1994

Border crossings: The diffusion of scarlet fever in mid-Victorian Essex County (Ontario).

Kathleen Amanda Lillian. Smith
University of Windsor

BORDER CROSSINGS: THE DIFFUSION OF SCARLET FEVER IN MID-VICTORIAN ESSEX COUNTY

by

Kathleen A.L. Smith

A Thesis
Submitted to the Faculty of Graduate Studies and Research
through the Department of History
in Partial Fulfillment of the Requirements for
the Degree of Master of Arts at the
University of Windsor

Windsor, Ontario, Canada

1994

ISBN 0-315-93315-1

Canada

Name KATHLEEN A. L. SMITH

Dissertation Abstracts International is arranged by broad, general subject categories. Please select the one subject which most nearly describes the content of your dissertation. Enter the corresponding four-digit code in the spaces provided.

CANADIAN SOCIAL HISTORY — SUBJECT TERM

0334 — SUBJECT CODE

U·M·I

Subject Categories

THE HUMANITIES AND SOCIAL SCIENCES

COMMUNICATIONS AND THE ARTS
- Architecture 0729
- Art History 0377
- Cinema 0900
- Dance 0378
- Fine Arts 0357
- Information Science 0723
- Journalism 0391
- Library Science 0399
- Mass Communications 0708
- Music 0413
- Speech Communication 0459
- Theater 0465

EDUCATION
- General 0515
- Administration 0514
- Adult and Continuing 0516
- Agricultural 0517
- Art 0273
- Bilingual and Multicultural 0282
- Business 0688
- Community College 0275
- Curriculum and Instruction 0727
- Early Childhood 0518
- Elementary 0524
- Finance 0277
- Guidance and Counseling 0519
- Health 0680
- Higher 0745
- History of 0520
- Home Economics 0278
- Industrial 0521
- Language and Literature 0279
- Mathematics 0280
- Music 0522
- Philosophy of 0998
- Physical 0523
- Psychology 0525
- Reading 0535
- Religious 0527
- Sciences 0714
- Secondary 0533
- Social Sciences 0534
- Sociology of 0340
- Special 0529
- Teacher Training 0530
- Technology 0710
- Tests and Measurements 0288
- Vocational 0747

LANGUAGE, LITERATURE AND LINGUISTICS
- Language
  - General 0679
  - Ancient 0289
  - Linguistics 0290
  - Modern 0291
- Literature
  - General 0401
  - Classical 0294
  - Comparative 0295
  - Medieval 0297
  - Modern 0298
  - African 0316
  - American 0591
  - Asian 0305
  - Canadian (English) 0352
  - Canadian (French) 0355
  - English 0593
  - Germanic 0311
  - Latin American 0312
  - Middle Eastern 0315
  - Romance 0313
  - Slavic and East European 0314

PHILOSOPHY, RELIGION AND THEOLOGY
- Philosophy 0422
- Religion
  - General 0318
  - Biblical Studies 0321
  - Clergy 0319
  - History of 0320
  - Philosophy of 0322
- Theology 0469

SOCIAL SCIENCES
- American Studies 0323
- Anthropology
  - Archaeology 0324
  - Cultural 0326
  - Physical 0327
- Business Administration
  - General 0310
  - Accounting 0272
  - Banking 0770
  - Management 0454
  - Marketing 0338
- Canadian Studies 0385
- Economics
  - General 0501
  - Agricultural 0503
  - Commerce-Business 0505
  - Finance 0508
  - History 0509
  - Labor 0510
  - Theory 0511
- Folklore 0358
- Geography 0366
- Gerontology 0351
- History
  - General 0578
  - Ancient 0579
  - Medieval 0581
  - Modern 0582
  - Black 0328
  - African 0331
  - Asia, Australia and Oceania 0332
  - Canadian 0334
  - European 0335
  - Latin American 0336
  - Middle Eastern 0333
  - United States 0337
- History of Science 0585
- Law 0398
- Political Science
  - General 0615
  - International Law and Relations 0616
  - Public Administration 0617
- Recreation 0814
- Social Work 0452
- Sociology
  - General 0626
  - Criminology and Penology 0627
  - Demography 0938
  - Ethnic and Racial Studies 0631
  - Individual and Family Studies 0628
  - Industrial and Labor Relations 0629
  - Public and Social Welfare 0630
  - Social Structure and Development 0700
  - Theory and Methods 0344
- Transportation 0709
- Urban and Regional Planning 0999
- Women's Studies 0453

THE SCIENCES AND ENGINEERING

BIOLOGICAL SCIENCES
- Agriculture
  - General 0473
  - Agronomy 0285
  - Animal Culture and Nutrition 0475
  - Animal Pathology 0476
  - Food Science and Technology 0359
  - Forestry and Wildlife 0478
  - Plant Culture 0479
  - Plant Pathology 0480
  - Plant Physiology 0817
  - Range Management 0777
  - Wood Technology 0746
- Biology
  - General 0306
  - Anatomy 0287
  - Biostatistics 0308
  - Botany 0309
  - Cell 0379
  - Ecology 0329
  - Entomology 0353
  - Genetics 0369
  - Limnology 0793
  - Microbiology 0410
  - Molecular 0307
  - Neuroscience 0317
  - Oceanography 0416
  - Physiology 0433
  - Radiation 0821
  - Veterinary Science 0778
  - Zoology 0472
- Biophysics
  - General 0786
  - Medical 0760

EARTH SCIENCES
- Biogeochemistry 0425
- Geochemistry 0996
- Geodesy 0370
- Geology 0372
- Geophysics 0373
- Hydrology 0388
- Mineralogy 0411
- Paleobotany 0345
- Paleoecology 0426
- Paleontology 0418
- Paleozoology 0985
- Palynology 0427
- Physical Geography 0368
- Physical Oceanography 0415

HEALTH AND ENVIRONMENTAL SCIENCES
- Environmental Sciences 0768
- Health Sciences
  - General 0566
  - Audiology 0300
  - Chemotherapy 0992
  - Dentistry 0567
  - Education 0350
  - Hospital Management 0769
  - Human Development 0758
  - Immunology 0982
  - Medicine and Surgery 0564
  - Mental Health 0347
  - Nursing 0569
  - Nutrition 0570
  - Obstetrics and Gynecology 0380
  - Occupational Health and Therapy 0354
  - Ophthalmology 0381
  - Pathology 0571
  - Pharmacology 0419
  - Pharmacy 0572
  - Physical Therapy 0382
  - Public Health 0573
  - Radiology 0574
  - Recreation 0575
  - Speech Pathology 0460
  - Toxicology 0383
- Home Economics 0386

PHYSICAL SCIENCES

Pure Sciences
- Chemistry
  - General 0485
  - Agricultural 0749
  - Analytical 0486
  - Biochemistry 0487
  - Inorganic 0488
  - Nuclear 0738
  - Organic 0490
  - Pharmaceutical 0491
  - Physical 0494
  - Polymer 0495
  - Radiation 0754
- Mathematics 0405
- Physics
  - General 0605
  - Acoustics 0986
  - Astronomy and Astrophysics 0606
  - Atmospheric Science 0608
  - Atomic 0748
  - Electronics and Electricity 0607
  - Elementary Particles and High Energy 0798
  - Fluid and Plasma 0759
  - Molecular 0609
  - Nuclear 0610
  - Optics 0752
  - Radiation 0756
  - Solid State 0611
- Statistics 0463

Applied Sciences
- Applied Mechanics 0346
- Computer Science 0984
- Engineering
  - General 0537
  - Aerospace 0538
  - Agricultural 0539
  - Automotive 0540
  - Biomedical 0541
  - Chemical 0542
  - Civil 0543
  - Electronics and Electrical 0544
  - Heat and Thermodynamics 0348
  - Hydraulic 0545
  - Industrial 0546
  - Marine 0547
  - Materials Science 0794
  - Mechanical 0548
  - Metallurgy 0743
  - Mining 0551
  - Nuclear 0552
  - Packaging 0549
  - Petroleum 0765
  - Sanitary and Municipal 0554
  - System Science 0790
- Geotechnology 0428
- Operations Research 0796
- Plastics Technology 0795
- Textile Technology 0994

PSYCHOLOGY
- General 0621
- Behavioral 0384
- Clinical 0622
- Developmental 0620
- Experimental 0623
- Industrial 0624
- Personality 0625
- Physiological 0989
- Psychobiology 0349
- Psychometrics 0632
- Social 0451

ABSTRACT

Local area studies are undertaken mainly for two reasons: to demonstrate a common situation, or to explain an anomaly. In the case of Essex County in 1871, the circumstances were similar to other counties in Ontario, and yet there was a situation which was not encountered in the areas with which it could be compared. In that year there was an epidemic of scarlet fever in Essex County which claimed 124 lives. While there are several factors which could produce the occurrence of an epidemic, there was only one which was responsible for the outbreak in this region. This one factor, which was not found in any of the other counties studied, was the close, daily contact between the residents of Essex County and the City of Detroit.

Scarlet fever is a bacterial infection which is highly contagious, and therefore opportunities for contact condition the prevalence of its incidence. In Essex County approximately 22 percent of the deaths recorded on the 1871 Census were due to scarlet fever, a number higher than in any other county that year. An integral part of studying the epidemic is understanding the context within which it occurred; a context which included nineteenth century social conditions, prevailing attitudes toward death and illness, and the various medical and scientific theories which were followed. The counties of Waterloo North, Bruce South, Simcoe North, and Welland were studied for comparison of conditions and were found to have been similar to Essex County. The one factor present only in Essex was the intimate link to Detroit. It

was this link, then, that was likely responsible for the outbreak of scarlet fever in 1871. The significance of the situation in Essex County is that if similar conditions were found to occur elsewhere, the same situation could arise.

ACKNOWLEDGEMENTS

I would like to express my gratitude to my committee, without whose help I could not have completed my thesis. My advisor, Dr. Kenneth Pryke, provided me with endless suggestions for different approaches to medical history, and in that way he helped me to formulate my own approach. His vast knowledge of the area was an inspiration, and I am truly fortunate to have had his guidance. Dr. Frank Innes added his medical geography expertise, helping me to comprehend a discipline which was crucial to my thesis, and to bridge the gap between the two fields. Dr. Udo Sautter's sagacious remarks were invaluable. On several occasions Dr. Sautter would quietly make a comment which would prove to be very thought provoking, teaching me to rethink my words carefully. The effort of each of these men has helped me to write a thesis in which I can take a small amount of pride. Without them it would not have possible.

In addition to the superb academic guidance I received, I was also blessed with the support of my family and friends. My parents, Fran Sikkema, Peter Smith, and Carole and Jim Young, and my brother Kevin and my sister Julie, gave me courage to carry on when I occasionally became weary and frustrated. Knowing they were behind me helped me to see a clear path to the end. The support of my friends was also very special to me. Miriam Bugeja, Diamando Diamantakos, Lisa Garant, Linda Grant, Andrew Kerr, Annette Landry, and Melanie Townsend have given me unending advice and the strength

I needed. It is my friends who have made my time as a graduate student a time I will never forget.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter One

Introduction

Local area studies are undertaken mainly for two reasons: to demonstrate that a locality is similar to a larger area, or to explain how a region differs from the general area. In the case of Essex County in 1871, the circumstances were similar to other counties in Ontario, and yet there was a situation which was not encountered in other areas with which Essex County could be compared. In that year there was an epidemic of scarlet fever in Essex County. Several possible reasons for the epidemic will be explored. The most likely causative factor, however, was the close and daily contact of the population with that of the City of Detroit. It was this contact which contributed to the outbreak and prolongation of the epidemic.

This epidemic was a significant historical event, because peoples' reactions to scarlet fever in the nineteenth century reflect an aspect of an era which is long gone but which has only in the last twenty years received any attention. Formerly, history had been written mainly about wars and politicians. With the increase of interest in social history in the 1970s, historians also began to look at the history of medicine to obtain a better understanding of the past of the common person. First the history of medicine focused on the heroes of medicine. More recently there has been a movement toward medical history. The difference lies in the perspective. Whereas the history of medicine studies the main medical achievements and the people who attained them, medical history looks at diseases and the people who were afflicted. It is

this approach that is followed in the present study. It appeared helpful to employ a multi-disciplinary methodology. In particular, nursing and medical geography texts were extensively consulted to gain a better picture of the disease itself and epidemic diffusion in general. The primary sources of data for the occurrence of the disease were the 1871 Census of Canada and the 1870 Census of the United States. Use of these sources required not only knowledge of census methods, but also of some of the methods geographers employ for population density analysis. By combining several disciplines in this way, one can gain a more complete understanding of the 1871 scarlet fever epidemic in Essex County.

Since the development of an effective treatment for scarlet fever in the 1920s, a person stricken with the disease is likely to recover. A century ago, however, the prognosis for a person afflicted with scarlet fever was probably death. This disease claimed thousands of lives in the nineteenth century and was endemic within Canada in this period. Occasionally an epidemic would arise in a particular area. Thus Essex County suffered far more deaths from scarlet fever in 1871 than other comparable counties that year. One possible explanation for this epidemic was the close daily contact with the City of Detroit.

Scarlet fever has been recognized as a distinct disease since the sixteenth century. However, due to imprecise diagnostic techniques it was often confused with diphtheria and other similar fever/rash illnesses until the advent of bacteriology in the late nineteenth century. This confusion hindered research efforts.

Early in the nineteenth century it was recognized that the severity of the disease could vary from person to person. The reasons for this were unknown in 1871, but we now know it is due to the patient's reaction to the bacteria and the degree of immunity he or she has to the bacteria. In addition to a variation in severity, there also appeared to be a seasonal cycle which the disease followed. Again, it was only with more recent research that the reason for this was discovered. Scarlet fever is a respiratory affliction and therefore is more likely to occur between late fall and early spring when seasonal conditions coincide with increased indoor activities and confinement.

Looking at the records of death in 1871, it appears as though it was children who were most susceptible to scarlet fever. More recent research in bacteriology and immunology confirms this reality. Since immunity is usually conferred by exposure to the bacteria, it is those individuals with the least prior exposure (usually children) who are likely to contract the disease. Susceptibility can also depend on the severity of the strain of bacteria present. The virulence of the bacteria can vary over time, and a more virulent strain will likely result in more cases of the disease.

In the nineteenth century scarlet fever was spread by many means. A lack of understanding regarding the nature of infection and contamination compounded its spread. Like many respiratory illnesses, the most common form of transmission of scarlet fever was by coughing, sneezing, sharing utensils, and generally

occupying or sharing close quarters in home, school, or at work. Despite a rudimentary comprehension of the principles of isolation, for the most part isolating a patient was an ineffective means for containment of the disease. Isolation was rarely thorough, and the lack of sanitary precautions with utensils or bedclothes nullified any efforts in this area. To make matters worse, milk was a particulary vicious conveyor of the disease.

Contemporary beliefs framed the way people reacted to scarlet fever. Throughout the nineteenth century there was a battle between theories of contagion and miasma, and somewhere in the middle, the understanding of disease diffusion was often confused. Eventually the germ theory became popular, and great strides were taken in this area with disease-tracing based on the germ theory.

A disease which is always present with low levels of occurrence is considered to be endemic. This was the case with scarlet fever in Ontario in 1871. A disease which is endemic can quickly become epidemic when the number of cases exceeds the number expected. Several factors can determine epi- or endemicity of a disease. Important roles are played by the bacteria itself, the susceptible population, and the physical environment. In some circumstances these three factors can converge to create an epidemic in an endemic area.

To aid in tracing an epidemic there are often several sources available. The epidemic of scarlet fever in 1871 in Essex County, however, can only be accurately traced using the census from that year. Other sources are either incomplete, unreliable, or non-

existent. Unfortunately using the census creates problems related to the reliability of the source. Keeping this shortcoming in mind, one can cautiously proceed in drawing conclusions from the data provided. The information supplied by the census can aid in determining the rural and the urban geographic population densities, both of which can have an impact on the diffusion of scarlet fever. The census is also useful in tracing demographic trends, which can place the incidence of an epidemic in context. Generally, deaths due to infectious diseases (including scarlet fever) were decreasing between 1851 and 1900. While the reasons for this will be expanded upon later, what is important to note here is that scarlet fever was epidemic in Essex County in 1871.

Since its settlement, Essex County was linked with the City of Detroit, and this association continued through 1871 and beyond. Even when the railway connected Essex County with the rest of Ontario, there remained a strong tie to Detroit. This connection was likely a factor in the epidemic in Essex County. In 1871 there were enough deaths from scarlet fever in Essex County to justify use of the term epidemic. Since scarlet fever was endemic in Ontario at the time, there must have been something to trigger the rise to epidemicity. The close relations with Detroit offer one possible explanation for the severe impact of the outbreak. Other potential disease-spreading factors are explored (railway links, population density, et cetera), but none seems to be as applicable as the connection to Detroit.

Scarlet fever was endemic, and with constant cross-infection from the daily contact between residents of Essex County and Detroit, there was a greater chance of an epidemic. This contact had an incredible impact on Essex County, since the subsequent cross-infection likely increased the number of scarlet fever cases and prolonged the outbreak. The incidence of scarlet fever deaths in Detroit coincided with similar deaths in Essex County, revealing a possible pattern of diffusion.

The fact is, there was an epidemic of scarlet fever in Essex County in 1871. Essex County was not unlike many other regions in southern Ontario in the nineteenth century, so it is somewhat surprising that other comparable counties did not experience similar epidemics. The counties of Waterloo North, Bruce South, Simcoe North, and Welland each had some factors in common with Essex County, and could therefore potentially have had an epidemic of scarlet fever, but none of them experienced anywhere near the proportions seen in Essex County. The one factor present in Essex County but not in any of these other counties was the aforementioned contact with the City of Detroit.

In order to place the epidemic in perspective, it is crucial to understand the context within which it occurred. The living conditions in the nineteenth century facilitated the spread of diseases. Homes and schools (especially in winter months) were often crowded; food was sometimes contaminated (milk in particular); and growing urbanization increased the chances of contracting a disease. While these circumstances increased a

person's chances for contracting a disease, there were other factors which contributed to the menace of scarlet fever.

In 1871 there was no cure for scarlet fever, and death was more likely than recovery. In addition, it was primarily children who were affected, and they did not ostensibly contribute to the family economy. The attitudes toward these younger people helped to pattern the response to a disease which affected mostly children. This should not be interpreted, however, as a lack of compassion toward children. It was simply that it was more important to maintain the health of the primary breadwinner. In addition to this attitude, childhood deaths were common in the nineteenth century and were therefore expected and somehow accepted.

