	1.87	11	
Opanel	2.25	2.45	4	1.67	3.25	3	1.36	1.87	11	
Opane2	0.34	2.45	4	0.66	3.25	3	0.62	1.87	11	
Nowin	6.16	2.45	4	1.87	3.25	3	4.08	1.87	11	
Totwin	5.57	2.44	4	2.61	3.25	3	3.62	1.87	11	
Dorno	5.70	2.44	4	3.76	3.25	3	1.94	1.87	11	

(See Table 5 for key to attribute labels)

TABLE 8: Most Frequent Measures for Interval Data

Attribute	British	French-Canadian	German	Scandinavian	Ukrainian
length	7-8 m	9-10 m	4-5 m	8-9/10/11/11+m	4-5 m
width	7-8 m	11+ m	8-9 m	8-9 m	9-10 m
ratio 1:	.90	.5-.75	1-1.25	.75-1	1.75-2
fthk	30-45 cm	15-30 cm	15-30 cm	15-30 cm	15-30 cm
mthk	15-20 cm	15-20 cm	15-30 cm	15-20 cm	20-25 cm
rmtot	6-8	6-8	4	4-6	2-4
rml	4	4	4	4	2
rm2	2	4	2 or 4	2	1
chno	1	1	1	1	1
panel	2	2	2	2	2
pane2	2	2	2	2	2
opanel	2	2	2	2	2
opane2	2	2	2	2	2
nowin	5-10	5-10	5-10	5-10	5-10
totwin	5-10	5-10	5-10	5-10	5-10
dorno	2	2	2	2	1

(See Table 5 for key to attribute labels)

TABLE 9: Mean Values for Interval Data

Attribute	British	French-Canadian	German	Scandinavian	Ukrainian
length	9.42 m	8.88 m	7.65 m	7.65 m	6.20 m
width	9.08 m	9.44 m	9.12 m	9.12 m	8.73 m
ratio	1.05	1.18	1.30	1.30	1.52
fthk	31.2 m	32.2 cm	25.7 cm	31 cm	30.9
mthk	17.1 cm	21 cm	18	18 cm	19.9 cm
rmtot	7	6	6	7	4
rml	4	3	3	4	2
rm2	3	3	3	3	1
chno	1	1	1	1	1
panel	2	2	2	2	3
pane2	1	2	2	2	2(1.5)
opanel	2	2	2	2(1.5)	3
opane2	2	2	2	12	2(1.5)
nowin	12	10	11	13	7
totwin	13	11	12	2	7
dorno	2	2	2		2(1.5)

(See Table 5 for key to attribute labels)

TABLE 10: Ownership, Location, and Construction Dates of Houses in Study Sample

BRITISH PRESENT OWNER	ORIGINAL OWNER	LOCATION	CONSTRUCTION DATE
Michaels	Amphlett	NE-02-40-23-4	1910
Jackson	Andrews	NW-03-20-26-4	1916
Eamor	Brown	SW-16-19-26-4	1905
Wilson	Buckley	NW-25-22-23-4	1907
Burne Estate	Burne	NW-07-23-23-4	1906
Oslanski	Curr	NE-10-40-22-4	1902
Kromm	Daly	SE-34-38-24-4	1909
Till	Daw	SW-32-22-22-4	1903
Franklin	Franklin	SE-20-45-22-4	1918
Lang	Hodgkins	SE-17-06-01-5	SP
Marcil	Jackson	S -01-39-24-4	1916
Kilgour	Kilgour	SW-30-31-23-4	1914
Lang	Lang	NE-08-06-01-5	1902
Proctor	Morrison	SE-34-46-24-4	1910
Richardson	Parlby	SE-15-40-23-4	SP
?	Prestwich	NE-02-23-23-4	SP
?	Ralston	NE-04-39-23-4	1906
Hul	Ramsey	NW-36-05-30-4	1904
Ross	Ross	NW-12-32-04-5	1911
Neilson	Russell	SW-15-39-26-4	1915
Pethyridge	Sargent	NW-02-40-24-4	SP
McBean	Scott	NE-32-22-23-4	1905
Sharp	Sharp	NW-34-39-25-4	1916
Dixon	Slack	SW-26-20-28-4	1917
Stubley	Stubley	NW-29-25-28-4	1916?
Goff	Thompson	NE-16-21-28-4	1900-1910
Simm	Turnbull	NE-09-40-23-4	SP
?	Wallace	NE-13-19-27-4	1900
Wilson	Wilson	SW-30-22-22-4	1914
Hornett	Witherby	SE-16-40-23-4	1910

TABLE 10 continued

FRENCH-CANADIAN			
PRESENT	ORIGINAL		CONSTRUCTION
OWNER	OWNER	LOCATION	DATE
FJD Ranches	Beauvais	SE-34-05-01-5	1890s
Antherian	Belcourt	Riverlot 5	SP
Warriner	Bouthier	SW-29-07-01-5	1907
Antherian	Brunelle	Riverlot 3	1920
Arcana Agency	Chevigny	NW-16-54-25-4	1895
FJK Ranches	Cyr	NE-27-06-01-5	SP
Walper	Cyr	NW-34-04-30-4	SP
Warriner	Cyr	SE-30-07-01-5	1890s
Nolte	Ethier	NW-30-55-26-4	1890
FJD Ranches	Gareau	NW-35-05-01-5	1887
Raouault	Sisters of Charity	NW-01-54-26-4	1900
Belanger	Hebert	NW-09-54-26-4	1909
Verlinde	La Fond	NW-36-54-26-4	1910
Toney	La Joie	SW-33-05-01-5	1906
Butner	Laderoute or Bechard	SW-14-54-26-4	1905
Rilo	Lavasseur.	SW-30-06-30-4	1880s
Lavigne	Lavigne	SW-33-50-24-4	1903
Toney	Le Beuf	SE-04-06-01-5	1889-1894
Pincher Creek Ranch Ltd.	Le Grandeur	NE-24-05-01-5	1896
Victoor	Loyer	Riverlot I	1895
Majeau	Majeau	SE-07-54-26-4	1910
Saffin	Meunier	SE-36-55-26-4	1906
Morasse	Morasse	Riverlot 37	SP
Unicorn Poultry Farm	Rivard	SW-28-50-24-4	1907
Pincher Creek Ranch Ltd.	Routhier	NW-24-05-01-5	SP
?	Rowland	Meadowview Dr.	1912
Victoor	Seymour	Riverlot I	1903
Osadan	Therriault	NE-26-05-01-5	1889?
Johnson	Therriault	SE-10-06-01-5	1895-1898
Turgeon	Turgeon	NE-24-55-26-4	1890