These attitudes reflect the more general perceptions of death and illness. Information regarding these perceptions in the nineteenth century is scarce, since it is only more recently that social historians have focused on this problem. From the scant information available, it is possible to piece together what some of these attitudes might have been. Many people were deeply religious and believed death to be providential. Death brought on both hysteria and quiet reflection. However, as medicine progressed, it was paralleled by changes in the attitudes toward death and illness. Increasingly the resignation was replaced by hope and efforts to find cures for disease.

Despite the early feelings about illness, scarlet fever was not treated with the same urgency as some other diseases in the

nineteenth century. The response to scarlet fever was generally passive resignation. Initially, the more visible diseases received attention. Cholera and smallpox were more visible because they afflicted people of every age and socio-economic status, and the manifestation of these diseases was particularly horrible. The priority given cholera and smallpox was reflected in the government's reaction--there was an immediate response to outbreaks of cholera and smallpox, but none to outbreaks of scarlet fever.

Compounding this apparent lack of attention to scarlet fever was the discrepancy between medical beliefs and the general avoidance of professional medical care. The harsh treatments associated with professional medicine brought distrust and avoidance, and these practitioners failed to cure scarlet fever. The lack of success by all medical practitioners in treating scarlet fever created a sense of futility.

These differing medical beliefs existed within an environment of constantly evolving scientific theories. One of the more prominent theories was miasma. Scarlet fever is a highly contagious disease, however, for a long time until the mid-nineteenth century, it was believed that disease was caused by noxious vapours from rotting human and animal waste. Efforts to clean up the streets and eliminate these wastes certainly helped to inhibit disease occurrence by creating a more sanitary environment. This seemed to prove the validity of miasma as a theory of disease causation. Only gradually did it become accepted that it was parasites which caused disease. This era culminated in the

development of Louis Pasteur's germ theory. Since scarlet fever is contagious, but contagion was not fully accepted initially, there was little progress in stemming its spread. Even when the germ theory took hold and public health emerged, scarlet fever was not a government priority.

The hypothesis of this paper is that the regular daily contact with the City of Detroit provided the right conditions for a prolonged epidemic of scarlet fever in Essex County in 1871. Background for this conclusion is provided in four chapters. Chapter Two provides an outline of the disease itself and the means for diffusion. Chapter Three discusses the specific case of the scarlet fever epidemic in Essex County, and the frequent links between Essex County and the City of Detroit. As a means for proving the hypothesis, comparison counties are studied in Chapter Four. Examination of these control groups indicates that Essex County was similar to other regions of Ontario in many respects, but the one factor unique to Essex was a close link to Detroit. It is this critical factor which likely contributed to the outbreak and aided in its rise to epidemic proportions. In Chapter Five the social context of the epidemic is explained, with reference to living conditions, people affected, different theories about medicine, and attitudes toward disease. Chapter Six summarizes the paper with the contention that while Essex County could be considered representative of other areas in Ontario, the one differentiating factor created an atmosphere within which the

epidemic could flourish, and that if similar circumstances were found to occur elsewhere, there could be a similar epidemic.

Chapter Two

Scarlet Fever and Disease Diffusion

Before embarking on the specific study of the scarlet fever epidemic in Essex County, it is necessary to outline the principles behind the disease itself and the diffusion of disease in general. Putting the knowledge of scarlet fever into historical perspective will be useful for understanding the context within which the medical practitioners of the day viewed scarlet fever. Confusion between scarlet fever and other diseases led to difficulty in diagnosis. Since the disease was hard to diagnose, it was also hard to prevent its spread. With this lack of understanding, a population was completely vulnerable to an outbreak. It is also imperative to review the clinical manifestation of scarlet fever in order to comprehend the symptoms, as they were the only indicators available in the 1870s with which to make diagnoses. In addition, it will be beneficial to explore more specific aspects of scarlet fever such as the threat to high-risk groups, immunity, virulence of the bacteria, diffusion, and long-term effects. More precise details regarding the general diffusion of diseases will also contribute to an understanding of the processes involved in the scarlet fever epidemic of 1871.

One reason for the severity of the scarlet fever epidemic in 1871 was that there was a great deal of confusion surrounding the disease, which hindered its prevention. Scarlet fever was described as a distinct disease for the first time in 1553 by Sicilian Giovanni Filippo Ingrassia (1510-1580). It is difficult

to be sure whether it was scarlet fever as we now classify it. For centuries there was a great deal of confusion concerning scarlet fever and other afflictions which shared the same visible symptoms. Thomas Sydenham (1624-1689) is credited with being the first to differentiate between measles and scarlet fever in 1676.[1] In the mid-Seventeenth century scarlet fever and diphtheria were equally perplexing to those trying to make a distinction. "The two diseases had not yet been clearly separated as independent entities but were fused and confused in the vague designation 'throat distemper.'"[2] As a result of this confusion, it is difficult to pinpoint the first case of scarlet fever in North America, but reference has been made to a plague of throat distemper in the North American colonies in 1659.[3]

In the eighteenth century diphtheria and scarlet fever were still confused because of the similar throat inflammation and identical seasonal occurrence.[4] "Before about 1880 the only way of classifying diseases was by their signs and symptoms, and classification founded on the identification of the micro-organism came late and did not always coincide with the older

---

[1]For more about Sydenham see also Charles Creighton. The History of Epidemics in Britain, vol. 2, (London, 1965), 678-85.

[2]Geoffrey Marks and William K. Beatty, Epidemics: The Story of Mankind's Most Lethal and Elusive Enemies - From Ancient Times to the Present (New York, 1976), 168.

[3]Marks and Beatty, Epidemics, 167.

[4]Erwin Heinz Ackerknecht, History and Geography of the Most Important Diseases (New York, 1965), 70.

classifications."[5] It was only with the advent of the discipline of bacteriology in the late nineteenth century that there was a definitive means of identifying the various diseases which had plagued people for centuries. "Before the days of bacteriology, a clinical distinction between two types of sore throat (scarlet fever and diphtheria) rested largely on the later symptoms, which might or might not arise."[6]

Early confusion also came from the description of scarlet fever and scarlatina as separate diseases. Scarlatina was distinguished from diphtheria in the eighteenth century by Rosen, Levison, Withering and W. Douglas.[7] By the end of that century great strides had been taken, and scarlet fever was described as a more severe manifestation of the same bacteria which caused scarlatina. R. Willan (1798-1808) gave a remarkably good and complete description of scarlet fever in his book on cutaneous diseases. He described three types:

1. scarlatina simplex with rash and sore throat
2. scarlatina anginosa with rash and sore throat which might be very severe
3. scarlatina maligna--a severe form of anginosa with sloughing of the soft tissues of throat and mouth and profound toxaemia.[8]

---

[5]Arthur H. Gale, Epidemic Diseases (Harmondsworth, 1960), 17.

[6]Gale, Epidemic Diseases, 88.

[7]Ackerknecht, History and Geography, 70.

[8]Gale, Epidemic Diseases, 90.

Willan qualified his findings by claiming that different cases of different degrees could occur in the same household.[9] The significance of all this confusion lies in the fact that while scarlet fever was recognized and distinguished early on, nothing could be done to prevent it in the nineteenth century, and so few efforts were made.

Understanding how scarlet fever manifests itself aids in explaining the reactions to the epidemic in 1871. Scarlet fever is caused by a bacterium now identified as streptococcus pyogenes group A. Clinically, scarlet fever is one of many possible reactions to a streptococcal infection. It is easily (though sometimes incorrectly) identified by several visible symptoms. It is generally characterized by a sore throat, headaches, papillated strawberry tongue, malaise, fever, a fine, mist-like rash, and as it progresses, gastrointestinal upset. It was recognition of these symptoms which formed the basis for nineteenth century diagnosis.

Like most diseases, scarlet fever follows a seasonal pattern. It is a disease of the respiratory tract, and like other respiratory diseases, it prevails in the winter months.[10] Although scarlet fever may occur at any time, it is most likely to appear in

---

[9]Gale, Epidemic Diseases, 90. It was not until well into the twentieth century that the virus responsible for scarlet fever was isolated. The final proof that scarlet fever was due to infection with hemolytic streptococci came relatively late in the history of bacteriology--in 1924--when G.F. and G.H. Dicks produced the disease experimentally in a woman volunteer. See Gale, Epidemic Diseases, 89.

[10]Ann Hardy, "Scarlet Fever," in Kenneth F. Kiple, ed., The Cambridge World History of Human Disease (Cambridge, 1993), 990.

the late fall and early spring. This corresponds with the condition of confinement in close quarters in schools and at home, and therefore helps to explain why this disease, referred to as an "acute infectious disease" by Ann Hardy,[11] can spread so rapidly. Because it is transmitted by direct respiratory contact, its spread is conditioned by opportunities for exposure.[12]

It is important to identify the high-risk groups so that these groups may be targeted for study. By definition, there is general susceptibility to the streptococcus pyogenes. In practice, however, it mostly affects those below ten years of age, and according to Parry, it is rare in infants under twelve months (although data from Essex county suggests differently). This is mainly due to differing levels of immunity. In Essex County, the high incidence of the disease in infants may be explained in various ways. Perhaps the mothers had not been exposed to that particular strain of the bacterium and therefore were unable to pass on immunity; or conceivably the mothers were malnourished. In general, however, infants are protected. From six years to adult life, susceptibility decreases.[13] Susceptibility is equally divided between males and females.[14]

---

[11]Hardy, "Scarlet Fever," 990.

[12]G.W. Anderson, M.B. Arnstein and M.R. Lester. Communicable Disease Control (New York, 1962), 307.

[13]Mary Elizabeth McInnes, Essentials of Communicable Disease (Saint Louis, 1975), 117.

[14]Wilfrid H. Parry, Communicable Diseases (London, 1979), 32.

There are two types of immunity--natural and acquired. Some people naturally have high levels of resistance to streptococcal infections.[15] Most people, however, can only have immunity to a bacterium through acquired immunity. There are two types of acquired immunity--passive and active. Passive immunity is passed on to a fetus by an immune mother, or it can be acquired through a blood serum. Immunity passed on in the fetus is intended to protect the infant in the early months; and only 20 percent of infants retain this type of immunity after the age of two years.[16] Active immunity can be gained by a vaccine, or, the most common means, by exposure to the bacteria.[17] Exposure to a bacterium will produce immunity because the parasite will produce an antigen, and this provokes the production of an antibody by the host. It is the antibody which causes immunity to that bacterium.[18] Immunity from exposure is usually permanent.[19]

As a result of immunity, resistance and susceptibility to infection is type-specific. A person may be resistant to invading streptococci, may be highly susceptible,[20] or may be resistant to one type and fall ill from another type. In addition, not everyone

---

[15]L. Claire Bennett and Sarah Searl, Communicable Disease Handbook (Ne York, 1982), 225.

[16]Hardy, "Scarlet Fever," 991.

[17]Gale, Epidemic Diseases, 15-16.

[18]Gale, Epidemic Diseases, 15.

[19]McInnes, Essentials of Communicable Disease, 118.

[20]Bennett and Searl, Communicable Disease Handbook, 224-225.

exposed to streptococci will become ill.[21] The young have little acquired immunity to bacteria after the fetal immunity wanes, and are therefore more susceptible to infection.[22]

Virulence is another important consideration in understanding the diffusion of the illness throughout a society. Whether an infection is mild or severe depends on the virulence of the particular streptococcal type and the overall health of the patient.[23] Scarlet fever is known to follow a pattern of alternate severity and mildness.[24] With its cyclical nature, the infection may exist as only sporadic cases in one year, followed by an epidemic in the next year.[25] For the purpose of this paper, an epidemic will be defined as the number of occurrences of scarlet fever exceeding the expected number in a given period. The expected number of occurrences in a non-epidemic area in 1871 was less than 0.5 per thousand.[26] The severity of the illness also depends on such factors as: the dosage; the mode of entry of the organism (whether inhaled, ingested or inoculated); the general and local tissue resistance of the patient; properties of particular strains; and through how many intermediate hosts the bacteria have

---

[21]Bennett and Searl, Communicable Disease Handbook, 220.

[22]Parry, Communicable Diseases, 2.

[23]Bennett and Searl, Communicable Disease Handbook, 220.

[24]Hardy, "Scarlet Fever," 991.

[25]McInnes, Essentials of Communicable Disease, 115.

[26]The average number of cases resulting in death in the four control groups studied in Chapter Four was 0.17 per thousand. In Essex County there were 3.79 cases per thousand.

passed (since the bacteria gain virulence as they pass through different hosts).[27] Another factor to be considered is the ability of the streptococcus to produce a toxin against which the previously unexposed individual has developed no resistance or immunity. Different strains of the streptococcus bacteria produce different amounts of toxin, and therefore the epidemic may vary in severity, with a mortality rate ranging from 0 to 300 per thousand.[28]

Thus, it can be seen that the virulence of scarlet fever fluctuates even within a single epidemic. It also fluctuates over longer periods of time. In the 1800s in England, for example, scarlet fever was the most deadly of all infantile diseases.[29] In 1871 and 1872 scarlatina was listed as second on a list of the top ten lethal diseases in Ontario; in 1877 it was number six, and after that it was not listed again for several years.[30] Ann Hardy even cites scarlet fever as the leading cause of death among infectious childhood maladies from 1820 to 1875.[31] In 1838 the Archbishop of Canterbury, Doctor Todd, lost five of his six

---

[27]Parry, Communicable Diseases, 32-33, and Gale, Epidemic Diseases, 17.

[28]Hardy, "Scarlet Fever," 990-991.

[29]Ackerknecht, History and Geography, 71.

[30]from Table C, "The following is a Record of the Ten Highest Causes of Death for the years 1871, 1872, 1873, 1874, 1876, 1877, 1878, 1879, 1880, 1881, and 1882" in Charles M. Godfrey's Medicine for Ontario: A History (Belleville, 1979).

[31]Hardy, "Scarlet Fever," 992.

children to scarlet fever within a single month.[32] In 1860 in England and Wales in every million children under fifteen years of age, 2 500 died from scarlet fever.[33] By comparison, today it is rarely life-threatening. These variations in virulence are matched in the United States[34] and Canada.

The diffusion of a disease is a critical factor in any epidemic, including the one in 1871. There are several ways scarlet fever may be transmitted: zoonosis, ingestion, insect vectors, inoculation, or inhalation. Zoonosis (animal infection) is the transmission of the bacteria from animal to man, directly or indirectly.[35] Ingestion as a means of transmitting a bacterium requires the discharge of organisms and parasites in faeces or urine and often results in the contamination of water, food, and utensils because of unwashed hands.[36] Insect vectors carry bacteria from man to man or from animal to man. "Flies readily transmit staphylococci, streptococci, dysentery, hepatitis, poliomyelitis and salmonellae from human and animal excreta or sewage to food and so may thus cause outbreaks of disease."[37] Inoculation generally only occurs from improperly sterilized needles or contaminated products (like blood) and sometimes through

---

[32]Ackerknecht, History and Geography, 70.

[33]McInnes, Essentials of Communicable Disease, 114.

[34]Ackerknecht, History and Geography, 71.

[35]Parry, Communicable Disease, 2-3.

[36]Parry, Communicable Disease, 2-3.

[37]Parry, Communicable Disease, 3.

broken skin.[38] Inhalation is the most common means of spreading scarlet fever. Inhalation of the bacteria occurs from air-borne droplets from the respiratory tract expelled by sneezing, coughing or talking. "This form of transmission is largely uncontrollable and impracticable in schools and places of entertainment."[39]

Scarlet fever is commonly spread by direct or intimate person-to-person contact,[40] droplet infection and infected dust, infected milk (due to cow mastitis or infected milk-handlers), and hospital cross-infection.[41] . Individuals may be healthy carriers of streptococcus pyogenes in their noses and throats and thereby infect others.[42] This type of spread is dangerous because it is undetectable and can not therefore be avoided.[43] One in three persons harbours the hemolytic streptococcus in his or her throat and is therefore at constant risk of sore throat, cellulitis, nephritis, rheumatic fever, erysipelas, puerperal pyrexia, scarlet fever and other afflictions.[44] The hemolytic streptococcus group A is found in the throats of 5-15 percent of normal adults and 10-20 percent of normal children.[45] A person may be a carrier in the

---

[38]Parry, Communicable Disease, 2-3.

[39]Parry, Communicable Disease, 2.

[40]Bennett and Searl, Communicable Disease Handbook, 224.

[41]Parry, Communicable Disease, 33.

[42]Bennett and Searl, Communicable Disease Handbook, 224.

[43]Herbert Sinnecker, General Epidemiology (London, 1976), 98.

[44]Parry, Communicable Disease, 32.

[45]Parry, Communicable Disease, 32.

prodromal phase of illness (before symptoms develop), in convalescence (after illness), or may be a chronic carrier.[46] Inhalation of the scarlet fever bacteria can be by direct contact or by contact with infected inanimate objects, although this latter form is more rare.[47]

As a result of the widespread and diverse nature of streptococcus bacteria, control of infection extends beyond individual care to the protection of food processing and handling to prevent contamination of foods with the bacteria.[48] For example, milk contaminated with group A hemolytic streptococcus can cause a mini-epidemic when ingested by a susceptible population.[49] Milk is a significant vehicle for the spread of scarlet fever because it can be spread in so many ways. The udder of a cow can be infected by a handler; the cow can be infected with cow mastitis; or the milk can become infected at any point from the time it is obtained from the cow until it is ingested by the consumer. Milk is also dangerous because it is a medium in which bacteria multiply quickly and therefore doses are large.[50] Pasteurization and refrigeration of milk, which have been used more

---

[46]Parry, Communicable Disease, 1.

[47]Anderson et al. Communicable Disease Control. 307.

[48]Bennett and Searl, Communicable Disease Handbook, 225.

[49]Bennett and Searl, Communicable Disease Handbook, 225.

[50]Anderson et al. Communicable Disease Control, 307.

recently to control milk-borne diseases, were unknown in the mid-nineteenth century.[51]

In a study such as this, for which the census is such an important source of data, consideration should be given to inaccuracy in the reporting of deaths. When scarlet fever is listed as the cause of death, it is probably scarlet fever. When the cause of death is given as kidney disease, however, one must consider the possibility that the kidney disease is a secondary complication of scarlet fever. While second attacks of scarlet fever are rare, there are several sequelae. Some people suffer recurrent sore throats and some children are susceptible to repeated ear infections.[52] Since the same bacteria are also responsible for rheumatic fever,[53] it is not uncommon for a person to develop rheumatic fever years later, but as a result of the original infection of scarlet fever.[54] In addition to scarlet fever and rheumatic fever, Group A Streptococci also cause angina, phlegmonia, erysipelas, puerperal infections, broncho-pneumonia, pleurisy, otitis, quinsy, nephritis, peritonsillar abscess, and sepsis, among other ailments.[55] Streptococcal sequelae are

---

[51]Bennett and Searl, Communicable Disease Handbook, 225.

[52]Bennett and Searl, Communicable Disease Handbook, 223.

[53]John R. Paul, Clinical Epidemiology (Chicago, 1958), 157.

[54]Judith S. Mausner, M.D., M.P.H. and Anita K. Bahn, ScD., M.D., Epidemiology: An Introductory Text (Philadelphia, 1974), 309.

[55]Sinnecker, General Epidemiology, 82. and Andrew Barnet Christie, Infectious Diseases, Epidemiology and Clinical Practice (Edinburgh, 1969), 985-7.

particularly likely to occur in children and young adults who have not developed as high a level of resistance to streptococcal infection. The streptococci pyogenes can also cause secondary complications of the heart or kidneys even after apparently adequate treatment of the initial illness.[56]

While it is important to understand the details of scarlet fever, it is also necessary to have a comprehension of the general principles of diffusion of diseases. The nature of disease diffusion underscores the impact of the link between the populations of Essex County and the City of Detroit. There are several methodological paradigms which may be followed in the study of disease diffusion; one method which is particularly useful for this study is plotting deaths due to a particular disease on a map to trace the spread of a disease. When beginning a study of disease distribution, it is helpful to make a distinction between epidemic and endemic, since a disease can be epidemic without having been endemic, and can be endemic without becoming epidemic; but it is rare that a disease which is endemic will not at some time become epidemic. There are several elements which make disease diffusion possible. First, there should be a parasite, but it cannot independently cause disease. There also needs to be a susceptible population, reservoirs of infection, transportation of the disease as a mode of dissemination, and the proper environment. All of these concepts are integral to the comprehension of disease

[56]Gale, Epidemic Diseases, 88.

transmission and must be fully understood before one embarks on an analysis of the scarlet fever epidemic in Essex County in 1871.

One disease-tracing methodology which both reinforced the idea of diffusion, and helped to further advance theories of contagion, is disease mapping. By describing the epidemic by time, place, and person, the researcher can plot the cases by location on a dot map. This method became accepted practice in the mid-nineteenth century, as demonstrated by John Snow's map of cholera incidence around the Broad Street Pump in Soho which suggested the disease was water-borne.[57] This method also became a favourite technique used by Medical Officers of Health in Britain.[58] A dot map is usually micro-scale, meaning that it uses a large-scale map of a small area. By plotting the incidence of a disease on a map and then superimposing environmental factors such as a water supply, milk routes, or school routes, one can get a clue as to the mode of spread.[59] One pitfall of dot maps is that the researcher must assume that the population density is uniform, and must assume there are equal levels of resistance everywhere.[60]

One distinction which must be very carefully made is that between epidemic and endemic. Norman T. Bailey suggests that "when

---

[57]R.W. Thomas, "Introduction: Issues in Spatial Epidemiology," in R.W. Thomas, ed., Spatial Epidemiology (London, 1990), 2.

[58]A.T.A. Learmonth. Disease Ecology: An Introduction (Oxford, 1988), 87.

[59]Mausner and Bahn, Epidemiology, 67.

[60]Paul, Clinical Epidemiology, 94-95. The map can be modified to avoid this problem by mapping only the susceptibles and cases.

a disease is rare, like plague or smallpox in Britain, any outbreak that occurs can be regarded as an isolated phenomemon: it is epidemic in the strict sense."[61] With more common diseases like measles, diphtheria, and influenza, there may be periodic outbreaks of an epidemic nature, but the infection is kept alive by a constant low-level spread to new susceptibles. The stock of susceptibles is constantly replenished by new recruits to the population, and also in some cases by the loss of immunity in those previously attacked. It is also possible that some diseases are reintroduced by the genetic mutation of normally harmless and widely distributed organisms to more virulent forms.[62] Alfred S. Evans defines an epidemic as a situation in which the number of cases of a disease is in excess of the expected number for a particular population based on past experience.[63] The more common diseases are endemic.[64]

The state of epidemicity is a phase in the occurrence of a disease.[65] Disease occurrence ranges from sporadic to epidemic. Herbert Sinnecker defines sporadic occurrences as the rare occurrence of individual cases in a region to which they are not native (ecdemic), which are not limited by time or space, and which

---

[61]Norman T.J. Bailey, The Mathematical Theory of Epidemics (London, 1957), 134.

[62]Bailey, Mathematical Theory, 134.

[63]Alfred S. Evans. Viral Infections of Humans: Epidemiology and Control (New York, 1989), 5.

[64]Bailey, Mathematical Theory, 134.

[65]W.H. Frost, M.D. as cited in Paul, Clinical Epidemiology, 3.

have no connection with each other within the region in which they are ecdemic.[66] An epidemic can be hypo-epidemic in its mildestform, meso-epidemic, or hyper-epidemic in its most severe form.[67] The mass outbreak of diseases, if it arises out of sporadic occurrences, can lead to the endemic occurrence of disease.[68] On the other hand,

> The mass outbreak of diseases, if it develops from endemic or enzootic occurrences of disease, always means a change of incidence, usually a transition from the hypoepidemic ot hypoenzootic situation to the epidemic or enzootic occurrences, and conversely.[69]

Likewise, there are mass outbreaks which represent a change from hypo-endemic to meso- to hyper-endemic or vice-versa. Changes like this are limited in space or time without being epidemic. Change in incidence of an epidemic, by comparison, is a long-term event which goes beyond the average time limits of epidemics and probably does not depend on short-term, but mostly long-term changes in conditions leading to outbreak.[70]

Endemic diseases are those which are not restricted in time but are limited by space.[71] A pandemic disease is limited by time but not space.[72] There was an outbreak of scarlet fever in 1871

---

[66]Sinnecker, General Epidemiology, 14.

[67]Sinnecker, General Epidemiology, 16.

[68]Sinnecker, General Epidemiology, 21.

[69]Sinnecker, General Epidemiology, 21.

[70]Sinnecker, General Epidemiology, 21.

[71]Sinnecker, General Epidemiology, 14.

[72]Sinnecker, General Epidemiology, 20.

which was not pandemic, because it did not appear in all areas of the globe, however, it was endemic in Ontario. An endemic disease, like an epidemic, can be hypo- meso- or hyper-endemic. In a hypo-endemic situation a condition can be reached in which cases are rare or do not occur for a time at all, but the germ is still present. This is known as "endemic latency".[73] A state of endemicity is a delicate balance and the introduction of more susceptibles or infected persons can easily tip the balance.[74] Both sporadic and endemic occurrences can form the starting point for mass outbreaks.[75]

Since exposure often leads to immunity, hypothetically, an entire population can be immune. In reality, the susceptibility of the population is constantly changing.

> A new immunological structure of the population therefore is built up by latent infections and by attacks of the disease. The groups of susceptible persons are diminished and those of the immune are enlarged. The result is that scarlet fever epidemics will not occur until the immune structure is displaced by alteration of the population towards the original position (new born, removals).[76]

A provocation epidemic can develop through activation of latent infections after lowering resistance.[77] Resistance of the general population is lowered by a lack of exposure, new-borns and removals

---

[73]A more detailed discussion of the varying degrees of disease occurrence is given in Sinnecker, General Epidemiology, 16.

[74]Evans. Viral Infections. 6.

[75]Sinnecker, General Epidemiology, 16.

[76]Sinnecker, General Epidemiology, 150-151.

[77]Sinnecker, General Epidemiology, 198.

(deaths, recoveries or emigration) and therefore introduction by an outsider could spark a new epidemic.

In the study of disease susceptibility Judith S. Mausner discusses three environments which relate to diseases. The biological environment consists of the infectious agents of disease, the reservoirs of infection, vectors, and plants and animals consumed.[78] The social environment includes the customs of the population (food eaten, method of preparation, etcetera), receptivity to new health ideas, and geographic mobility.[79] The third environment she defines is the physical environment which is simply heat, light, air, living space, water and the like.[80]

In a similar fashion John R. Paul lists the seed, soil and climate as necessary preconditions for disease. The seed which Paul describes is a parasite that can be isolated and blamed, but can not single-handedly produce disease.[81] The soil relates to the resistance of the patient, which must be low for a disease to take hold and cause illness.[82] Climate is the physical environment to which seed and soil are exposed, and it includes the household conditions, poverty, sanitation, occupation, and temperature.[83]

---

[78]Mausner and Bahn, Epidemiology, 30.

[79]Mausner and Bahn, Epidemiology, 30-31.

[80]Mausner and Bahn, Epidemiology, 31.

[81]Paul, Clinical Epidemiology, 50.

[82]Paul, Clinical Epidemiology, 51-52.

[83]Paul, Clinical Epidemiology, 54.

The climate affects the exposure to illness and conditions resistance to it.

Paul recounts three theories for the genesis of an epidemic in an endemic area.[84] The first is the mutation in a parasite in inter-epidemic stage which leads to a more virulent strain. The second is that immunity has begun to decline or the number of susceptibles has increased. The third is that there has been a change in the environment, for example the breakdown of sanitary conditions, poor diet, etcetera. This may also include transportation which facilitates the introduction of new people, adding to susceptibles and possibly bringing disease.

The categories outlined by Mausner and Paul provide a useful context for a discussion of the different aspects of disease transmission. First, a look at the actual clinical introduction of a parasite precisely corresponds to what Mausner calls the biological environment and what Paul refers to as the seed. Following this, it is useful to examine susceptibility, which includes the concepts of threshold populations and social distance; as well as a look at reservoirs. These both fit neatly in to the areas of biological environment and soil. Transportation as a means of diffusion is covered by Mausner under the heading of social environment and by Paul under climate. Finally, the environment in general, which includes the seasons, climate and sanitation, belongs to the physical environment according to the categories as outlined by Mausner, and to climate according to

---

[84]Paul, Clinical Epidemiology, 61.

Paul. These are the necessary elements for effective disease diffusion.

An obvious necessity for an epidemic is the parasite. This is the organism which causes illness, but it does not act alone. In the case of scarlet fever the parasite is the Streptococcus A bacterium. Amongst the other factors which make an illness possible is the fact that the host must react to the parasite. In order for this to happen, there must be an introduction of the parasite into the body of the host. Symptoms usually appear after the onset of the infection. In many cases, after exposure to an infection, the body becomes immune to that bacterium and second attacks are rare. "Viral templates repeat patterns of alterations and it is believed that immunity, over time, modifies the nature of diseases and the general pattern is to make them less severe."[35] This being the case, a bacterium could be altered enough that immunity from previous exposure is ineffective. This is a possible explanation for subsequent outbreaks in areas previously hit, where one would assume acquired immunity.

There are numerous modes of bacteria transmission. The most common for respiratory diseases is inhalation of droplet nuclei. Expired (exhaled) droplets are liquid particles which get into the air and form an aerosol which is subsequently inhaled by others.[36] Droplets can be carried far distances and therefore may be easily

---

[35]Ethel L.M. Thorpe, The Social Histories of Smallpox and Tuberculosis in Canada: (culture evolution and disease), (Winnipeg, 1989), 4.

[36]Sinnecker, General Epidemiology, 119.

transmitted from person to person; or may fall and be transmitted via food, toys, utensils, or dust (although the concentration in dust is much lower).[87] Closed spaces facilitate aerosol transmission and the bacteria may remain active for many months. The streptococcus Group A bacteria, for example, may be detected on towels for up to four months.[88] "Diseases with aerogenic transmission often occur in epidemic form. The epidemics are frequently explosive in character due to intensity of transmission, sometimes short incubation time and high susceptibility of non-immune persons."[89]

Another of the factors necessary for the spread of a disease is population susceptibility. It is the population susceptibility rather than the susceptibility of the individual which determines change to a mass process.[90] The course of an epidemic depends on the number of susceptibles and contact-rate between susceptibles and infectious individuals.[91] Professor Max von Pettenkofer (1819-1901) of Munich was an early proponent of the idea that there were multiple factors involved in disease causation and spread, and understood the concept of necessity of a susceptible population.[92]

---

[87]Sinnecker, General Epidemiology, 126-127.

[88]Sinnecker, General Epidemiology, 126.

[89]Sinnecker, General Epidemiology, 192-193.

[90]Sinnecker, General Epidemiology, 51.

[91]Bailey, Mathematical Theory, 8.

[92]Paul, Clinical Epidemiology, 28.

There are several commonly accepted notions which accompany the study of susceptibility.

Ethel L.M. Thorpe agrees with the idea that there must be human host susceptibility for infection to occur, but she further contends that there must be a large population to support this. "Thus survival and permanent establishment of the organisms responsible will only occur if the population is large enough to ensure a constant supply of susceptible children and is not so widely dispersed that person to person transmission is difficult."[93] A popular notion which is commonly attached to population susceptibility is the idea of a threshold population "below which an infectious disease becomes naturally self-extinguishing..."[94] Once the population of an area falls below the threshold, and the disease is extinguished, it can only recur by reintroduction from other reservoir areas. "Thus the generalised persistence of disease implies geographical transmission between regions..."[95] To demonstrate the concept of a threshold population, Cliff and Haggett cite the example of measles. In cities over the threshold population there is a continuous trickle of cases which provides a reservoir of infection which sparks an epidemic when the susceptible population reaches a critical level.

---

[93]Thorpe, Social Histories, 8.

[94]A.D. Cliff and P. Haggett, "Epidemic Control and Critical Community Size: Spatial Aspects of Eliminating Communicable Diseases in Human Populations," in R.W. Thomas, ed., Spatial Epidemiology (London, 1990), 97.

[95]Cliff and Haggett, "Epidemic Control," 98.

Measles confers subsequent immunity (like scarlet fever) and therefore the build-up of a susceptible population to critical levels occurs only as children are born, lose mother-conferred immunity, and escape vaccination.[96]

Another concept related to population susceptibility is social distance. With diseases, the spatial distribution is determined by the distance between people, and their relationship density of social distance (average number of meetings per unit of time).[97] "The family is the ideal unit to consider for epidemiological study because common hereditary and environmental conditions exist in a group of individuals, a domiciliary group living in intimate contact with one another..."[98] This intimate contact facilitates the quick spread of illness. Children are also often very active outside the home and are therefore likely to come in contact with disease in their other social relationships. With the spread of disease it seems as though the second attack rate is at its highest if older children are the primary cases. Older children have a greater relationship density with other children because of the groups with which they are involved (school, recreation).[99] "In the group, the social distance is smaller, the contacts more frequent and more intimate than in the larger collective."[100] When

---

[96]Cliff and Haggett, "Epidemic Control," 98.

[97]Sinnecker, General Epidemiology, 90.

[98]Paul, Clinical Epidemiology, 35.

[99]Sinnecker, General Epidemiology, 90.

[100]Sinnecker, General Epidemiology, 90.

people became visibly ill they were generally isolated, but they remained dangerous because of the social relationships between themselves and the care-givers and visitors with whom they had regular contact.[101] A slightly ill patient is even more dangerous because he might not exhibit any symptoms and is therefore not isolated from regular social relationships.

Frequently researchers use several variables when determining susceptibility, four of which are age, sex, race, and class. Overall, age is the most important determinant among personal variables.[102] The elderly are more susceptible because of their degenerated state; and the young are more susceptible because there is little immunity from exposure. Immunity passed on in the fetus only lasts for the first half year, then it wanes.[103] Diseases are also generally more severe with young children.[104] Regarding gender, it is sometimes believed that mortality is higher with men but morbidity is higher with women.[105] This is difficult to prove given the wide variety of diseases. For women, marital status is related to health because of the difference in exposure to sex, pregnancy, child bearing, child rearing, and lactation.[106] There are also differences in sex relating to occupations. There is no

---

[101]Sinnecker, General Epidemiology, 97.

[102]Mausner and Bahn, Epidemiology, 43.

[103]Mausner and Bahn, Epidemiology, 45.

[104]Mausner and Bahn, Epidemiology, 46.

[105]Mausner and Bahn, Epidemiology, 47.

[106]Mausner and Bahn, Epidemiology, 56.

evidence that one race is genetically predisposed to susceptibility.[107] Races can differ only with socio-economic conditions or customs. Social class affects eating habits (nutrition)[108], living conditions, occupation, etc., but information on incomes is often unavailable. Use of these variables is not always valid or accurate.

Reservoirs are primarily responsible for the perseverance of a disease. The organism stays alive by changing host after death or recovery. The host provides a reservoir for the disease, whether disease develops or is just transmitted to another person. "The greatest epidemiological hazards emanate from reservoirs with mild or atypical disease courses."[109] Sinnecker refers to this transfer from one host to another as the endogenous half cycle and he dubs it the "host circle".[110] The host circle creates an infection chain which could hypothetically be infinite.

> The infection chain is a multifactorial system with hosts, causative organisms, transmission processes and environmental effects that leads to the development of diseases through transmission between alternate hosts or transmission of the infective agent from one individual to another.[111]

---

[107]Thorpe, Social Histories, 4.

[108]Thomas McKeown has written numerous essays on the affect of improved nutrition on health and mortality rates. See, for example, The Modern Rise of Population (London, 1976) and "Reasons for the Decline of Mortality in England and Wales During the Nineteenth Century," in M.W. Flinn and T.C. Smout, eds., Essays in Social History (Oxford, 1974), 218-250.

[109]Sinnecker, General Epidemiology, 97.

[110]Sinnecker, General Epidemiology, 23, 51.

[111]Sinnecker, General Epidemiology, 23.

Breakdown of infection chains leads to the extinction of species and therefore the elimination of the disease.[112]

Streptococcus Group A is a zooanthroponoses, which means that it is one of the "human diseases the causative organisms of which became adapted to man in the course of their evolution and can still cause infections in animals."[113] In this instance it is the animals who acted as reservoirs. The infection of animals by infective agents of zooanthroponoses does not necessarily lead to species-preserving.infection chains, but the animals can become an additional reservoir for human infections. In the case of streptococcal infections the dangerous animal is the cow because of the ecological relationships.[114]

While diseases may be spread by intimate contact, on a larger scale transportation begins to play a key role in dissemination. Mass transportation has certainly been a factor in the late nineteenth and twentieth centuries. Mary Elizabeth McInnes stresses the importance of mass transportation (mainly the jet) and immigration to the spread of disease.[115] Enyinnaya Nnochiri's entire book, Textbook of Imported Diseases discusses the importance of tropical and sub-tropical diseases which are transported to the United Kingdom, United States, and Canada via mass transportation

---

[112]Sinnecker, General Epidemiology, 24.