TABLE 10 continued

SCANDINAVIAN			
PRESENT	ORIGINAL		CONSTRUCTION
OWNER	OWNER	LOCATION	DATE
Lang	Altermatt	NE-32-05-01-5	1916
Anderson	Anderson	NW-30-25-28-4	1916
Anderson	Anderson	NW-19-25-24-4	1902
Anderson	Anderson	SE-22-19-26-4	1913
Ballhorn	Anderson	NE-18-45-23-4	1903
Ballhorn	Blanchard	NE-22-46-23-4	1893
Christofferson	Christofferson	SW-11-18-27-4	1917
Christofferson	Christofferson	NW-02-18-27-4	1915
Humbke	Cook	SW-28-45-22-4	1890
Lang	Cummings	NE-12-04-30-4	1901
Hagstrom	Danielson	SW-16-45-22-4	SP
Dixon	Dickson	NE-09-49-27-4	1920
Eklund	Eklund	NE-22-03-29-4	SP
Ruff	Engblom	NE-05-46-25-4	1914
Miller	Falk	SE-14-50-27-4	1902
Johnson	Johnson	NE-22-18-27-4	1910
Schoening	Larson	SW-24-05-30-4	1896
West	Larson	SW-03-46-23-4	1918
Kreutzfeldt	Lindberg	SW-04-46-23-4	SP
Strohschein	Linde or Carlson	SW-34-45-23-4	1913
Bird	Olson	SE-14-40-22-4	1902
Doupe	Pearson	SW-36-45-23-4	1908?
Pearson	Pearson	NW-02-50-27-4	1910
Coates	Peterson	SE-20-25-28-4	1907
Johnson	Pererson	SE-33-45-22-4	1900?
Rasmussen	Rasmussen	NE-14-47-23-4	1917
Johnson	Swenson	NW-28-45-22-4	1913
Vance	Vance	SW-24-04-30-4	1901-1919
Westlin	Westlin	NE-03-50-27-4	1910
Kittlitz	Westlin	NE-12-49-28-4	1903

TABLE 10 continued

GERMAN PRESENT OWNER	ORIGINAL OWNER	LOCATION	CONSTRUCTION DATE
Robertson	Bendek	SW-12-05-30-4	1897-1907
Dickau	Dickau	SE-18-46-24-4	1903
Louis Bull Reserve	Dux	SW-04-46-25-4	1914
Dux	Dux	NE-04-46-25-4	1913
Greenwall	Eikerman	NW-28-45-22-4	1911
Feitz	Feitz	SW-04-47-24-4	1900s (early)
Forth	Forth	NW-12-46-24-4	1919
Hauk	Frieman	NE-24-46-26-4	1917
Tapay	Herman	NW-32-06-02-4	1890s
?Nuckles	Hesse	NW-34-54-25-4	1914
Fuss	Huber	SE-02-47-26-4	1916
Iseke	Iseke	SE-30-54-25-4	1905
Crandall	Jacobi	NW-28-45-25-4	1916
Zilke	Kaiser	SW-16-46-24-4	1900?
Knull	Knull	SW-22-49-27-4	1910?
Schneider	Knull	NE-24-49-26-4	1900
Zilke	Kruase	NW-05-46-24-5	1914
Strohschein	Kruase	SE-26-46-25-4	SP
Stewart	Krebs	SE-13-31-04-4	1910
?Rainbow Devel.	Kreutzfeldt	SW-28-45-23-4	1910
Forth	Lenz	NW-34-45-25-4	1913
Crandall	Leschert	NW-04-46-25-4	1908
Nelson	Neiman	NE-18-45-23-4	1910
Genz	Nowochin	SW-04-46-24-4	1895
Crandall	Schmuland	NE-29-45-25-4	SP
Beer	Schoening	NW-34-05-30-4	SP
Tapay	Schultz	SE-06-07-02-5	1904
Fuss	Snyder	NW-20-46-25-4	1912
Wilson	Tost	SW-17-45-23-4	1902
Ermineskin Reserve	Wolters	NW-03-45-24-4	SP

TABLE 10 continued

UKRAINIAN			
PRESENT	ORIGINAL		CONSTRUCTION
OWNER	OWNER	LOCATION	DATE
Bryks	Bryks	SE-23-56-18-4	ca.1900
Bryks	Bryks	SW-24-56-18-4	1908
Eskow		SE-10-56-18-4	1910
Florkow	Florkow	NW-10-56-18-4	1920
Hushalak	Hushalak	NW-16-56-16-4	1919
Kostiuk		NE-06-56-18-4	1905
Kucy	Kucy	SE-18-56-18-4	1910
Kurylo		NW-28-57-18-4	1920
Lamash		NW-36-55-18-4	1900
Malica		NW-24-56-18-4	1910
Matenchuk		NE-23-56-18-4	1908
Mathews		SE-12-56-18-4	1908
Menzak		SW-16-56-16-4	SP
Michalchuk		SW-06-57-18-4	ca.1900
Nemirsky		SE-22-56-18-4	1896?
O'Kurley		NE-13-56-18-4	SP
O'Kurley		SW-14-56-18-4	sa.1900
Pacholek	Pacholek	SW-03-56-18-4	1916
Pacholek	Pacholek	SE-03-56-18-4	1910
Patan		SW-17-57-18-4	1908
Procinsky		NW-02-56-18-4	1900
Procinsky		NW-11-56-18-4	SP
Seguin		SW-24-55-18-4	1900
Snyder		SW-02-57-20-4	1898?
Sparks	Eleniuk	SW-06-57-17-4	ca.1900
Strudwick	Karoluk	SE-24-55-17-4	1900
Teminsky		NE-10-56-17-4	ca.1900
Weleschuknow		SE-30-57-16-4	1897?
Yurkiew		SE-36-55-18-4	1900
Yurkiew		NE-25-55-18-4	1900

Note: Locations are given in Dominion Land Survey (DLS) notation.

In deference to the house owners, as agreed with them, for their protection of their privacy and property, this is the only locational information to be provided, other than the following: All non-DLS locations are in St. Albert, Alberta.

S.P. Study Period

Figure 1: Location of Houses Studied
and Railway Construction

drawn by the author after
Alix Clive Historical Clubs (1974); Dawson (1936);
The Dinton Women's Institute et. al. (1965); The Government
of Alberta (1961;1980); Reynolds (1975); Silver (1938).

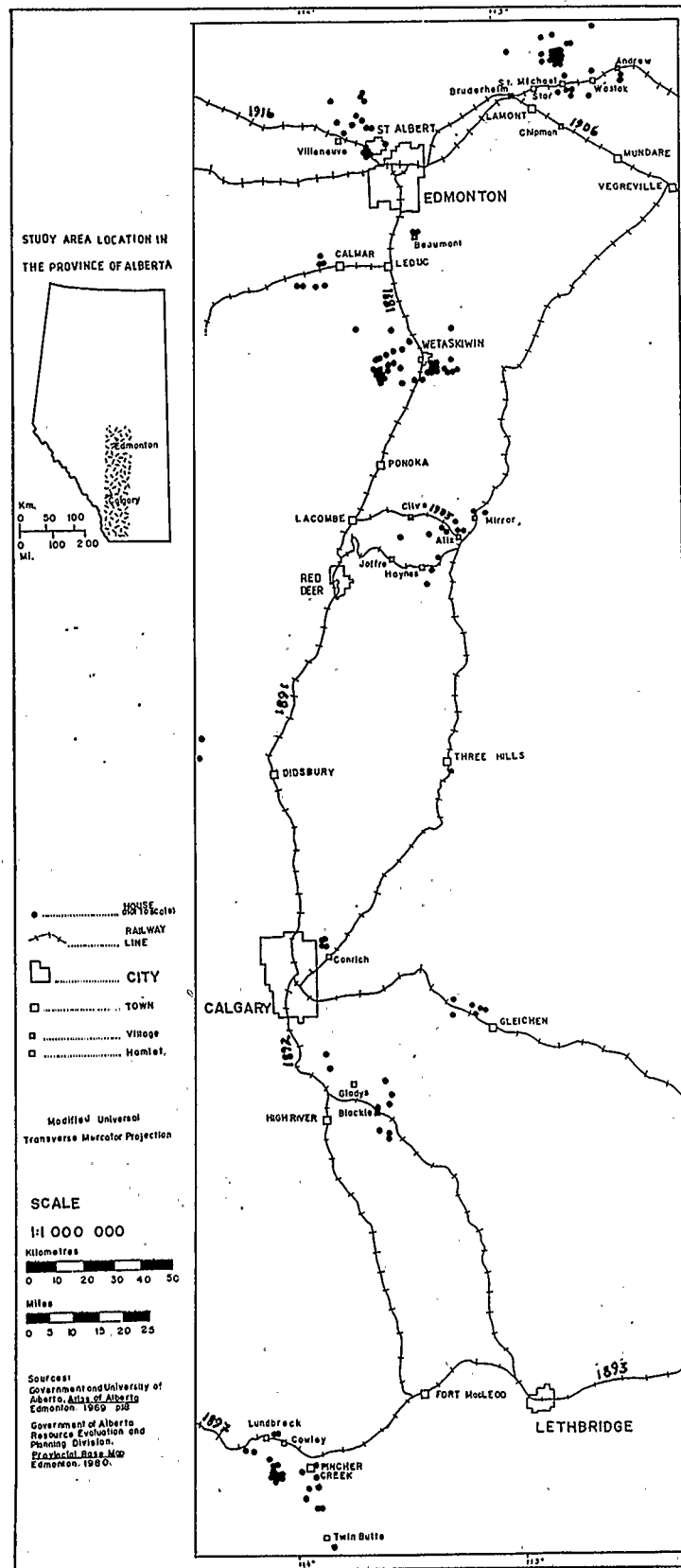


Figure 2: Location of Houses Studied Indicating Ethnic
Affiliation

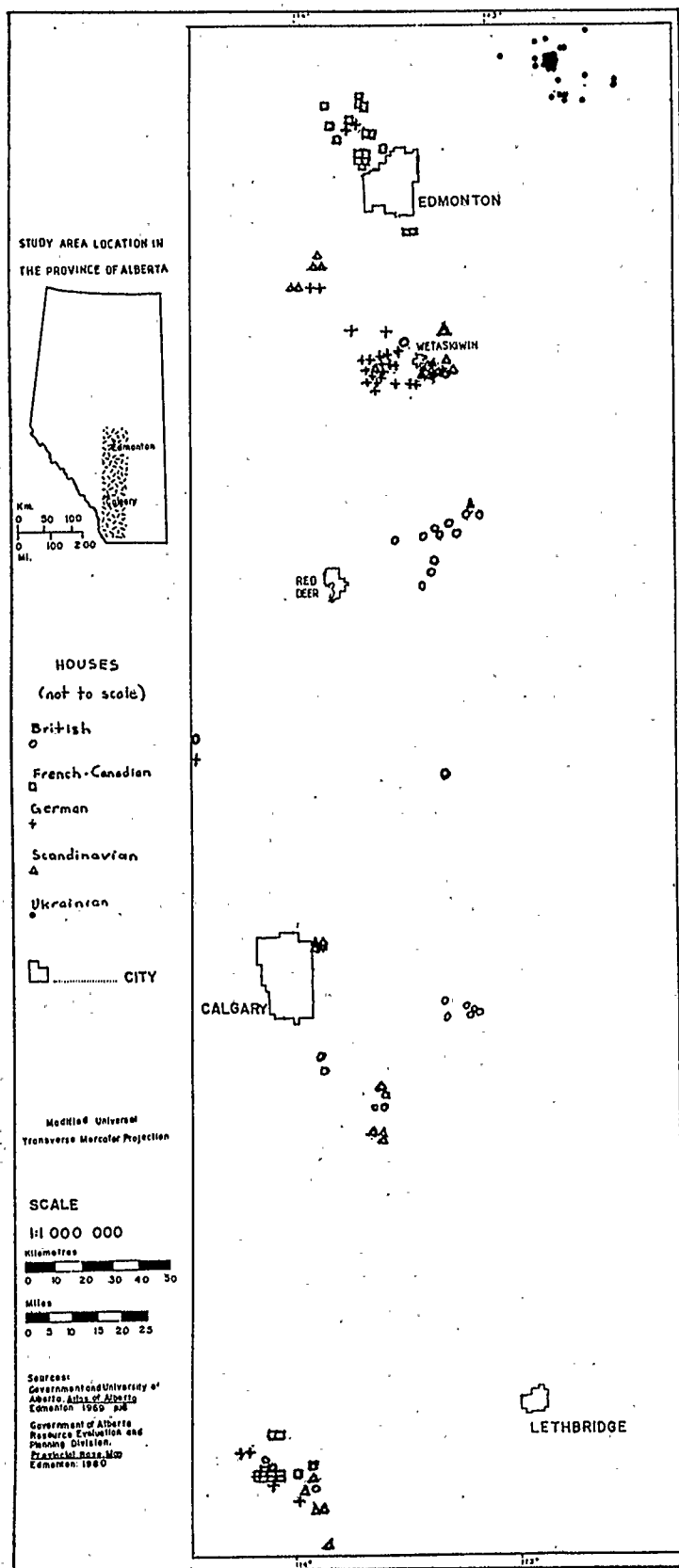


Figure 3: House Recording Code





























































after Bray et. al. (1979)
modified and drawn by the author

1	DATE		T.C or 79 Turn of Century	P.T or 21 pre 1920	2	PRESENT USE		0 uninhabited	1 inhabited
3	SITE		9 unknown	1 original	2 moved	4	BUILDING LENGTH		metric British
5	BUILDING WIDTH		metric British		6	RATIO width length = : 1			
7	WALL THICKNESS: FOUNDATIONS, MAIN FLOOR								99 unknown metric British
8	total # of rooms		99 unknown	9 #rooms main floor	99 unknown	10 #rooms second floor	99 unknown		
11	HALL MAIN FLOOR		9 unknown	0 none	1 present				
12	STOREYS								
	9 unknown	1	2 1 1/2	3 2	4 2 1/2				
13	PLAN								
	1 square	2 rectangle	3 rectangle	4 L	5 T	6 irregular	7 cruciform		
14	EXTENSIONS								
	0	1	2	3	4	5	6	13	14
	23	24	3 2	42	12	34			
15	BASEMENT AREA								
	0 none	9 unknown	1 dugout	2 partial	3 full				