[113]Sinnecker, General Epidemiology, 83.

[114]Sinnecker, General Epidemiology, 83.

[115]McInnes, Essentials of Communicable Disease, chapter 5, 66-68.

routes. Nnochiri emphasizes that diseases are easily transported. In the nineteenth century railways were the prevalent form of transportation. Transportation is also critical for diffusion within a community.

On a smaller scale, single communities can be similarly affected. "Often a whole community existed happily for years without a given infection, and then with the advent of visitors came the introduction of a new infectious agent."[116] Rural areas are sometimes isolated because of a paucity of transportation. In an isolated population there must be an outsider to introduce the disease.[117] Without transportation a population is isolated; therefore transportation brings outsiders, thereby bringing disease. Contact between people is an important factor in transmission, but with some diseases' latency there needs to be re-introduction of the disease to spark an outbreak; and this reintroduction usually comes with transportation.

Population is not static. As the population changes with births, deaths, and migration, the resistance structure also changes. The influx of new susceptibles can prolong an epidemic.[118] In addition, "The interchanges between the suburbs and city due to occupation, school, shopping, visiting relations, leisure outings, etc., here led to the spread of infective disease organisms mainly into districts with large interchanges with the

---

[116]Paul, Clinical Epidemiology, 16.

[117]Paul, Clinical Epidemiology, 136-137.

[118]Paul, Clinical Epidemiology, 91.

city and vice versa."[119] Transportation has undeniably played a large part in the diffusion of illness because it facilitates relocation and expansion of infection.

The final ingredient in this recipe for disease is the environment. A disease can not exist without the proper surroundings. The epidemic development of an infectious disease is based on the infection chain and its promotion by environmental conditions.[120] Seasons are a large part of this. "Seasons of the year are often associated with special social conditions like beginning of school terms, more confined living in winter, etc., by which possibilities for transmission are more or less consistently improved."[121] It is not only the physical environment which facilitates the onslaught of infectious disease. The pathogens themselves are "...subject to a periodicity with favourable and unfavourable living conditions to which they must adjust themselves in vital functions in time."[122]

Diseases of the respiratory tract are more prevalent in winter and early spring, especially from December to March (see Appendices D, E, F, G, H, I). The phases of increase often begin as early as August.[123] Infections of the respiratory tract associated with winter also create a favourable situation for the transmission of

---

[119]Sinnecker, General Epidemiology, 89-90.

[120]Sinnecker, General Epidemiology, 23.

[121]Sinnecker, General Epidemiology, 203.

[122]Sinnecker, General Epidemiology, 204.

[123]Sinnecker, General Epidemiology, 212.

the bacteria in droplet nuclei.[124] Seasonal changes also affect the susceptibility or resistance of host populations.

> Such a seasonal increase occurs, for example, by the activation of latent infections, and consequently takes place mainly with diseases the causative organisms of which frequently give rise to latent infections.[125]

Scarlet fever is one of these diseases. In trying to prove this theory, a group of researchers deliberately infected experimental animals with freeze-dried infective organisms at several different times of the year. The organisms only became active in the winter.[126] The importance of climatic factors in initiating the yearly rhythms of seasonal diseases is generally recognized. What remains a mystery is how the mechanisms of the different seasons activate diseases.[127]

Seasons are inextricably linked to climate. Often epidemics are attributed to the climate rather than the seasons, since it is the climate which varies from one country to another and not always the seasons. "The seasonal suppression or activation of the epidemic process can be due to direct or indirect climatic effects, which influence the reservoir, the process of transmission, the susceptibility and the exposure of populations."[128] Some diseases occur only in certain climatic zones. Whether it is climate which

---

[124]Sinnecker, General Epidemiology, 203.

[125]Sinnecker, General Epidemiology, 210.

[126]Sinnecker, General Epidemiology, 212.

[127]Sinnecker, General Epidemiology, 206.

[128]Sinnecker, General Epidemiology, 203.

is the determining factor of the distribution, or whether certain climates promote changes which are ecologically favourable to certain disease organisms, is not always clear.[129] Ethel L.M. Thorpe adds:

> Some climates vary little throughout the year, and disease organisms adapted to such climates have adjustment periods between summer and winter, or wet and dry seasons, and these ease transitions for ecological systems. Canada, although generally regarded as having a healthy climate, has two major seasons, summer and winter, between which, especially in some areas, are only very brief spring and fall transitions. Seasonal temperature variations are extreme in much of Canada, as often are the differentials between diurnal and nocturnal temperatures, or between one day and the next. A Differential of forty degrees Fahrenheit in a twenty-four hour period is not exceptional.[130]

The fact that bacteria can be affected by variations in the climate indicates a certain volatility of bacteria which are exposed to such changes.

Climate can affect sanitary conditions, and thereby affect infection rates. In very hot weather, sewers, garbage receptacles and even the street can become cess pools, ripe with infective bacteria. Extreme climate or deviations of warmth or cold, of aridity or humidity can affect health by exacerbating the situation.[131] Sanitary reformers in the late nineteenth century fought for better water supplies, slum clearance, better housing, and better labour conditions to combat the filthy, amoral

---

[129]Thorpe, Social Histories, 4-5.

[130]Thorpe, Social Histories, 4-5.

[131]Paul, Clinical Epidemiology, 133.

conditions which they believed fostered disease.[132] The sanitary revolution in the mid-nineteenth century was followed by the rise of bacteriology in the second half,[133] which contributed to a better understanding of the causes of disease. Regardless of theories of disease causation, the efforts of the sanitary reformers did improve living conditions for many people, but not for the reasons they believed. Appropriate medical procedures were adopted without an understanding of why they worked. Treatment for diseases will be examined in Chapter Four.

An understanding of the basic elements of an epidemic is essential to the study of the scarlet fever epidemic in Essex County in 1871. Knowing the intricacies of seasons and climate; modes of transportation of bacteria; the prevalence of reservoirs; the concepts of social distance, threshold populations, and general susceptibility; and a thorough understanding of the parasites responsible for disease will give the researcher a fuller comprehension of the task at hand. Without this knowledge, a study of an epidemic simply could not be undertaken. The field of disease ecology dates back as far as the days of quarantine in the sixth century, and advances made in the field since that time have added a great deal to the understanding of diseases.

From the information presented here, it can be discerned that scarlet fever was a menacing disease. Scarlet fever was a very sensitive infection, with varying immunity, differing virulence and

---

[132]Paul, Clinical Epidemiology, 143.

[133]Bailey, Mathematical Theory, 2.

rapid diffusion. Its effects could be detected years after the initial infection. A lot has changed since the initial observation of rossalia by Ingrassia in 1550. Even since 1871 great strides have been taken in the fields of bacteriology and serology, which have definitely contributed to the diminution of the disease. Unfortunately, even today the disease has not been totally eradicated from society. Scarlet fever is therefore not a disease which should be taken lightly. In 1871 there was an outbreak of scarlet fever in Essex County which claimed many lives. It is this epidemic to which we now turn.

Chapter Three

The Scarlet Fever Epidemic in Essex County

In 1871 there was a severe outbreak of scarlet fever in Essex County. Of all the deaths recorded on the census that year, 22 percent were caused by scarlet fever. The death rate from scarlet fever in Essex County was 3.79 per thousand, which was far above the rates recorded in other areas of Ontario at that time. This high rate justifies the use of the term epidemic. The information about the incidence of scarlet fever in this period is found in the census of 1871. Although it is not a totally reliable source of information, it is the most reliable source extant. Awareness of the pitfalls associated with the use of a census will help to eliminate faulty assumptions and misunderstandings. Population densities, demographic trends, changes to diseases, and transportation play a large role in epidemics and should be discussed for their significance to the epidemic in Essex County. Essex County has a history which has always been inextricably tied to the City of Detroit, and the links between them are numerous. This is one likely source of cross-infection for the spread of scarlet fever. The statistics from the 1870 census of the City of Detroit in Wayne County indicate a similar rate of scarlet fever and support the hypothesis that the epidemic of 1871 was exacerbated by the American neighbour of Essex County.

The Census of Canada for 1871 is the only comprehensive source of data available for the deaths from scarlet fever. From the census all sorts of information can be elicited. The census

provides the figures necessary to calculate the urban and rural geographic densities. Geographic density is a factor in the rate of spread of a disease. Similarly, demographic trends can be elicited from this source. Demographic trends indicate the rate of deaths in general, and are helpful for comparison with the death rate from scarlet fever. While the census yields a plethora of information, caution should be taken when referring to it because the methods for gathering information make the data suspect.

Despite these suspicions, and a possible margin of error, the census remains a comprehensive source of data. It is necessary to utilize the information provided in the manuscript censuses for this study because there is no other source of data regarding scarlet fever in Essex County which is available, or which is reliable. The provincial registry of deaths by local officials was inconsistent and therefore unreliable. There are records of burials available at several local churches. However, they do not appear to be complete compared with the returns of death on the census, and they do not always provide the causes of death. These records cannot be relied upon for eliciting information which can be compared within the county or with other areas. There is also no record available which indicates each person who was stricken with scarlet fever (morbidity), regardless of whether they survived or not. Although the study of morbidity rates can be useful, recording deaths is a more accurate way of determining the frequency of a disease in a large population.[1] Mortality rates,

[1]John R. Paul, Clinical Epidemiology, (Chicago, 1958), 77.

however, give only indirect data on prevalence of morbidity.[2] For these reasons, only those who died from the disease and were duly recorded on the census for that year could be included in this study. One has to take into account a possible margin of error in the data from the census of 1871. But this source is still the most dependable means for determining who was fatally affected.

There were, however, limitations to even this source of information. The primary problem associated with the use of census information is the unreliability of the data. "Opportunities for error present themselves at every step in the complex process of data collection, processing, analysis, and publication."[3] One obstacle to census accuracy was enumerator fallibility and general lack of experience. Some people were overlooked in canvassing because of difficulty in locating atypical housing units or persons with irregular living habits (boarders, apartment dwellers). It was easy to incorrectly list infants born after the official census date (midnight May 31), or omit those who had been alive but who had died before the enumerator's arrival. There could also be errors derived from one respondent reporting information for others in his or a neighbouring household. As well as this, respondents often lied for various reasons.

In addition to these common problems, there were other complications. Sometimes an enumerator would reveal a bias in the

---

[2]Paul, Clinical Epidemiology, 77.

[3]Warren E. Kalbach and Wayne W. McVey. The Demographic Bases of Canadian Society (Toronto, 1971), 7.

under- or over-reporting of information corresponding with what he or she believed to be expected. Sometimes the census takers, for whatever reason, chose to falsify information. Often there was no attempt to keep the spelling of names consistent (the enumerator would guess at a spelling rather than admit ignorance), which made tracing a family from census to census arduous. If there was a language barrier, there was frequently no attempt at accommodation. This was particularly noticeable in the predominantly French areas of Essex County like the township of Sandwich West where a francophone enumerator spelled Sara Chambers, Chambre.[4]

Problems with the collection of data were not confined to enumerator fallibility. There was also a great deal of confusion regarding procedures and definitions arising from a lack of standardization. "One of the greatest difficulties in securing complete, accurate, and comparable death statistics is the fact that physicians very often give statements as to the cause of death which cannot be relied upon for public health purposes. Many terms in common use by physicians have no standing in scientific medical nomenclature."[5] There were difficulties with inaccurate reporting, because physicians occasionally failed to take care with the wording of a diagnosis after the death of a patient, not thinking that it mattered.[6] Problems also arose because sometimes the

---

[4]In Schedule One of the Census the family name is listed as Chambers. Either way, there is a discrepancy.

[5]Earl E. Muntz, Ph.D. Urban Sociology (New York, 1938), 424.

[6]Paul, Clinical Epidemiology, 73.

patient died from numerous afflictions and the primary cause was difficult to ascertain.[7] All of this was compounded by a general inability to accurately identify the cause of death.

In addition to the logistical problems associated with the census, there are also conceptual problems. The problem with area-based approaches is that results are dependent on the given system of areal units (which were administrative) and techniques may fail to detect real clusters which may transgress administrative boundaries. Administrative units are arbitrary and not defined in terms of the population at risk;[8] however, "despite the relation of natural boundaries and climate to occurrence of disease, it is often more convenient to deal with disease statistics by political units since data for these are more readily available."[9] It is therefore advised that the researcher use care. These types of studies also require:

> ...very specific locational information, which will not always be available for reasons of confidentiality. However, when these data are available some method is needed to assess whether case "clustering" is a function of factors other than variations in population density. One way of doing this is to use data on a control population (matched for factors other than the hypothesized 'risk' variable).[10]

---

[7]Paul, Clinical Epidemiology, 74.

[8]P.J. Diggle, A.C. Gatrell and A.A. Lovett, "Modelling the Prevalence of Cancer of the Larynx in Part of Lancashire: A New Methodology for Spatial Epidemiology," in R.W. Thomas, ed., Spatial Epidemiology (London, 1990), 36.

[9]Judith S. Mausner and Anita K. Bahn, Epidemiology: An Introductory Text, (Philadelphia, 1974), 66.

[10]Diggle et al., "Modelling the Prevalence," 36.

The only apparent way to avoid the numerous hazards associated with census use is to constantly be aware of them and take the fallibility of the records into consideration when analyzing data which is derived from censuses.

The census recorded the population of rural and urban areas within each county, as well as the area in acres and the number of houses occupied. This information can be used to calculate the rural and urban population densities of different areas. Density can be defined in several ways. There is the number of people per acre (indicating a contact rate between households), and number of people per dwelling (indicating the contact rate within households). Neither rate is totally reliable, because there are many factors which could affect it. The number of people per acre in rural areas does not take into consideration workers who are in contact with the residents but do not reside there, or the actual distribution of population within that area. The number of people per acre in urban areas does not consider the rates of contact in homes or businesses.

Another type of population density, more often used by sociologists, is that of the number of people per house. Like land population density, there are many factors which affect it. Calculating the number of people per dwelling cannot provide accurate information regarding the number of people per room, but the latter is not provided in the census. While it does indicate the number of people per dwelling, it does not provide such potentially important factors as the size of the dwelling. Given

the greater availability of land in rural areas, it is possible that the houses were larger than they could be in cities, towns, or villages, where land was more scarce. A larger house could mean that an ill person could be effectively isolated from healthy individuals. In the nineteenth century, however, most of the home activity centred around the kitchen and common areas, and isolation was not usually carried out anyway. For this study the only importance that the size of the house could have on the spread of disease was that a larger house could have more people living in it, and therefore more susceptible individuals. At any rate, the census schedules which indicate the size of individual dwellings, and personal income (which could indicate the size of a dwelling) were not linked in any way which might present valid conclusions. From the information which is provided, namely the number of occupied dwellings in rural and urban areas and the population of each area, one can calculate a "crowding index," which indicates the average number of people living in each house, and by inference, the potential cross-infection rate.

It would be misleading to undertake a study such as this without considering the demographic changes occurring. The crude death rate is a figure used to express the number of people dying compared with the total population in a given year. The crude death rate for Canada from 1851 until the turn of the century is given in Table 3.1.

Table 3.1

CRUDE DEATH RATE FOR CANADA, 1851-1901[11]

Year	Crude death rate, '000
1851-61	22
1861-71	21
1871-81	19
1881-91	18
1891-01	16

As the table indicates, between 1851 and 1901 the death rate fell. In 1867 the average life expectancy at birth was forty-two years, and the leading cause of death was infectious disease which led to mortality in infancy, childhood, and early adult life.[12] Life expectancy increased after this period, largely due to a reduction of infectious diseases (including scarlet fever).[13] The most important contribution to improvements in life expectancy were due to decreased infant mortality.[14]

The fertility rate is an expression of the number of live births per year divided by the number of women of child-bearing age in that year. It is more accurate than the birth rate which depicts the number of births compared with the total population, and it therefore indicates the patterns of children being born for

---

[11]Johannes Overbeek. Population and Canadian Society (Toronto, 1980), 34.

[12]Roderic Beaujot. Population Change in Canada: The Challenges of Policy Adaptation (Toronto, 1991), 47.

[13]Beaujot, Population Change in Canada, 49.

[14]Beaujot, Population Change in Canada, 49.

a given year. Since scarlet fever affects mostly children, it is important to consider the number of children being born, as well as their chances for survival. A high fertility rate was seen by Johannes Overbeek as a logical adjustment to the prevailing high uncontrolled death rate.[15] In 1851 the proportion of the population under the age of 15 was 44.9, in 1871 it was 41.6, and by 1891 it was 36.3.[16] The mortality rate decreased and fertility remained relatively high until the late 1870s.[17] As life expectancy increased, women had fewer babies. The decreased fertility after the 1870s was believed to be due to a conscious effort to limit the size of the family.[18] Several suggestions have been made regarding the conscious efforts to limit the size of a family,[19] however speculation as to the motivation for these efforts is beyond the scope of this paper.

The decrease in mortality between 1851-60 and 1891-1900 was attributable almost exclusively to a reduction in the frequency of death from infectious diseases.[20] There has been a debate in history in the last thirty years regarding what effect medicine had

---

[15]Overbeek, Population and Canadian Society, 80.

[16]Beaujot, Population Change in Canada, 206.

[17]Overbeek, Population and Canadian Society, 82.

[18]Overbeek, Population and Canadian Society, 82-3.

[19]Overbeek, Population and Canadian Society, 83.

[20]T. McKeown and R.G. Record, "Reasons for the Decline of Mortality in England and Wales During the Nineteenth Century," in M.W. Flinn and T.C. Smout, eds., Essays in Social History, (Oxford, 1974), 227.

on the decreased mortality rate. One argument regards the conquest of disease and the decrease of mortality between the eighteenth and nineteenth centuries as being due to the advent of medical technology. This version was popular in the 1970s when the success of antibiotics added credibility to such a claim. A new approach headed by Thomas McKeown, professor of social medicine at Birmingham, was that medical intervention had little to do with decreased mortality rates. He pointed out that many of the most devastating diseases had already disappeared before relevant scientific medical innovations occurred. He offered the alternative explanation that lower mortality actually resulted from a decrease in the number of deaths due to infectious diseases and also from a lessening of infant death rate and starvation. McKeown said the decline in mortality from airborne diseases derived from changes in their character and relation of organism to host. The death rate from water-borne and vector-borne diseases was due to sanitary improvements. Until the second quarter of the nineteenth century the decrease in mortality from infections had little to do with specific treatment of individuals.[21] Mortality started to fall before the identification of causal organisms and immunization.[22] He says the biggest catalyst in the decreased mortality rate in the nineteenth century was improved nutrition. He saw public health movement, sanitation, and hygiene improvement,

---

[21]Virginia Berridge, "Health and Medicine," in F.M.L. Thompson, ed., The Cambridge Social History of Britain, 1750-1950, vol. 3, social agencies and institutions, (Cambridge, 1990), 196.