16	FOUNDATION MATERIAL								
	0 none	9 unknown	1 log sill	2 rubble masonry	3 stones	4 concrete	5 brick		
17	EXTERIOR WALL MATERIALS - EARTH								
	0 none	1 mud plaster	2 limed mud plaster						
18	WOOD								
	0 none	1 round log	2 squared log	3 clapboard	4 shiplap	5 shingle	6 shingle/clapboard		

30 CHIMNEY LOCATION FRONT TO BACK											
9	unknown										
		centre 1	offset 2 front	offset 3 rear	4 front	5 rear	70	71	72		
31 MULTIPLE CHIMNEY LOCATION											
20											
	80	81	82	83	84	85	86	87			
32 CHIMNEY NO.											
88		number									
		0 unknown									
33 CHIMNEY MATERIAL											
9	unknown										
		9 unknown	1 metal	2 brick	3 cement						
34 ROOF TRIM EAVES TYPE											
9	unknown										
		rafters 1	fascia 2	frieze 3	box cornice 4	decorated 5 box	sloped 6 soffit	#6 7 frieze	#4 & 8 frieze		
35 ROOF TRIM RAKING TYPE											
10	#8		9	unknown	none						
						verges 1	fascia 2	box 3 cornice	decorated 4 #3	#3 & 5 frieze	#3 & 6 brackets
36 ROOF TRIM SPECIAL FEATURES											
#3 & 7 returns	decorated 8 #7	9	none								
				belvedere 1	finial 2	pendant 3	added 4 gables	#4 & 5 window	bracket 6		
37 WINDOW LOCATION				38 WINDOW OPENING SHAPE				39 OTHER WINDOW 1			
9	unknown	ground/ first floor	second floor	9	unknown			see main window list; if same is preceded by a "1"			
		1	2			1	2				
40 WINDOW HEAD											
0	none	9	unknown					41 OTHER WINDOW 2 all "other window" lists follow rules of "other window 1"			
				plain 1	moulded 2	shaped 3	voussoirs 4				