[22]Berridge, "Health and Medicine," 196.

although positive, only as secondary.[23] These comments can relate to 1871 Essex County, where by that time the level of medical knowledge was approximately similar to that in England.[24]

As McKeown stated, one reason for a decrease in mortality in the nineteenth century was fewer deaths from infectious diseases. Scarlet fever, in particular, is believed to have been a large contributing factor to the decrease of deaths from infectious diseases. In Britain, for example, there was a marked decrease in the mortality rate between 1851 and 1891. McKeown and Record state that fewer deaths from tuberculosis, typhus, enteric fever and continued fever, scarlet fever, diarrhoea, dysentery, cholera and smallpox all contributed to this decrease in the mortality rate.[25] From 1851-60 to 1891-1900 there was a substantial decrease in childhood mortality from scarlet fever.[26] G.B. Longstaff examined the trend between 1861-70 and 1876-80 and concluded that the decrease was due to less mortality from typhus and tuberculosis and to a lesser extent scarlet fever, smallpox, diarrhoeal diseases, diphtheria and measles.[27] S. Phillips did a similar study for the period 1851-1905 and emphasized a decrease in mortality from typhus, smallpox, whooping cough, typhoid, scarlet fever,

---

[23]Berridge, "Health and Medicine," 196.

[24]Wendy Mitchinson. The Nature of Their Bodies: Women and Their Doctors in Victorian Canada (Toronto, 1991), 11.

[25]McKeown and Record, "Reasons for Decline," 228.

[26]McKeown and Record, "Reasons for Decline," 231.

[27]McKeown and Record, "Reasons for Decline," 220.

tuberculosis and diphtheria.[28] Fewer deaths from scarlet fever was thought by all these researchers to be a major contributing factor to a decreased death rate in the nineteenth century. Scarlet fever was responsible for approximately 19 percent of the reduction of mortality during the second half of the nineteenth century.[29]

In this context, it is essential to consider what was happening to diseases during this period. It has already been established that there was a decrease in the mortality rate in the nineteenth century. No specific measures of prevention or treatment were available in the nineteenth century (with the exception of vaccination against smallpox which was the only effective procedure in use and was the only therapeutic measure which made any contribution to the control of infectious diseases in the nineteenth century.[30]) Therefore the only possible reasons for the decrease of the mortality rate are environmental improvements or a change in the nature of disease.[31] McKeown and Record conducted an examination of reasons for decreased mortality in nineteenth century Britain. While they looked at several diseases, regarding scarlet fever they stated that it was widely accepted that the most important influence was a change in the nature of scarlet fever due to a reduction of the virulence of the infective organism, or an increase in resistance, or both.

---

[28]McKeown and Record, "Reasons for Decline," 220.

[29]McKeown and Record, "Reasons for Decline," 243.

[30]McKeown and Record, "Reasons for Decline," 222.

[31]McKeown and Record, "Reasons for Decline," 243.

Scarlet fever changed dramatically in short periods of time. Rapidity of change and inconsistence with environmental progress suggest that a variation in virulence and of resistance were important reasons for decrease of scarlet fever as cause of mortality since the third quarter of the nineteenth century.[32] Throughout the nineteenth century scarlet fever was the main cause of childhood death (95 percent of all cases were of children under ten).[33] Between 1861 and 1891 scarlet fever deaths decreased by 81 percent; and it is suggested that this was so because of decreased virulence of the streptococcus bacteria and because of notification and isolation.[34] This decrease was responsible for 19 percent of the total decline of the death rate in the second half of the nineteenth century. While these remarks refer to Britain in particular, the changes in the bacterium itself were universal.

The relationship between an infective organism and host is a changing one which reflects the influence of nature and nurture on both.[35] The stability of the relationship varies considerably between different organisms. It is much more stable in the case of the tubercle bacilli than that of the haemolytic streptococcus.[36] Since scarlet fever was first described by Sydenham in 1676 (when

---

[32]McKeown and Record, "Reasons for Decline," 221.

[33]Berridge, "Health and Medicine," 200.

[34]Berridge, "Health and Medicine," 200.

[35]McKeown and Record, "Reasons for Decline," 235.

[36]McKeown and Record, "Reasons for Decline," 235.

it was a mild disease), it has exhibited at least four cycles of severity followed by a remission.[37] The cycle lasts about 100 years. It was severe in the late eighteenth century, and again in the mid-nineteenth century.

A change in the scarlet fever bacteria was probably due to variation in virulence rather than modification of man's response to it,[38] since the efforts made to control scarlet fever in the 1870s were for the most part ineffective. McKeown says that a decline in fevers (especially typhus and typhoid) was due to a change in the virulence of the bacteria rather than better sewerage and water. His reason for this claim is that the effects of better sewerage and water were not yet felt in the 1870s when typhus was on the decline.[39] Another view initially advanced by McKeown was that perhaps it was better nutrition rather than medical technology which led to improved health in nineteenth century.[40] McKeown said nutrition was the main reason for the decrease of tuberculosis, because neither clinical medicine nor sanitation could account for its decline, and he therefore stressed nutrition. Simon Szreter recently showed that tuberculosis was also affected by poor living

---

[37]McKeown and Record, "Reasons for Decline," 243.

[38]McKeown and Record, "Reasons for Decline," 243.

[39]Berridge, "Health and Medicine," 198.

[40]T. McKeown as cited in Virginia Berridge, "Health and Medicine," in F.M.L. Thompson, ed., The Cambridge Social History of Britain, 1750-1950, vol. 3, Social Agencies and Institutions, (Cambridge, 1990), 174.

conditions and therefore public health was just as important.[41] These debates relate to Britain in the nineteenth century, and therefore are not necessarily directly relevant to the Canadian scene. They do, however, indicate some well-accepted views regarding the links between health and living conditions. It is apparent that scarlet fever (and diseases in general) was affected by environmental conditions as well as the changes to the bacteria itself.

Changes in the virulence of scarlet fever are important to consider since, as we know, the streptococcus bacteria are always present. With changing virulence there are periods when the occurrence will be greater, and the severity and duration of the outbreak can be affected by the frequency of contacts between carriers and susceptibles. Scarlet fever was mild until the 1840s; then the mortality rate doubled until the 1870s when it gradually moderated again.[42] It had reached epidemic status in 1870-1. 1870 was the worst year in London, England.[43]

Despite the trend to a lower mortality rate in Britain and elsewhere, due in part to fewer deaths from scarlet fever, there was still an epidemic in Essex County, Ontario. Essex County was an area which was severely affected by the scarlet fever bacteria in 1871. The history of the area reveals some factors which may have

---

[41]Berridge, "Health and Medicine," 198.

[42]F.B. Smith. The People's Health, 1830-1910 (New York, 1979), 136.

[43]Smith, People's Health, 136.

contributed to the severity of the attack, particulary regarding transportation and the relationship between Detroit and Essex County. Some degree of transportation is a necessary component for the diffusion of disease. The history of the region illustrates the various means of transportation entering Essex County in 1871 which could have been responsible for the outbreak. But it seems as though the transportation between Essex County and Detroit was in fact the main conveyor of the disease.

In the nineteenth century transportation in Essex County was mainly by railways, roads, or water. Once it was decided that the Great Western Railway (GWR) would have a terminus at Windsor, that town was assured predominance over Sandwich and Amherstburg. Anticipation of the railway caused an influx of people and businesses to Windsor. By the end of the 1850s Windsor had greatly expanded. The railway also had the effect of linking Essex County with other parts of Ontario, so that Essex was no more isolated than any other county. On January 17, 1854 the first passenger train (the GWR) arrived in Windsor from Niagara Falls, making winter travel possible. "Without the railway connection with the east progress of the region had been virtually impossible."[44] The Michigan Central Railway (MCR), opened in 1852, and the GWR had a close working arrangement with the MCR. Railways became so much a part of society that railway excursions were planned weekly. Trips were planned from Windsor to Niagara Falls and from Western Ontario

---

[44]Neil F. Morrison, Garden Gateway to Canada: One Hundred Years of Windsor and Essex County, 1854-1954 (Windsor, 1954), 31.

to Windsor. By 1871 the railway was running extensively throughout Ontario.

The significance of this link was that railways could potentially bring diseases into areas serviced by them. Hamilton and Essex County were two areas linked by the railway system. Hamilton, like Essex County, had an epidemic of scarlet fever in 1871. Of 437 deaths listed on the census that year,[15] there were 70 deaths from scarlet fever.[16] This represented a rate of 160 per thousand due to scarlet fever. With this information it could be hypothesized that the railway could have had the effect of introducing the disease. In Essex County this seems unlikely, however, when the pattern of distribution of the cases is studied (see Figure 3.1). The majority of the deaths were centred around the riverfront. While it is true that the railway ran to the riverfront and could possibly have been responsible for the high number of deaths found there, it is also true that there were railway stops throughout the County around which there was not a similarly high incidence of scarlet fever deaths. There were a small number of deaths much further away from the Detroit River, and these could have been from traffic from the railway line which passed not far from the location of the deaths. However it was not

---

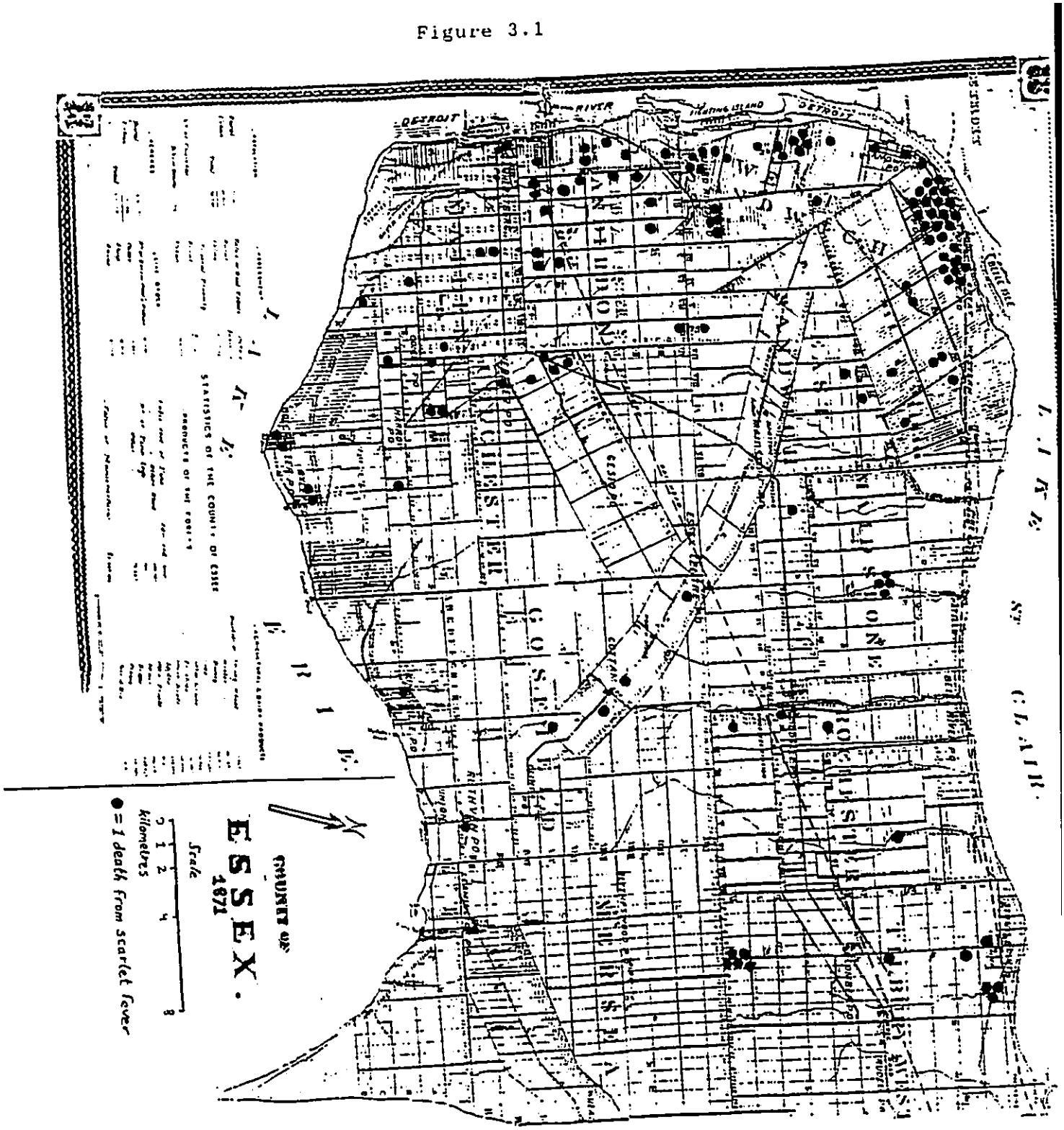
[15]Data from Schedule Two of one of the Census Districts in St. Andrew's Ward is missing.

[16]Manuscript Census of 1871, District No. 24, Hamilton, Province of Ontario, Dominion of Canada. Schedule Two--Nominal Return of Deaths, microfilm # 9926, 9927, and 9928.

a large enough number to prove that the railway was responsible for the severity of the epidemic in Essex County.

Like the railway systems, the road infrastructure was similarly well-developed. From the time of settlement of the County, as roads were surveyed the lands around them were settled. Talbot Road was surveyed in 1818, and it led to settlement in the interior of the county. The same pattern was followed along Middle Road a few years later. Early in the settlement of Essex County there were many rough roads and stage coaches to make travel within the County easier. By 1850 it was possible to travel by stage coach from Detroit to Buffalo in two and a half days. Stage coach travel was limited in volume, however, and the winter made travel impossible for four to five months a year, with the exception of sleighs over short distances. What was more significant was the abundance of inter-county roads which were developing. These roads made it possible for people to travel from more remote parts of the county to the markets in Windsor and in Detroit. They also facilitated the spread of disease from the more densely populated towns to the rural areas. The first three deaths from scarlet fever indicated on the Census of 1871 were close to the Detroit River--two in the Town of Windsor and one in Sandwich East Township. From there the disease spread throughout the county. This pattern of diffusion is visible on the dot map in Figure 3.1. Most striking on this map from the

Figure 3.1


COUNTY OF
ESSEX.
1871
Scale
kilometres
● = 1 death from scarlet fever

perspective of roads were the four deaths which were situated right along Talbot Road, in Gosfield Township, suggesting that the road may have been a factor in the spread.

In the ice-free seasons, the Detroit River also provided a means for transportation. With the growth of Detroit the beginning of ferry service in ice-free seasons was seen in the late 1820s and 1830s. An alternative mode of transportation, which was also initially limited to warm seasons, was steamship service. In the 1850s steamer services connected Detroit and Windsor with ports such as Amherstburg, Toledo, Chatham, Port Huron, and Sarnia. Amherstburg was a busy port--there were also steamers running between there and Chatham, Detroit and Montreal. In those days steamers carried freight and passengers, but only as long as the water routes were ice-free. Steamers ran in conjunction with the GWR from Hamilton to Toronto. There was a steam ferry which provided a cross-river link between the GWR and the MCR, but it was limited to unfrozen seasons and was cumbersome because entire trains had to be unloaded at Windsor, loaded onto the ferry, and then reloaded on an MCR train on the other side. In June 1857 the ferry Union made its first trip across the river. The Union was an ice-breaker, and with its arrival the winter obstacle had been overcome, but the process of loading and unloading the trains was still tedious. In 1867 the iron car ferry was built--the Great Western which was able to transport train cars in their entirety. With the winter obstacle removed, travel between Detroit and Essex County became year-round.

Certainly there was a great amount of shipping traffic along the Detroit River, and this could have been a factor in the epidemic. If this was true, then the pattern of deaths would reflect this, but it did not. It was the young who were most severely stricken. It is possible, of course that the men who worked on the docks brought the infection home but were not affected because of an acquired immunity to the bacteria. If this was the case, there would probably have been some men of working age who were not immune, and the number of deaths for this age group would have been higher. There were only four men aged 15-74 who died from scarlet fever in Essex County in 1871.

Something else which the Detroit River provided was a critical link with Detroit. The close relations between Detroit and Essex County date back as far as the history of the area itself. This area was settled early and was a popular and busy region, owing to the excellent soil conditions and extensive water communication and transportation. 1701 was the year the first permanent settlement was established at Detroit under De La Mothe Cadillac. By 1780 all arable land from present-day Windsor to Lake St. Clair was occupied. Following the end of the American Revolution in 1783 there was a significant influx of United Empire Loyalists into Malden, Colchester and Gosfield. In 1796 the British surrendered Detroit to the Americans. Those loyal to the British crown moved to the Canadian side of the river, to Amherstburg and Sandwich. The land was now divided by a national boundary, but the relationships continued. Owing to the close relationship shared

by residents of both sides of the Detroit River, there were numerous links. As early as the 1850s there were commercial scows crossing the River three times a week. Once the railway and connecting ferries were established in the area, people were able to cross the River for business or pleasure with relative ease. By 1871 there were many people crossing the Detroit River on a daily basis.

Up until the mid-nineteenth century progress in Essex County was slow, due mainly to isolation. There was a difficulty of communication which interfered with settlement and trade. The completion of the Erie and Welland Canals (in 1825 and 1829), and the railways and ice-breaking ferries in the second half of the nineteenth century helped to rectify the situation. It is apparent that despite the geographic isolation from other parts of Ontario early in the nineteenth century, Essex County was well-linked with the United States because of commerce and trade.[47] In addition to the trade contacts, many people worked in Detroit[48] and therefore there was regular contact with the American population throughout the nineteenth century. This constant traffic with Detroit provided the opportunity for susceptible individuals conducting business or pleasure excursions to contract scarlet fever. Aided by the many roads within the County, the disease was spread throughout Essex.

---

[47]Morrison, Garden Gateway, 17-20.

[48]Morrison, Garden Gateway, 20.

Owing to the long history of Essex County, and facilitated by the transportation within the County, there were many towns and villages of varying size and population. As it was recorded in the 1871 census, Essex County was 450 394 acres and was home to 32 697 people. The urban areas--which were the towns of Amherstburg, Sandwich and Windsor--had an area of 4 779 acres, a population of 7 349, and 1 490 occupied dwellings.[49] The rural area which included the townships of Malden, Anderdon, Colchester, Gosfield, Mersea, Peleé, Sandwich West, Sandwich East, Maidstone, Rochester, and Tilbury West, covered 445 615 acres, had 25 348 people, and had 4 546 dwellings.[50] The urban population density was 1537.77 people per thousand acres, compared with the rural population density which was 56.88 people per thousand acres. The number of people per dwelling in the urban areas was 4.93, and the rural rate was 5.58 people per dwelling.