42 WINDOW SIDES		43 OTHER WINDOW 3		44 WINDOW SILLS		45 OTHER WINDOW 4	
none	unknown			unknown			
0	9	1 plain	2 moulded	9	1 lug sill	2 slip sill	
46 WINDOW SURROUNDS MATERIAL				47 OTHER WINDOW 5			
9 unknown 1 wood 2 concrete							
48 WINDOW DIVISIONS						49 OTHER WINDOW 6	
unknown							
9	1 sash	2 2sash	3 sash/transom	4 sash/sideights	5 sash/mullion		
50 WINDOW SWING						51 OTHER WINDOW 7	
unknown							
9	1 double hung	2 casement	3 sliding	4 fixed	5 pivot		
52 WINDOW PANES						53 OTHER PANE 1,2	
upper/left sash	99 ?	0	1	2	3	4	5
lower/right sash	99 ?	0	1	2	3	4	5
		6	7	8	9	10	11
		12					
54 SPECIAL WINDOWS							
none							
0	1 coloured glass	2 frosted glass	3 leaded glass	4 multi panes			
55 NO. OF WINDOWS MAIN STRUCTURE				56 TOTAL NO. OF WINDOWS			
57 BAY WINDOWS							
none	ground floor	ground-second floor					
58 DORMER SHAPE							
none							
0	1 gable	2 overhang gable	3 pediment	4 decorated gable	5 hipped	6 shed	7 triangular
	#2 from 10 eaves	#3 from 11 eaves	#6 from 12 eaves	#7 from 13 eaves			
59 NO. OF DOORS							

60 MAIN DOOR LOCATION													
9	unknown												
		centre 1 gable	centre 2 main	offset 3 gable	offset 4 gable	offset 5 main	offset 6 main	multiple 7 main					
61 OTHER DOOR LOCATION (1)													
0	none	unknown	code as per above and →	upper storey	11	12	13	14	15	16	17		
				basement	21	22	23	24	25	26	27		
62 MAIN DOOR ORIENTATION													
9	unknown	1 N	2 S	3 E	4 W	5 NE	6 NW	7 SE	8 SW				
63 DOOR HEAD							64 OTHER DOOR 2						
0	none	unknown					see main door list if same, is preceded by a "1"						
			plain 1	moulded 2	shaped 3	pediment 4							
65 DOOR SIDES							66 OTHER DOOR 3						
0	none	unknown			all "other door" lists follow rules of "other door 1"								
			plain 1	moulded 2									
67 DOOR ARCHITRAVE				68 OTHER DOOR 4		69 DOOR TRANSOM				70 OTHER DOOR 5			
0	none	unknown				none	unknown						
			1					0					
71 DOOR TYPE													
9	unknown												
		11	12	21	31	32	33	34	41	42	43	44	45
	46	51	52	53	54	55	61	62	63	64	65	66	71
	72	81	82	10	13								
72 OTHER DOORS 6													
9	unknown												

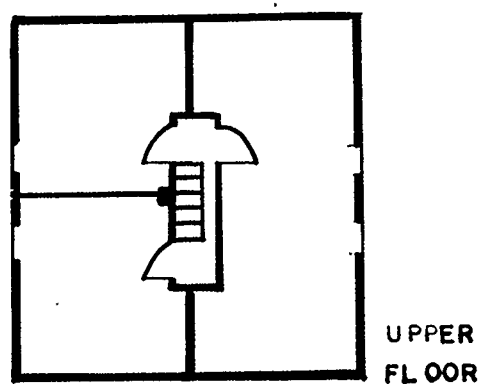
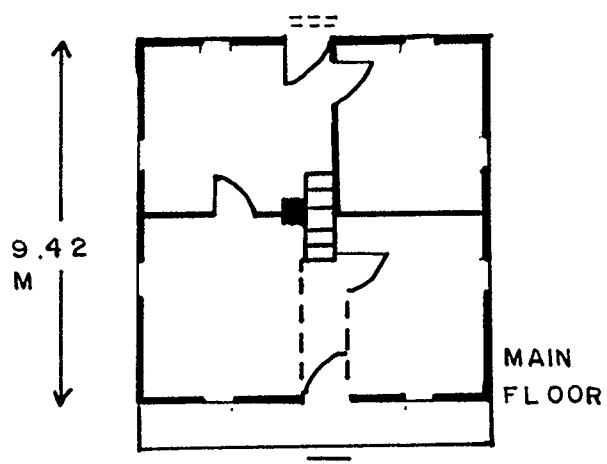
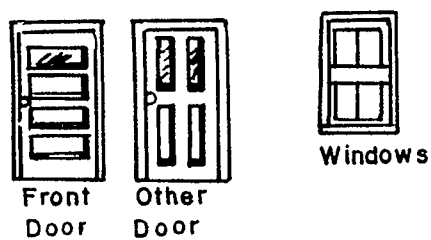
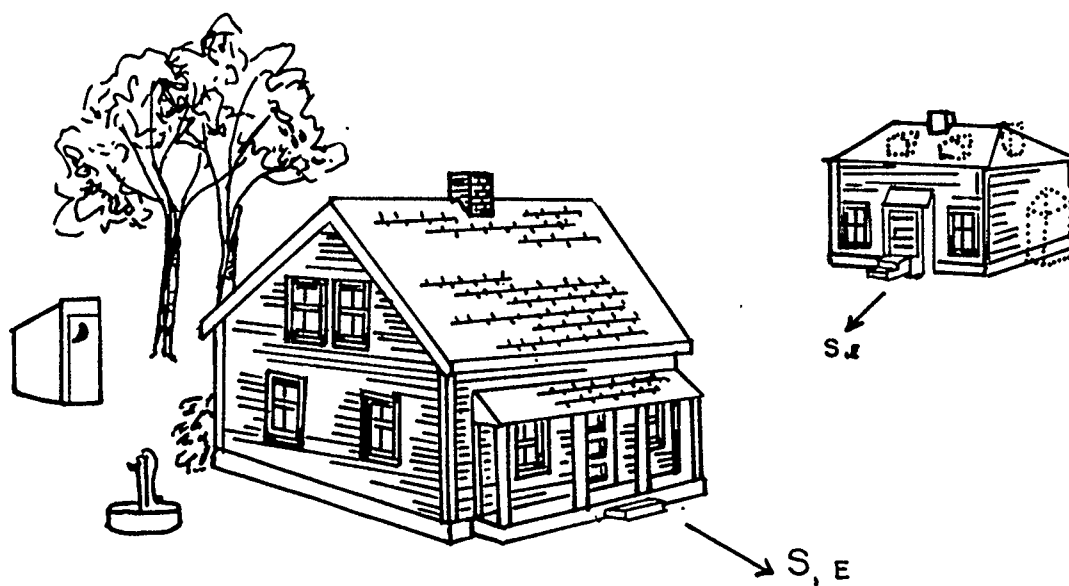
73	MAIN DOOR PANELS					74	OTHER DOOR 7				
											