Thus far reference has been made to an epidemic of scarlet fever in Essex County in 1871. The number of people who died from the disease was high enough to justify use of the term epidemic. In 1871 there were 566 deaths in Essex County,[51] the crude death rate being 17.31 per thousand. 124 of the deaths were caused by

---

[49]Census of the Dominion of Canada for the year 1871. (Ottawa, 1871), Volume I; Table I, 2-3.

[50]Census of the Dominion of Canada for the year 1871. (Ottawa, 1871), Volume I; Table I, 2-3.

[51]This figure is calculated from the manuscript census. The published census quotes 585 deaths. There was often a discrepancy between the two accounts. Every effort has been made to be accurate, but errors can occur at any stage.

scarlet fever--approximately 153 per thousand scarlet fever deaths in Ontario,[52] and 219 per thousand deaths in Essex County. Of the 124 deaths, 66 were males and 58 were females. This indicates that gender was not a determining factor for occurrence of the disease. The ages of the victims ranged from under 1 year to 74, however the largest group affected was children under 5 years. (see Appendix A) The age-specific death rate for this group (ages 0-5) was 50 per thousand. The death rate from scarlet fever for the same group was 296 per thousand.

As the figure in Appendix A indicates, children were not the only victims of scarlet fever. In Essex County there were several teenagers and young adults who also succumbed to the disease. Immunity to scarlet fever is dependent upon prior exposure, and these individuals were apparently susceptible, indicating a fluctuation in incidence. Particularly noticeable was the number of young women who died. These women were susceptible to the introduction of the disease into the household as a result of their gender roles. The social impact of the deaths of these women was especially terrible since they were the care-givers and their role was therefore integral to the well-being of the family.

There were 18 deaths from scarlet fever in the town of Windsor, 18 in the township of Sandwich East, 20 in the township of Sandwich West, 19 in the township of Anderdon, and 14 in the

[52]This figure is based on 124 deaths from scarlet fever in Essex County recorded on the manuscript census; and on 808 total scarlet fever deaths in Ontario as recorded in the published census, Table XVIII. There is often a discrepancy between the two and therefore this figure can not be interpreted to be accurate.

township of Colchester. These areas were along well-travelled routes within the County. Conversely, among the areas with the least number of deaths due to scarlet fever were the townships of Maidstone (5), Rochester (4), Gosfield (6), Mersea (0), and Peleé (0). (See Appendix B) These areas were less travelled in relation to the routes between Windsor and points east. The dot map in Figure 3.1 illustrates the degree of diffusion. As the distance from the border increases, the number of cases decreases.

It is apparent that the greater the population, the greater the chance for cross-infection. Consequently, the towns and townships which were more severely affected, were also the areas which tended to have a larger population. Populations for each of the towns and townships in Essex County in 1871 are provided in Table 3.2.

Table 3.2

POPULATIONS OF THE TOWNS AND TOWNSHIPS OF ESSEX COUNTY, 1871[53]

Town/Township	Population
Malden	1 566
Amherstburg (town)	1 936
Anderdon	1 895
Colchester	2 920
Gosfield	2 994
Mersea	3 248
Peleé	150
Sandwich, West	2 228
Sandwich (town)	1 160
Sandwich, East	3 748
Windsor (town)	4 253
Maidstone	2 055
Rochester	2 152
Tilbury, West	2 393

The one glaring exception to this rule was the township of Mersea which had a population of 3 248 and yet suffered no deaths from scarlet fever in 1871. A possible explanation lies in the fact that this township was also one of the largest in acreage and was rural. It was therefore more isolated both in relation to the rest of the townships and within its own boundaries. Regardless of the reason, this merely illustrates the random nature of the disease

The potential for scarlet fever is constantly present, and we also know that existence of cross-infection will likely prolong an outbreak. From the history of Essex County given, it is evident that there were numerous means for transportation, but that

[53]Census of the Dominion of Canada for the year 1871. Volume I; Table I. Ottawa, 1871.

railways and lake shipping were not likely the cause of the outbreak. It is also evident that the roads within the County aided in the spread of the disease.

Moreover, the link with Detroit provided a possible source. In the City of Detroit in Wayne County, Michigan, which is the urban area in which we are interested, there were many deaths from scarlet fever in 1870. Detroit had a population of 79 577 in this year,[54] and 987 deaths.[55] According to the manuscript census for the City of Detroit for 1870 there were 73 deaths from scarlet fever. (See Appendix C) Therefore 74 per thousand deaths were due to scarlet fever. This is not as high an incidence as was seen in Essex County the following year, however this number is for the entire city. In Wards Seven and Ten of the city, two of the wards closest to the Detroit River, (see Figure 3.2) the deaths from scarlet fever were 133 per thousand (8 actual deaths) and 201 per thousand (41 actual deaths) respectively.

It is possible that in 1871 in Detroit there was an epidemic as severe as that in Essex County, but this information is not available. The United States conducted its census in 1870. Due to census information-gathering techniques in the respective countries, there was an overlap of two months between the two. The American census covered the period April 1, 1869 to July 31, 1870,

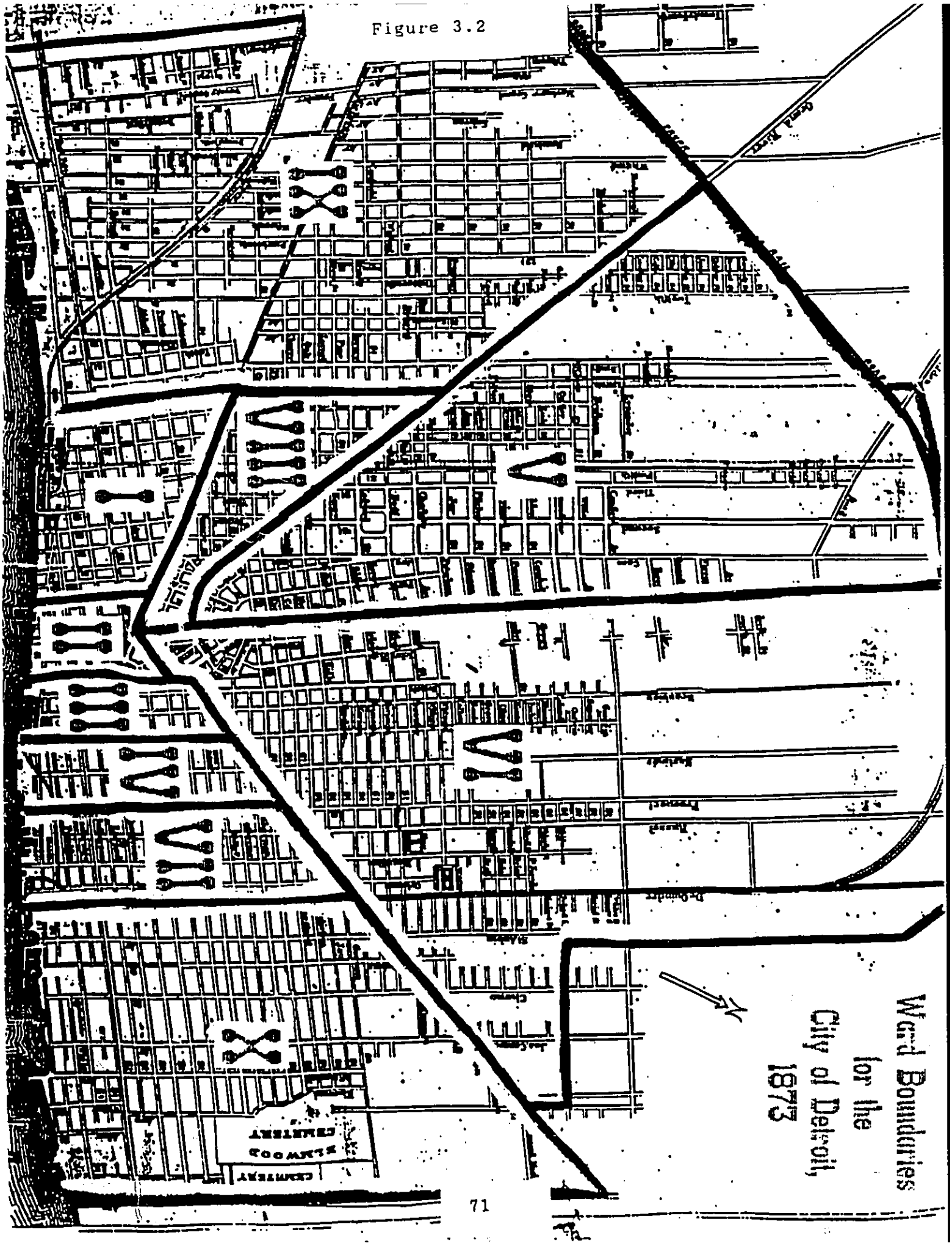
---

[54]Ninth Census of the United States - Statistics of Population. Washington, 1872.

[55]Ninth Census of the United States (Manuscript) Schedule 2--Persons who Died during the Year ending 1st June, 1870 in Wayne County, Michigan.

and the Canadian census covered the period from June 1, 1870 to May 31, 1871. In Detroit in May, June, and July, 1870, there were 18 deaths from scarlet fever, 11 of which were located in Ward Ten, right next to the Detroit River. In Essex County in June, July, and August, 1870, there were 19 deaths from scarlet fever, mostly in the townships of Anderdon and Sandwich East, and in the towns of Windsor and Sandwich--all areas close to Detroit. These deaths could have been linked to the deaths in the same season in Detroit, and they provided a sound base for the epidemic in Essex County which became particulary bad in the colder months. The occurrence of scarlet fever in the summer months in small numbers was not unusual, and the relatively high numbers of deaths in these months in the two areas merely supports the hypothesis that the intermingling between the populations increased the opportunities for exposure and may have increased the impact of the epidemic.

Figure 3.2


Ward Boundaries
for the
City of Detroit,
1873
ELMWOOD
CEMETERY

The close contact between the people of Detroit and Essex County may have increased the impact of the epidemic in Essex County. The history of Essex County is rich with links to the other side of the Detroit River, dating back to the eighteenth century when Detroit was a French fur trading post. It is unlikely that with daily contact between the two areas there would be no cross-infection. There was undeniably a close relationship between the two. With the paucity of transportation links in the early part of the nineteenth century, it is not surprising that Detroit and Essex County would be so interdependent, and that this interdependence would foster an epidemic. There can be no dispute over the fact that scarlet fever made huge contributions to the death rate in the nineteenth century. Given that Essex County suffered one of the most severe outbreaks of scarlet fever, but was not correspondingly one of the most populated areas of the province, mere population density can not explain the cause of the epidemic. One plausible explanation which can not be discounted is the proximity to and contact with Detroit. Chapter Five will present examples of other counties in Ontario to further corroborate this hypothesis.

Essex County was, in many respects, a typical county in 1871. Comparison with other predominantly rural counties indicates the similarities Essex County shared with the others. The one distinguishing factor was the close and regular contact with Detroit. By looking at four other counties we can determine that Essex County was in fact typical, and that some other possible

factors for the outbreak can be discounted because of their failure to produce an epidemic in these other counties.

Chapter Four

Control Groups--Other Counties in Ontario

In order to support the hypothesis that the relationship between Essex County, Ontario and Wayne County, Michigan exacerbated and prolonged the scarlet fever outbreak in 1871, it will be necessary to study some comparative cases. To this end, four other Ontario counties were chosen. I chose the counties of Waterloo North, Bruce South, Simcoe North,[1] and Welland, because each offered a variation of factors similar to and different from Essex County, but none had an epidemic of scarlet fever. There are several variables which interact to bring about an outbreak of a disease. There is no absolute means of determining that one particular variable is responsible for the outbreak;[2] at best one can only determine the most likely causes. Several factors which are related to an epidemic are: poverty, population, pathogens, climate, physical location, and transportation. An area which shared many similarities could have a drastically dissimilar experience with a contagious disease because of different factors. In the case of Essex County the variable which differentiated it from the other counties and which could have been a possible factor in the outbreak and severity of the epidemic was the frequent

---

[1]These counties were not politically divided into north and south regions; however, for the census, these counties were divided, and so in this chapter these divisions are observed.

[2]J.D. Mayer. "Ecological Associative Analysis," in Michael Pacione, ed., Medical Geography: Progress and Prospect (London, 1986), 66-67.

contact between the residents of Essex County and the City of Detroit.

During my research it became necessary to determine the potential of my source of data--the 1871 Census Returns. In Chapter Three the problems of collecting, reporting, and recording census data were discussed. Another important limitation was that there was insufficient data regarding income. Personal income information is critical for determining the standard of living in each area. The standard of living can be an indication of the availability of clean water for drinking and for hygiene, for example, which can be linked to disease causation. Without data regarding personal income, no conclusions can be drawn about the relation (or lack of relation) between disease occurrence and wealth. What can be suggested is that in Table XIII of the Census, occupations are listed in similar proportions by the residents of each county. Barring regional salary differences, this could indicate comparable relative wealth. The proportions of the population employed in each sector from each county are illustrated in Table 4.1. If these similar proportions indicate comparable relative wealth, they cannot be the differentiating factor which caused the outbreak to occur with such severity.

Table 4.1

Percentage Population Employed in Each Sector, by County, 1871

Sctr / Cty	A	B	C	D	E	F
Essex	15.69	2.26	1.37	4.55	0.89	4.73
Waterloo North	10.06	1.29	1.50	6.38	0.93	4.39
Bruce South	16.79	0.72	0.69	3.13	0.55	2.24
Simcoe North	14.50	1.69	1.18	5.09	0.90	4.95
Welland	11.31	3.02	1.85	6.74	1.36	5.13

Sectors:

A=agricultural
B=commercial
C=domestic
D=industrial
E=professional
F=not classified

Another factor associated with the relative wealth of a region was the occurrence of poverty-related diseases. Each of the five counties studied did experience a high incidence of certain diseases thought to be associated with poverty. Waterloo North experienced a significant death rate (102 per thousand) from typhoid fever (see Appendices D and H); Bruce South had a death rate of 79 per thousand from consumption (see Appendices E and I); Simcoe North had a death rate of 83 per thousand due to consumption (see Appendices F and J); and Welland suffered a death rate of 89 per thousand from consumption deaths (see Appendices G and K). Essex County had a death rate of epidemic proportions from scarlet fever, at 219 deaths per thousand (see Appendices A and B). Typhoid fever, consumption and scarlet fever were all diseases thought to be associated predominantly with poverty. While it would certainly be interesting to investigate each of these diseases and the general prevalence of diseases in the nineteenth century, this paper only focuses on scarlet fever. If poverty was the decisive factor in the occurrence of an epidemic, then all areas which were affected by poverty-related diseases could have experienced an epidemic of scarlet fever, but in 1871 the only one of the five counties to suffer was Essex. Regarding relative wealth or poverty-related diseases, poverty can be discounted as a factor in the scarlet fever epidemic of 1871.

In order for an outbreak to occur, there must be a receiving population of sufficient size to provide susceptible individuals. It is a complicated matter to determine the exact size necessary to

support an epidemic; and it is equally difficult to calculate the number of susceptible individuals (non-immune); but in this case it is not crucial. Essex County apparently had the right population size and structure to bring about an epidemic.[3] Regarding population size, some of the control counties were chosen specifically because they had roughly the same population. Essex County had 32,697 people, South Bruce had 31,332, and North Simcoe had 33,719. Since South Bruce had only one death from scarlet fever and North Simcoe had only ten, apparently population size had little bearing on the incidence of scarlet fever.

Regarding population structure, each of the counties was approximately equal to Essex County in age and sex ratios (see Table 4.2). This is a significant factor when considering acquired immunity. A higher incidence of scarlet fever in Essex County might indicate that this area had not had an outbreak for some time. If there had not been an outbreak for a period of a generation (approximately 20 to 30 years), then there would be less acquired immunity. When a person contracts scarlet fever and recovers, that person develops an immunity to that strain of streptococcus bacteria. If a pregnant woman recovers from the disease, the immunity is often conferred to the infant. Each of the five counties had a very similar population distribution, but the victims of scarlet fever in the counties of North Waterloo, South Bruce, North Simcoe, and Welland were within the same age

[3]The definition of an epidemic, as it applies to this study, is given in Chapter Two.

groups as the victims in Essex County (see Appendices A, H, I, J, and K), suggesting an occurrence pattern similar to Essex County.

Each county also had roughly the same proportion of people living in rural and urban areas. Essex County had 22.48 percent of its population living in urban areas (defined as cities, towns, and villages). In comparison, North Waterloo had 22.52 percent, North Simcoe had 22.39 percent, and Welland had 34.51 percent. Since these four counties were roughly equal in the rural-urban population distribution, and since only Essex experienced a scarlet fever epidemic, it is logical to assume that this distribution was not linked to the outbreak.

Table 4.2

Age Distribution of the Population of the Counties of Essex, North Waterloo, South Bruce, North Simcoe, and Welland, 1871

COUNTY / AGE	ESSEX COUNTY		NORTH WATERLOO COUNTY		SOUTH BRUCE COUNTY		NORTH SIMCOE COUNTY		WELLAND COUNTY	
SEX	%M	%F	%M	%F	%M	%F	%M	%F	%M	%F
0-1	3.19	3.38	3.23	3.32	3.27	3.57	3.28	3.55	2.78	2.80
2-6	15.06	15.35	15.98	16.01	16.27	17.65	15.16	16.42	13.57	13.44
7-11	13.94	14.89	15.38	15.42	17.01	17.03	14.57	15.16	13.32	12.81
12-16	12.46	12.57	13.54	13.71	13.24	13.77	12.47	12.42	12.46	12.70
17-21	9.53	10.21	10.89	11.32	9.14	9.91	10.04	10.86	9.89	10.68
22-31	15.50	16.50	13.03	14.17	13.11	14.06	17.28	17.34	14.81	16.37
32-41	11.11	11.02	9.06	9.32	11.21	10.49	11.17	10.64	11.47	11.84
42-51	8.30	7.46	8.14	7.75	8.07	6.42	7.14	6.56	9.62	8.74
52-61	5.55	4.53	6.03	5.03	4.79	3.78	4.82	3.83	6.44	5.24
62-71	3.60	2.86	3.19	2.68	2.47	2.29	2.76	2.06	3.77	3.30
72-81	1.41	1.00	1.23	1.01	1.10	0.74	0.97	0.90	1.49	1.49
82-9	0.30	0.25	0.23	0.25	0.20	0.17	0.28	0.19	0.30	0.33
92-100	0.04	0.02	0.03	0.01	0.04	0.02	0.02	0.04	0.03	0.03
over 100	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00
not given	0.01	0.01	0.03	0.02	0.09	0.08	0.05	0.03	0.06	0.22

Another variable related to population is population density. Density in its various forms was defined in Chapter Three. It is a very complicated matter to consider all the factors involved in population density, but on a very basic level, based on the calculation of number of people in rural areas divided by the number of acres and on the number of people in urban areas divided by acres, several of the control counties had similar rates. In Essex County there were 25 348 people living in rural areas, and 445 615 acres. This translated into a land population density of 0.06 people per acre. In Waterloo North the rural land population density was 0.09; in Bruce South it was 0.07; in Simcoe North it was 0.04; and in Welland it was 0.09 people per acre. There was very little difference between them. Geographers often take into consideration the condition of the land, that is they observe whether it is improved acreage, or total acreage. In this study the use of the land is not as important, because we are looking strictly at the distance between households.