	unknown 9	recessed 1	bevelled 2 recess	flush 3							
75	MAIN DOOR GLAZING					76	OTHER DOOR 8				
											
	none 0	unknown 9	partly 1 glazed								
77	STAIR LOCATION					78	OTHER STAIR 1				
											
	none 0	ground 1	ground & 2 railing	ground & 3 solid rail	upper & 4 rail					all "other stairs" see "stair" list if same is preceded by a "1"	
79	STAIR SHAPE					80	OTHER STAIR 2				
											
	none 0	straight 1	straight 2 side	all sides 3							
81	INTERIOR STAIR LOCATION										
											
	none 0	unknown 9	centre 1	centre 2 rear	side 3 left	side 4 right	offset 5 left	offset 6 right	rear 7 left	offset 8 rear	
82	PORCH - GALLERY					83	OTHER PORCH 1				
											
	none 0	stoop 1	open 2 porch	closed 3 porch	veranda 4	veranda 5 closed				all "other porches" see "porch" list if same is preceded by a "1"	
84	PORCH - GALLERY SUPPORT					85	OTHER PORCH 2				
											
	none 0	posts 1	piers 2	columns 3	wall 4	supports 5 on piers					
86	PORCH LOCATION					87	OTHER PORCH 3				
											
	none 0	front 1	rear 2	side 3	front & 4 side	rear & 5 side					
88	PORCH SUPPORT MATERIAL					89	OTHER PORCH 4				
											
	none 0	unknown 9	wood 1	stones 2	concrete 3	plaster 4 (mud)					
90	HEATING										
											
	unknown 9	stove 1	furnace 2	fireplace & stove 3	fireplace & furnace 4	furnace & stove 5					
91	PLUMBING										
											
	unknown 9	all indoor 1	all outdoor 2	outside w.c. inside 3 water	inside w.c. outside 4 water						

92 PROXIMITY TO OUTBUILDINGS											
unknown	0-100 ft	100-500 ft	500-1000 ft								
9	1	2	3								
93 LAYOUT OF FARM											
unknown											
9	1	2 court	3	4	5	6	7	8			
10	H	scattered	H								
11											
12											
PROPERTY FEATURES											
94 Barn	95 Out Building	96 Fence	97 Decorative trees/shrubs	for the preceding, '9' denotes unknown							
0 none	0 none	0 none	0 none								
1 present	1 present	1 present	1 present								
98 LOCATION											
1 NE 2 NW 3 SE 4 SW	1/4 section	township	range	west of meridian	note: Riverlots denoted by a "1", then lot number house numbered just "1" is on Meadowview Dr. in St. Albert						
99 CODE											
CODE 1 Location by Town											
Pincher Creek	Gleichen	Blackie De Winton	Conrich	Three Hills	Didsbury	Alix Mirror Haynes	Wetas kiwin	Calmar	Beaumont	St. Albert	Andrew Bruderheim St. Michael Wostok
1	2	3	4	5	6	7	8	9	10	11	12
CODE 2											
a number to label houses in ascending order going N-S and E-W											
CODE 3 Ethnic Affiliation											
1 British BE English BI Irish BS Scottish	2 French-Canadian	3 German	4 Scandinavian SN Norwegian SS Swedish	5 Ukrainian							
also noted per each house: Roof Material; Roof Construction; Chimney Unit; Roof Eave Material; Window Surround Material; Door Opening Shape; Door Surround Material; Condition of Building; Comments											

Figure 4: Most Common British House

Note: Smaller house and dotted attributes
show next most common, and unique
attributes.

(drawn by author as a composite sketch based
upon most frequent nominal and mean interval
attributes noted per ethnic group).

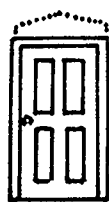
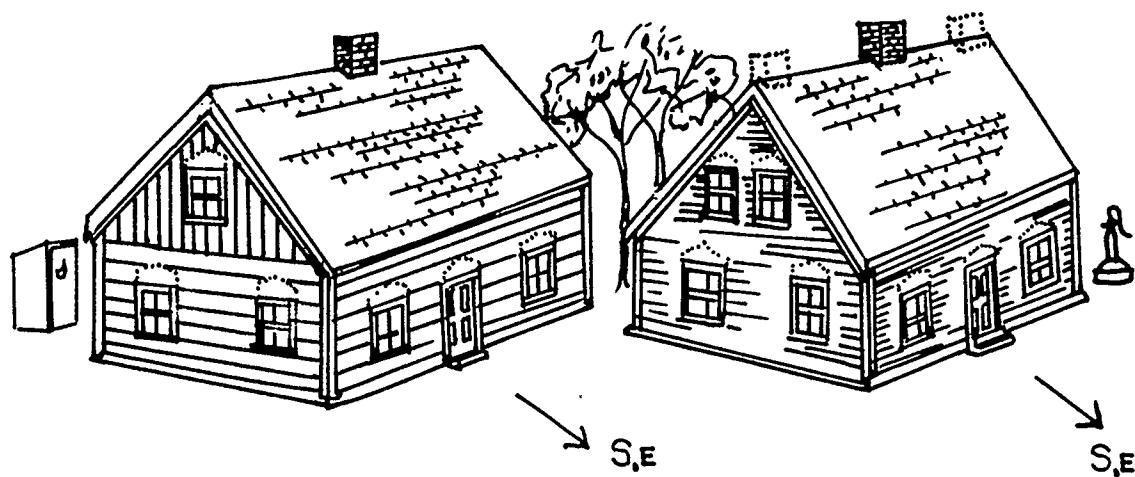


WALL THICKNESS: Foundations 31 cm

Main floor 17 cm

Figure 5: Most Common French-Canadian House

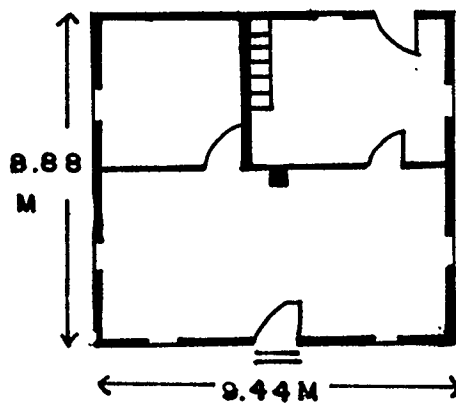
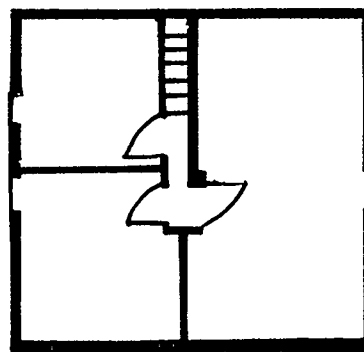
Note: Equal likelihood for either house.
Dotted attributes represent next most
common, and/or unique attributes.
(drawn by author as a composite sketch based upon
most frequent nominal and mean interval
attributes noted per ethnic group)



Door



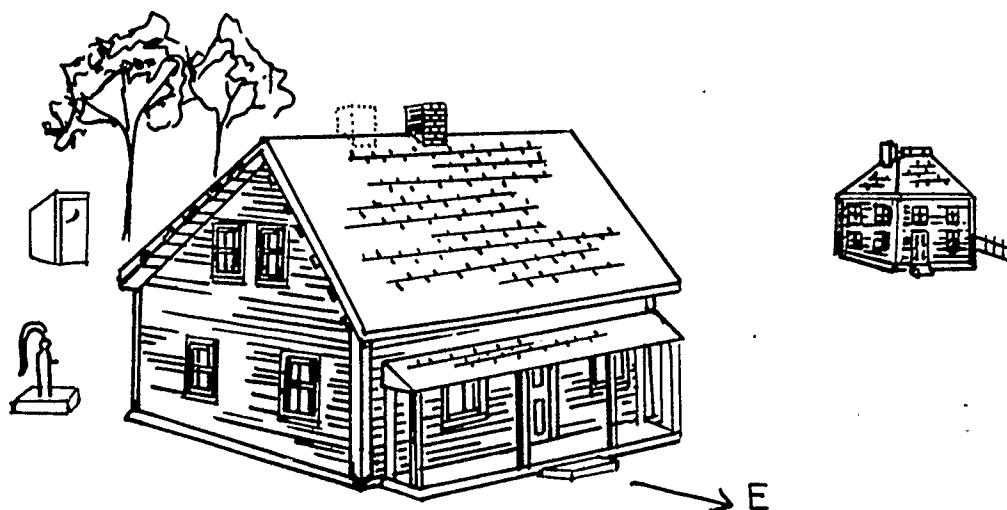
Window

MAIN
FLOORUPPER
FLOOR

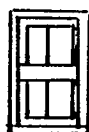
WALL THICKNESS: Foundations 25 cm
Main floor 21 cm

Figure 6: Most Common German House

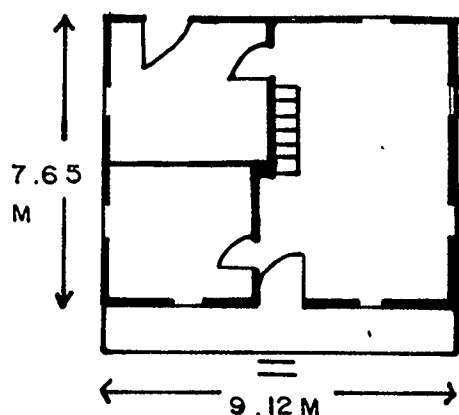
Note: Small house and dotted lines show next
most common, and/or unique attributes.
(drawn by author as a composite sketch
based upon most frequent nominal and mean
interval attributes noted per ethnic group.



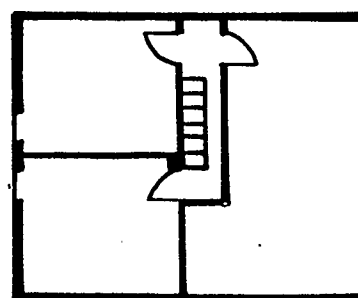
Doors



Windows



MAIN
FLOOR



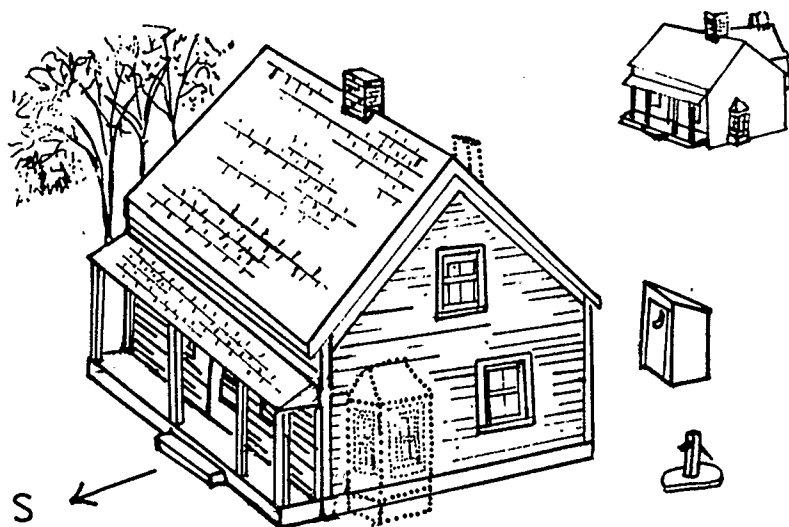
UPPER
FLOOR

WALL THICKNESS: Foundations 26 cm

Main floor 18 cm

Figure 7: Most Common Scandinavian House

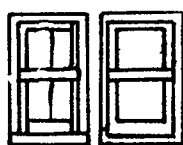
Note: Small house and dotted lines show
next most common and/or unique attributes.
Although rectangular plan was more common,
the "L" plan suits dimensions and presence
of rear extensions observations better.
(drawn by author as a composite sketch
based upon most frequent nominal and mean
interval attributes noted by ethnic group).