In the combined urban areas of Essex County there was a population of 7 349 which lived on 4 779 acres. The urban land population density for Essex was 1.53 people per acre. Again, it was similar to the same densities of Simcoe North (1.07) and Welland (1.25). Waterloo North and Bruce South both had considerably smaller urban land population densities of 0.73 and 0.71 people per acre, but these figures still indicated a high rate of contact between residents. In both rural and urban areas in Essex County there was apparently enough contact between the

residents of the houses to facilitate the spread of scarlet fever. Since the other four counties had similar land population densities (especially Welland County), but dissimilar rates of scarlet fever, (even of the diseases which did affect these areas, the rates were not as high) this type of population density cannot be associated with the epidemic.

Population density based on the number of people per dwelling (crowding index) is another indication of potential contact rates between infected individuals. In rural Essex County the crowding index was 5.58, compared with 5.94 for Waterloo North, 6.00 for Bruce South, 5.92 for Simcoe North, and 5.30 for Welland. In urban areas of the same counties the rates were 4.93, 6.11, 5.63, 5.73, and 5.40, respectively. There was little difference between rural and urban areas, and we can not ascertain the size of the dwellings from the data available. All we are concerned with here is the number of people living under the same roof who could potentially be in daily contact with one another. Even if there was isolation of sick patients, the care-giver could carry the bacteria from the patient to the healthy co-inhabitants. Since the crowding index was roughly equal in each county (being approximately 5-6 people per dwelling in both rural and urban areas), this, too, must be discounted as the propagator of scarlet fever, since Essex was the only county of the five which experienced an epidemic of this disease.

Pathogens are listed as being a factor in epidemics by Mayer. Since pathogens, the group A haemolytic streptococci in the case of scarlet fever, are necessary for the outbreak of even one case of

a disease, they can not be discounted; but they do not act alone. In comparing the epidemic area, Essex County, with the control areas, Waterloo North, Bruce South, Simcoe North and Welland, we could analyze the differences with the bacteria in each region. We already know that the streptococci can vary in severity from decade to decade, and that this accounts for the outbreak reaching epidemic proportions in different eras, while remaining minimal in others. It is possible that there was more than one strain of the bacterium circulating at the same time. However, since there was an epidemic in the same decade in England, various areas of the United States, the City of Detroit, Michigan, and Essex County, and since scarlet fever was endemic in Ontario at the time, it is highly unlikely that Essex County was the only region in Ontario visited by this more severe strain. The other counties could have been exposed to the same strain, but different factors prevented an epidemic. In North Waterloo County there were 206 deaths in 1871. Only four of these deaths were due to scarlet fever (see Appendix D). South Bruce County had 215 deaths,[4] but only one was from scarlet fever (see Appendix E). In North Simcoe County there were 339 deaths,[5] and only ten were due to scarlet fever (see Appendix F). In Welland there were three scarlet fever deaths compared with

[4]This figure is derived from the manuscript census, not the published census which indicates only 214 deaths.

[5]This figure comes from the manuscript census, not the published census which indicates 340 deaths.

225 deaths from all causes[6] (see Appendix G). What is more likely than a variation in the severity of the bacteria is that another factor, acting in conjunction with the pathogen, was absent in the control counties, but present in Essex County.

Mayer also states that climate can be a factor in an epidemic. Essex County is more southerly than any of the other four counties (see Appendix L), and is well-known for its temperate climate. Each of the counties studied here, however, had approximately the same mean temperatures for January, 1872 (the month and year for which there is the most complete data)[7]. Scarlet fever is a disease which is more prevalent in the winter months, and the statistics support this (see Appendices B, C, D, E, F, and G). North Simcoe had ten deaths from scarlet fever, while Waterloo North, Bruce South, and Welland had only four, one, and three cases, each, resulting in death. These areas had a mean temperature of -4.1, -7.5, -6.1, and -6.2 celsius degrees in January, 1872[8] respectively, but no epidemic. Essex County had a

---

[6]There is a discrepancy of 20 deaths between this figure calculated from the manuscript census, and the published census which indicates 245 deaths for the same year. The figures from the manuscript census were very carefully checked, but errors can occur at several stages of the process, from reporting in 1871 to calculating in 1993. These twenty deaths are unaccounted for.

[7]Weather Station data from Stations #6122845, 6137735, 6139520, 6149625, and 6158350, from the Climate Information Branch of Environment Canada, Downsview, Ontario.

[8]Weather Station data from Stations #6137735, 6149625, 6122845, and 6158350, from the Climate Information Branch of Environment Canada, Downsview, Ontario.

mean temperature of -5.1 celsius degrees in January, 1872[9], and did have an epidemic. The months of the scarlet fever deaths in each county are illustrated in Table 4.2. What each of the five counties had in common was that they were located in a country which does have a winter season, when most of the deaths occurred. Since only Essex County had an epidemic, climate could not have been the determining factor for the outbreak.

Table 4.3

SCARLET FEVER DEATHS, BY MONTH AND COUNTY, ACCORDING TO THE 1871 CENSUS

MO / CTY	JUN '70	JUL '70	AUG '70	SEP '70	OCT '70	NOV '70	DEC '70	JAN '71	FEB '71	MAR '71	APR '71	MAY '71
ESS	4	8	7	11	11	9	11	22	25	6	6	4
WAT	0	1	0	0	0	0	0	0	2	1	0	0
BRU	0	0	1	0	0	0	0	0	0	0	0	0
SIM	0	1	1	0	1	1	1	2	1	0	0	2
WEL	0	0	0	0	0	0	0	0	0	0	0	3

ESS=Essex County
WAT=North Waterloo County
BRU=South Bruce County
SIM=North Simcoe County
WEL=Welland County

The physical location of a county can play a role in the spread of contagious disease. The more contact an area has with outside regions, the greater are the number of potential disease

[9]Weather Station data from Station #6139520, from the Climate Information Branch of Environment Canada, Downsview, Ontario.

transmitting connections between people. None of the five counties studied was completely isolated in 1871. For an illustration of the location of some of the areas discussed, see Appendix M. Waterloo North was settled during the American War of Independence by German Mennonites, and by 1871 several industries had established themselves in the town of Berlin and other areas in the county. Waterloo had close trading ties to Preston and Dundas. Bruce South was settled in the early 1850s and was in regular contact with the towns of Goderich and Southampton, and with markets to the south and east. Simcoe North was relatively more isolated than Waterloo North and Bruce South, but had close commercial ties with Toronto. Settlement in Simcoe County began in the first decades of the nineteenth century. Like Waterloo County, Welland was settled during the American War of Independence.[10] Welland was a hub of commercial activity, owing largely to the Canal. This gave it many contacts with several areas throughout the province (like London, Hamilton, and Toronto), as it was one of the chief links to American markets. In 1871 Essex County, like North Simcoe, was somewhat isolated relative to the rest of the province, but it did have some contact with London and Toronto, and it had a great deal of trading contact with Michigan. Therefore, while the contact with other regions may not have been as extensive as other regions, Essex County was not completely isolated and there was sufficient contact to potentially spread disease. As

[10]United Empire Loyalists were rewarded by the Crown for their fidelity by grants of land in the Niagara District, of which Welland County was a part.

illustrated in Chapter Three, however, the railway and roads into Essex County from other parts of Ontario were not likely responsible for bringing scarlet fever into the County.

The final factor to be discussed is transportation. Transportation is the primary means by which a disease is diffused, and is therefore particularly important. If a community is completely isolated it is unlikely that a member of that community will contract a communicable disease without its introduction by an outside agent. None of the five counties studied was isolated in such a way as to make disease transmission impossible. A well-integrated system of roads, railways, and water routes connected cities, towns, and villages within counties, and connected each county with other counties in Ontario in 1871, for manufacturing, commercial farming, and for general travel. Roads were the primary means of transportation before other routes were established. Invariably roads began as paths used by horses, wagons, or stagecoaches, and settlements often arose based on their presence. In Waterloo County roads were abundant. Despite the lack of water routes to travel, transportation was easy because of the numerous gravel roads and stagecoach services in the county. In 1835 a public stagecoach service to Preston via Waterloo and Berlin was established, and was followed by others and by road improvements to aid the stagecoaches. During the 1850s Wellesley and Woolwich Townships laid gravel roads to Berlin in order to benefit from the prospective railway. By 1857 there were nine well-established

stagecoach services transporting travellers; some daily; some connecting with the Great Western Railway at Galt.[11]

In the 1840s there were several petitions to the Crown to have the land known as Queen's Bush (Bruce County) surveyed and thereby opened for settlement. The demands increased as waves of immigration pushed up Canada's population. In 1847 the Crown acceded to the requests and passed an Order-In-Council to allow for surveyance. In order to attract prospective settlers the government opened a colonization road from Simcoe County to the mouth of the Penetangore River on Lake Huron, and offered a free grant to settlers of a fifty acre farm lot on a concession intersecting with this road (the Durham Road). In the early years travel in this newly-cleared area was primarily carried out on sleighs--either on snow in the winter or in the mud in the warm months. Between 1850 and 1880 the dense forest of Bruce County was cleared and replaced with cultivated farms, centres of commerce, and manufacturing industries. A network of gravel roads appeared. By 1867 much of the work of graveling the leading roads and on harbours at Kincardine, Inverhuron, and Southampton was completed. By 1871, barely twenty years after the initial settlement, after record-breaking migration into the area to create a sound

---

[11]For more information on the development of transportation in Waterloo County, see Gottlieb Leibrandt, Little Paradise: The Saga of the German Canadians of Waterloo County, Ontario, 1800-1975 (Kitchener, 1980); and Paul Tiessen, ed., Berlin, Canada: A Self-Portrait of Kitchener, Ontario Before World War One (St. Jacobs, n.d.).

population base, there was an extensive road system, linking South Bruce with regions to the east and south.[12]

In Simcoe County roads began as trade routes from Hudson Bay (Georgian Bay) to trading posts in Simcoe County and York. Beginning in 1798 land was purchased by the Crown from the Indians in order to open a road for the fur traders. Even before settlement, there were many rough roads in existence because of the trade routes. By 1840 a multitude of colonization roads had been constructed throughout the county. These roads were the responsibility of the Legislature of Upper Canada. From 1843-1849 several other roads were constructed under order of the District Council. Likewise, many other roads and bridges were constructed by individual townships in the ensuing years. Stagecoach services were abundant. Mail stages ran three times daily from Toronto to connect with the steamships on Lake Simcoe. There were also a multitude of stages carrying passengers which could take a person to almost any destination he or she desired in the County, or in surrounding areas. As a result of the early fur trading routes, and because of the steady stream of incoming settlers, there existed a considerable road system throughout the county.[13]

---

[12]For more information regarding the development of transportation in Bruce County, see Laura M. Gateman, Echoes of Bruce County (the Land of Beef and Beaches) (St. Jacobs, 1982); and Norman Robertson, The History of the County of Bruce and of the Minor Municipalities Therein (1906).

[13]More information regarding the development of transportation can be found in W.W. Fieguth, The Personality of North Simcoe County: A Study in Historical Geography (London, 1968); and Andrew F. Hunter, A History of Simcoe County (Barrie, 1909).

In Welland County roads were constructed at a rate paralleling the settlement of the county. There were many roads which connected Welland with London, Berlin, Hamilton, Toronto, and other commercial centres. A multitude of stagecoaches ran services along these roads, bringing mail and passengers to almost any destination. Once the canal was constructed, more roads were established or improved to increase the utility of the canal.[14]

Similar to Simcoe County, Essex County also had a history of settlement based on trading routes. Before settlement Indian trails criss-crossed the county at numerous places which have become major thoroughfares in present-day Essex County. As we have seen in Chapter Three, as roads were surveyed, the land around them was settled. Early in the settlement of Essex County there were many rough roads and stagecoaches to make travel within the County easier. As stated above, by 1850 it was possible to travel by stagecoach from Detroit to Buffalo in two and a half days. Stagecoach travel was limited in volume and the winter made travel impossible for four to five months a year. The use of sleighs, however, often made winter travel easier than travel at other times of the year. The extent of roads in Essex County was no different from any other county in Ontario in 1871. But, while roads were abundant, their utility as a mode of travel was limited by the winter season.

---

[14]More information regarding the development of transportation in Welland County can be found in John Burtniak, The History of the County of Welland, Ontario, Its Past and Present (Welland, 1987).

Railways were not as encumbered by winter travel.[15] The Canadian Pacific Railway has a very significant place in the history of settlement in Canada. The same is true of the branch lines of railroads in various regions of Ontario. In 1856 the Grand Trunk Railway (GTR) was completed through Waterloo County. It linked Berlin in North Waterloo County with Sarnia and Toronto. Passenger service twice a day began July 1, 1856.

In 1858 the first railroad in Bruce County was opened between Goderich and the village of Kincardine. In 1871 the Wellington, Grey and Bruce Railroad was nearly completed, with a terminus at Southampton and a promise of a branch to connect Kincardine, and the first locomotive steamed into Southampton. In December of 1872 the line was complete. By 1880 there were four railways linking farmers and manufacturers with markets. At the time of the scarlet fever epidemic in Essex County there was only one small railway in Bruce County.

Early in the history of Simcoe County the settlers began to agitate for a railway across the isthmus from Toronto to Georgian Bay. To meet the demand, the Northern Railway was completed in sections: to Aurora May 16, 1853; to Bradford June 15, 1853; to Barrie October 11, 1853; and to Collingwood January 1, 1855. In 1869 it was extended to Orillia. By 1871 this was the extent of transportation in Simcoe County. When the Northern Railway reached

---

[15]More information concerning transportation in Essex County is available in Neil F. Morrison, Garden Gateway to Canada: One Hundred Years of Windsor and Essex County, 1854-1954 (Windsor, 1954).

Barrie in 1853, some of the steamships ran a connecting service with the train depot. By 1855 the Northern Railway was running throughout the county and connected the area with Toronto and other areas to the south.

Welland County had numerous railways running through the area to increase the utility of the Canal in the 1870s. At the head of the Canal was the junction of the Buffalo and Lake Huron Railroad and the Welland Railway. The Welland Division of the GTR ran parallel with the Canal and had eight stations within the borders of the county. During the summer the GTR connected with steamers at Port Dalhousie for Toronto, Montreal and other eastern points. The Great Western Division of the GTR (from the suspension bridge on the Welland River to Windsor) crossed the northern portion of the county, connecting with the Welland Division and it facilitated communication with Hamilton, London, Toronto, and ports in the United States. The Buffalo and Lake Huron Branch of the GTR ran through the southern part of the county, connecting with the Welland Division at Port Colborne and making communication with all principal points in Canada and the United States. The Michigan Central Railway (MCR) ran through the county from west to east and crossed the Niagara River at Fort Erie. There was also a freight line--the Air Line Branch of the GTR which traversed the county parallel with the MCR and linked Allenburgh and Niagara Falls at two junctions.

Bruce County had very few railways, and Welland County had an inordinate amount of them. Waterloo County, Simcoe County and

Essex County were all in the middle range for the amount of railway links. As stated above, on January 17, 1854 the first passenger train, the Great Western Railway, (the GWR) rolled into Windsor from Niagara Falls. The GWR did a substantial amount of business. Steamers ran in conjunction with the GWR from Hamilton to Toronto, and train excursions became popular. The Michigan Central Railway (MCR), opened in 1852, and the GWR and the MCR had a close working arrangement. Railways traversed many of the counties of Ontario in 1871, making transportation within and between them effortless.

In some counties, railways were not the only means of transportation. Ontario's topography is marked by many rivers and lakes. These waterways were often an integral part of the transportation systems for trade, commerce, and general travel by individuals. Waterloo County was the only one of the five counties which was landlocked. The County of Bruce is located on the shores of Lake Huron. The proximity to Lake Huron meant there were ports in several of the villages located on the water, and steam ships regularly passed through the area.

North Simcoe County lies between Georgian Bay and Lake Simcoe. Simcoe County was settled because of the trade routes established by the fur traders who travelled across Hudson Bay into Georgian Bay and then across land (Simcoe County) to the fur trading posts. The fur traders found the route through Simcoe County by canoe was faster and cheaper than sailing vessels taking the circuitous route from Lake Huron (Georgian Bay) to York. After settlement of the county by refugees from Lord Selkirk's Red River Settlement, the

profusion of waterways made water travel a popular option. Starting in 1831 the steamboat Sir John Colborne began regular trips around Lake Simcoe. In 1834 it was replaced by the Peter Robinson which was able to extend the journey by passing through the Narrows; and it included stops at Holland Landing, Barrie, Oro, Georgina, and Thoriah on the way to the Narrows. In 1839 it was re-christened The Simcoe. Over the years other ships and ports were added to travel on Lakes Simcoe and Couchiching. When the Northern Railway reached Barrie in 1853, some of the vessels ran a connecting service with the train depot. Also beginning in the 1830s there was steamship service in Georgian Bay between Penetanguishene and Coldwater, Port Powell and Collingwood. The Northern Railway was completed to Collingwood on January 1, 1855, where the first regular line of steamboats in connection with the railway began in 1857.