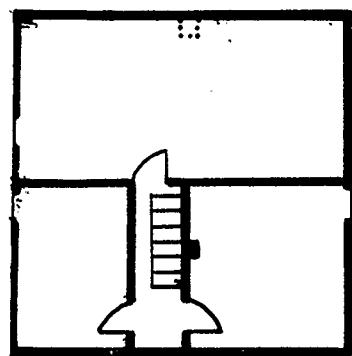
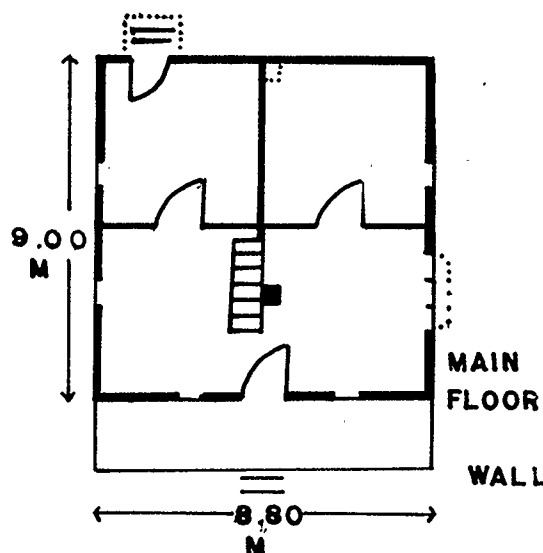
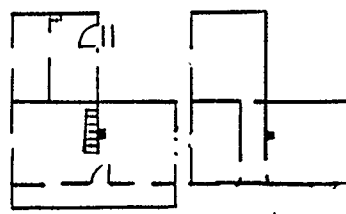
Front
Door



Other
Door



Window
Other Window
55% 41%

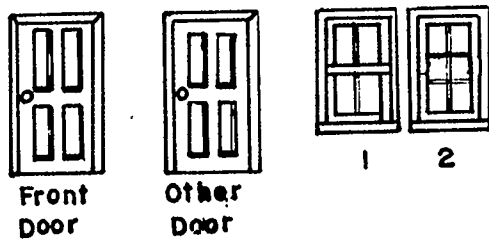
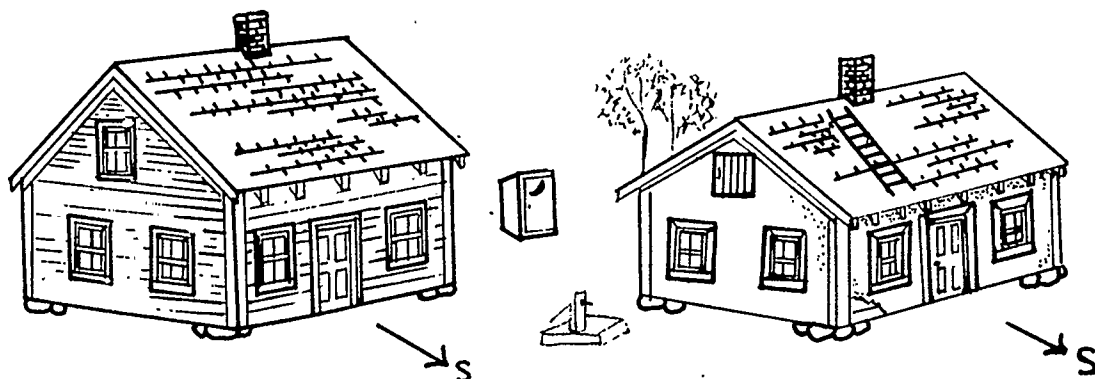


UPPER
FLOOR

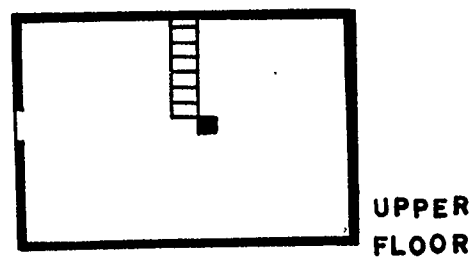
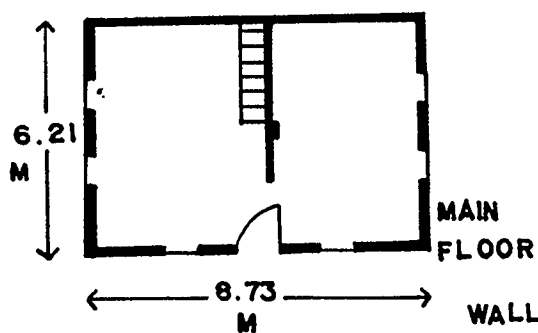
WALL THICKNESS: Foundations 26 cm
Main floor 18 cm

Figure 8: Most Common Ukrainian House

Note: Equal likelihood for either house.
(drawn by author as a composite sketch
based upon most frequent nominal and mean
interval attributes noted per ethnic group).



NOTE:
 1 most common
 2 unique to Ukrainians



WALL THICKNESS: Foundations 26 cm
 Main floor 20 cm

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