Welland County is bordered on the east by the Niagara River and on the south by Lake Erie. Welland County was perhaps most noted for the Welland Canal. In the summer of 1818 an enterprising young man--William Hamilton Merritt--undertook a private survey to determine the feasibility of connecting the Welland River to the Twelve Mile Creek which emptied into Lake Ontario. Merritt's motive was to increase the supply of water for his milling business at Shipman's Corners (now St. Catharines). A number of obstacles prevented completion of the project, deemed favourable by the Government, and it was not until November 30, 1824 that sod was first turned for the construction of the Welland Canal. Exactly

five years later the schooners Annie and Jane of Toronto, and R.H. Boughton of Youngstown, New York, passed through the canal. In 1842 the Government of Upper Canada purchased the stock of the Welland Canal Company and assumed entire control. Extensive improvements were made. In 1870 improvements were again undertaken--the canal itself was enlarged and twenty-five new lock lifts were installed. This renovation extended well into the mid-1880s. At the time they expected the canal, when completed, would carry 60 000 bushels of wheat a year and would be a great artery of commerce.[16] In fact, the Welland Canal became so important that in 1865 the marauding Fenians regarded it as a prime target for raids in order to impede commerce and prevent the passage of war and other vessels from lake to lake.[17] The ideal location of the County on the waterway gave the settlers the opportunity to take advantage of the mode of travel. In 1829 the Welland Canal was completed and it provided the people of Welland with a vital trade link to the American population. Welland County is the only county other than Essex County studied here which had any direct communication with the American population. But even this link was only an indirect one, because while there was definitely traffic on the Welland Canal, there was not an American city directly across the border with whom the people of Welland County could have regular contact. It was the direct proximity to a large population base which created personal contacts, not the potential danger

[16]Burtniak, History of Welland, 120.

[17]Burtniak, History of Welland, 127.

created by the vessels passing through the canal with which we are concerned.

Essex County is located between Lakes Erie and St. Clair. These lakes are connected by the Detroit River which was very important to transportation in Essex County. With the growth of the City of Detroit the beginning of ferry service in ice-free seasons was seen in the late 1820s and 1830s. An alternative mode of transportation, which was also limited to warm seasons, was steamship service. . In the 1850s steamer services connected Detroit and Windsor with ports such as Amherstburg, Toledo, Chatham, Port Huron, and Sarnia. Amherstburg was a busy port--there were also steamers running between here and Chatham, Detroit and Montreal. In those days steamers carried freight and passengers, but only as long as the water routes were ice-free. There was also a steam ferry which provided a cross-river link between the Michigan Central Railway and the Great Western Railway, but it was limited to unfrozen seasons. As stated, in June 1857 the ferry Union made its first trip across the river. The Union was an ice-breaker, and therefore the winter obstacle had been overcome.

The counties of Waterloo, Bruce, Simcoe, Welland, and Essex all had extensive road systems, railways, and water routes in place in 1871, making transportation within and between them fairly easy. We know that transportation is necessary to transmit diseases, and it is a possible culprit for the diffusion of scarlet fever. But Essex County was the only one of the five which had an epidemic.

Therefore, although transportation did play a role in the spread of scarlet fever, it was not the only promoter of the epidemic.

The one factor which was not found in Waterloo North, Bruce South, Simcoe North or Welland, but which figured prominently in Essex, was a direct, daily, and regular transportation link with Detroit. The City of Detroit in Wayne County, Michigan, and Essex County, Ontario had regular contacts between them, via the Detroit River. This, being the only factor present in Essex County which was absent in the control counties, and which is one means for the diffusion of disease, must be considered the important factor in the scarlet fever epidemic in Essex County in 1871.

After analyzing the Nominal Return of Deaths from the 1871 Census, it is apparent that there were far more deaths from scarlet fever in Essex county than in any of the other counties studied here. Since the counties are all comparable in terms of wealth, population, pathogens, climate, physical location, and transportation, one must look for other factors which are different in order to understand the discrepancy. One explanation which seems evident is the amount of direct, daily and regular contact with a large urban area to increase chances of cross-infection in Essex County. It has already been demonstrated that the bacterium which causes scarlet fever is harboured in the throats of one in three people, and that scarlet fever was endemic in North America in the mid-nineteenth century. Therefore while transportation was responsible for facilitating the spread, it was the direct, daily and regular contact with Detroit which must logically be seen as

responsible for the activation of the disease, and for its flourishing to epidemic proportions in Essex County in 1871.

With all this in mind, it will be useful to now turn to a discussion of the social setting within which the epidemic occurred. Chapter Five details the intellectual and emotional climates so as to place the information presented here into context.

Chapter Five

The Social Context of the Epidemic

The occurrence of scarlet fever, which was very widespread in the 1870s, must be studied in the social context of Essex County. The circumstances which are significant to this study are the conditions relating to housing, milk supplies, and urbanization. Since scarlet fever predominantly affected children, this age group deserves further analysis. Peoples' perceptions of death and illness played a large part in how they reacted to disease. Scarlet fever was not given the same attention which cholera and smallpox had received in the past, and by briefly looking at the reactions to cholera and smallpox one can elicit a possible explanation for this disparity. An area which is particularly important is the medical knowledge in the mid- to late-nineteenth century. There were several options available to people wishing to seek medical advice, and by looking closely at some of the main medical schools of thought, one can explain the reason for the frequent inaction or apathy in the case of illness. In a larger context, scarlet fever must be comprehended according to the theories of the day. Sanitary reform was an idea which was popular amongst medical practitioners and other health activists; and it was believed to be the means to eradicate disease. Throughout this period there was an evolution of theories about disease and health, championed by many well-noted men in various fields, which began as the sanitary idea was replaced by the germ theory and led to the public health movement. The conditions, perceptions, and theories

presented here represent a progression of interconnected concepts which resulted in the government response (or in this case lack of response). This information presents the context for understanding the scarlet fever epidemic.

There were many circumstances which contributed to the severity of the scarlet fever epidemic in Essex County and made it difficult to control. Paramount among these are housing and living conditions, milk, and urban conditions. Homes were particularly perilous. Families tended to gather in the common areas of the house which were the centres of activity. Harsh winter conditions experienced in Essex County, as elsewhere, forced the pre-school aged children to stay inside, and the mothers were also confined indoors for child-minding and household chores. There was also increased school attendance of older boys during the winter months which could have been another means for introducing disease into a home.[1] Only the father and other working family members left the house for extended periods of time when they went to work. These conditions greatly increased the chances of becoming sick.

It was also difficult to remain healthy when the food consumed was hazardous to one's health. Before pasteurization became widely used, milk caused many health problems. Because of its constitution, milk provides a good medium for the growth of bacteria from soil, manure, and from diseased men and animals. In

---

[1]Chad Gaffield studied Prescott County to make generalizations about Ontario, which could be applied to Essex County. For more on this topic see Chad Gaffield. "Schooling, the Economy, and Rural Society in Nineteenth-Century Ontario," in Joy Parr, ed., Childhood and Family in Canadian History (Toronto, 1982), 69-92.

addition, milk churns were regularly left uncovered and exposed to the flies from the stables. Once introduced, bacteria in milk multiply rapidly. Some of the chief milk-borne diseases were tuberculosis, typhoid fever, septic sore throat, diphtheria, and scarlet fever. British researchers linked outbreaks of scarlet fever and typhoid to infected milk by the 1880s.[2] In rural Essex County milk came from the families' own cows, and between the cow and consumption of the milk there were numerous opportunities for the transfer of bacteria. In the urban areas milk would come from common markets, if purchased at all, thereby creating an additional opportunity for infection.

The environment in which people lived had a great effect on their health as well. In the nineteenth century there was an increase in the number of people leaving the rural areas to live and work in the cities. In 1871 22.5 percent of the residents of Essex County lived in urban areas. Urban life was more dangerous because of increased exposure to unsanitary areas; but some rural areas were just as dangerous.[3] Furthermore, more frequent contact between people usually created favourable conditions for disease. "The concentration of population to an ever-increasing degree in the cities provides contacts which facilitate the rapid spread of

---

[2]Heather MacDougall, Activists and Advocates: Toronto's Health Department, 1883-1983 (Toronto, 1990), 98.

[3]Michael Anderson, "The Social Implications of Demographic Change," in F.M.L. Thompson, ed., The Cambridge Social History of Britain, 1750-1950, vol. 2, People and their Environment, (Cambridge, 1990), 20.

communicable diseases."[4] In Essex County it was primarily the potential for cross-infection created by a higher population density which made the towns more dangerous. The high incidence of scarlet fever in towns like Windsor would seem to confirm this fact.

Living conditions, milk, and urbanization all contributed to the severity of an epidemic of scarlet fever, and due to the nature of the disease, it was children who were most severely affected. Of all the people who died from scarlet fever in 1871 in Essex County, 40.2 percent were under the age of fifteen years (see Appendix A). The attitudes toward children could possibly have patterned the responses to illness in children. Children were more susceptible because of lack of immunity and as a result of social circumstances like crowded school houses and homes which aided in the spread of scarlet fever.

The response to a disease which affected predominantly children was conditioned by the prevalent attitudes toward children in the mid-nineteenth century. Children were more like second-class citizens. An adult was a person, but children were not actually persons; they were partially formed and potential adults.[5] Neil Sutherland draws four conclusions about the attitude toward children in English Canada in the 1870s: 1) English Canadians showed little awareness of children as individual persons; 2) they

---

[4]Earl E. Muntz, Urban Sociology (New York, 1938), 372.

[5]Neil Sutherland, Children in English-Canadian Society: Framing the Twentieth-Century Consensus (Toronto, 1976), 11.

saw nothing of the inner, emotional life of children; 3) children played an important role in rural and family economies; and 4) child-rearing theory was intimately related to these perceptions and practices.[6] Based on observations elicited from correspondence regarding British children sent to homes in Canada, Sutherland says these children were treated the same as the foster parents' own children and therefore observations about them are indicative of all children.

Children were particulary susceptible to disease for several reasons: the lack of immunity from exposure, impure milk, poor diet, crowded schools, and home conditions. Aggravating this situation was the fact that people often did not seek professional medical care for themselves or their children when stricken with scarlet fever. Visiting a doctor for scarlet fever in the nineteenth century probably would have helped only in relieving some of the symptoms, since there was no known cure for the disease at that time. The attitudes toward medical care in Britain are illustrated in the following passage by A. Wohl, but can be applied to the situation in Essex County.

> Reluctance to incur medical costs, fear and awe of the doctors' often overbearing and condescending manner, distrust of doctors, reliance on traditional folk medicines and home remedies and a certain fatalism, all combined to make the poor unwilling to call in the doctor to attend infant maladies.[7]

---

[6]Sutherland, Children in English-Canadian Society, 6-7.

[7]A. Wohl, Endangered Lives: Public Health in Victorian Britain (Cambridge, 1983), 18.

This attitude was not confined only to the poor, or children. When children did die it was accepted that childhood mortality was a fact of life, and deaths were so frequent that parents prepared themselves for the possible death of a child.[8] This does not mean that parents were not deeply grieved at the loss of a child.[9]

In Essex County in 1871, school-aged children (those between five and fourteen years old) made up the second largest group of people who died from scarlet fever (see Appendix A). Schools were a particulary dangerous place for children to contract diseases. The number of schools and attendance at them was increasing in the nineteenth century.[10] Although an accurate enumeration of schools in existence in Essex County in 1871 is unavailable, Schedule Three of the Census indicates that there were at least eighty school houses. There were few productive opportunities for children in the mid-nineteenth century, and school offered custodial services as well as potential educational enrichment.[11] The point which must be noted here is that schooling was fairly common for smaller children, and was therefore an ideal location for the dissemination of communicable diseases. (Diseases contracted at schools would

---

[8]Linda S. Siegel, "Child Health and Development in English Canada, 1790-1850," in Charles G. Roland, ed., Health, Disease and Medicine: Essays in Canadian History. Proceedings of the First Hannah Conference on the History of Medicine, McMaster University, June 3-5, 1982., 367.

[9]Siegel, "Child Health," 373.

[10]Chad Gaffield's article, "Schooling, the Economy, and Rural Society in Nineteenth-Century Ontario," looks at Prescott County as a microcosmic model for the trends in the province at the time.

[11]Gaffield, "Schooling," 88.

also be brought home and transmitted to younger children and other non-immune members of the family.) The conditions in the schools were very crowded, and the ventilation was poor.[12] In the winter these problems were exacerbated by the inability of the children to escape outside for a recess, as well as by an increase in winter illnesses. Children who were not visibly ill were sent to school, unaware that they could be carriers of disease. It was common for the children, healthy or sick, to gather around the wood stove to keep warm. In addition, the wood construction of the school houses was not particulary conducive to sanitary cleansing. These conditions combined to make school a very dangerous place for children and teachers.

The response to illness in children in the nineteenth century was due to the wider perceptions toward death and illness. These attitudes were changing at the time, but they reflected important ideas which shed light on why people reacted the way they did to scarlet fever, and why they reacted differently to scarlet fever than to other diseases like cholera and smallpox. "Death is a cultural event and societies as well as individuals reveal themselves in their treatment of death."[13]

---

[12]see First Annual Report of the Provincial Board of Health of Ontario being for the year 1882, 168-176.

[13]James J. Farrell Inventing the American Way of Death, 1830-1920 (Philadelphia, 1980), 3.

In the middle ages there were few surprise or sudden deaths from disease,[14] since there were scant successful treatments, and illnesses were often long and painful. In the nineteenth century, with the progress of medicine, there were slightly more treatments for disease, some of which eased the pain and sometimes gave the afflicted person a chance to overcome certain death (more often from luck than any scientifically grounded application). Therefore in the nineteenth century when people died, it was sometimes inexplicable and horrifying because medicine could not prevent it. Deaths due to the sudden outbreak of disease often caused panic.[15]

These nineteenth century reactions to death were related to the prevailing religious ideas in that period. According to Schedule Three of the 1871 Census of Essex County, there were sixty-one religious institutions. This high number, coupled with the fact that most people indicated some religious denomination in the, Census suggests a high attendance rate at churches, where people undoubtedly learned or confirmed their ideas about death. (Incidentally, attendance at church services created another opportunity for exposure to disease.)

Uncertainty of when death would come and Christian theology convinced many that death was a sign of the absolute sovereignty of God and the powerlessness of humans. Shortness of life was

---

[14]Philipe Ariès, Western Attitudes toward DEATH, trans. by Patricia M. Ranum (Baltimore, 1974), 1-5.

[15]David B. Marshall, "Death Abolished: Changing Attitudes Toward Death in Victorian Canada," Paper presented to the annual meeting of the Canadian Historical Association, 1990, 7.

constantly referred to in funeral orations.[16] Protestants believed that the deathbed was God's last court and thought that the way the dying faced up to the final trial determined and was a sign of one's fate in eternity.[17] Catholics were so religious about death that it was rare that there was a foreseen death without the last rites having been administered by a priest.[18] Regardless of the denomination, death was a serious religious occasion. The significance of this period is that survivors accepted the death of another with greater difficulty than in the past.[19] Death not only brought hysteria, it also evoked reflection and meditation. The death of children was so commonplace and expected that there was sometimes no evidence of outward grief. That did not mean there was no grief--it was the sad resignation to a fact of late Victorian life in Canada. It would be remiss to say that a child was not missed in a family of twelve children as compared to a family of two children.[20] Before medicine and science had a notable impact on health and longevity, death was ever-present and unavoidable because of the perils of childbirth, childhood diseases, epidemics, workplace dangers and the like. Life

---

[16]Marshall, "Death Abolished," 10.

[17]Marshall, "Death Abolished," 11. For the Roman Catholic perspective of judgement, see Serge Gagnon, Mourir hier et aujourd'hui. De la mort chrétienne dans la campagne québécoise au XIXe siècle à la mort technisée dans la cité sans Dieu (Québec, 1987), 9.

[18]Gagnon, Mourir hier, 8.

[19]Ariès, Western Attitudes, 67-8.

[20]Gagnon, Mourir hier, 14-15.

expectancy was uncertain and therefore death was not easily ignored. The evangelical Christian outlook which stressed the darker aspects of death was deeply entrenched in Canadian society.[21]

Early in the nineteenth century there was an emphasis on the terrible side with fear and uncertainty surrounding the mystery of death. In the mid-nineteenth century the balance shifted toward a sense of assurance, and by late century the emphasis was on Christian hope of life everlasting; which made possible the celebration of death as a passage to perfect happiness and fulfillment in a heavenly paradise.[22] There was not a drastic change in attitudes toward death, but a gradual shift in sensibilities, "from stark realism to sentimental escapism"[23] The shift has been attributed to Christian theology, the intellectual quest to understand human destiny, romanticism, demographic trends, social change, and advances in medicine and public health.[24] The rise of science and medical knowledge greatly contributed to the changing perception of death. The idea that death was the result of natural causes as opposed to God's will became increasingly accepted, and as a result the place of medical men at the death bed increased and rivalled the place of priests.[25] Medical

---

[21]Marshall, "Death Abolished," 5.

[22]Marshall, "Death Abolished," 5.

[23]Marshall, "Death Abolished," 30.

[24]Marshall, "Death Abolished," 5.

[25]Marshall, "Death Abolished," 22.

intervention was no longer contrary to Christian perceptions of death--it was compatible with the view that death need not be full of pain and suffering.[26] Since death was central to life, changes in perceptions indicate changes in society as a whole.[27]

These changes were ubiquitous. J.I. Little conducted a study into the perceptions of death in the Lower St. John River Valley in the mid-nineteenth century. He examined the diary of a well-educated New Brunswick farmer, Alexander Machum, Jr., to elicit information about the attitudes toward death amongst the population he represented.[28] Most notable about the writing is the exclusive focus on mortality; there were 83 deaths noted, often in considerable detail, over a three year period. Marriages and births received only a cursory mention. This seemingly morbid preoccupation with death was not uncharacteristic of the nineteenth century.[29] Machum was neither cheerfully optimistic nor romantically melancholy about death. His detailed journal entries reflect a popular preoccupation with death.[30]

In a similar fashion Serge Gagnon studied private papers of parishioners in Quebec to elicit information about perceptions of

---

[26]Marshall, "Death Abolished," 23.

[27]Marshall, "Death Abolished," 30.

[28]see J.I. Little, "Death in the Lower St. John River Valley: The Diary of Alexander Machum, Jr., 1845-1849," Acadiensis, Autumn 1992, 22(1), 122-133.

[29]Little, "Death in Lower," 123-24.

[30]Little, "Death in Lower," 126-27.

death. He, too, found that death was a prominent theme.[31] He also found evidence of resignation about death in the diaries he studied.[32] Philipe Ariès said the attitude toward death evolved from passive resignation and mystical trust to romantic, rhetorical treatment.[33] James Farrell says Americans in 1800s tempered the preceding Puritan fear of death with a greater belief in human agency, but still had anxiety.[34] Farrell adds that in the mid-century the Americans also started to have a sentimentalized view of death.[35] David Marshall notes a similar trend in Upper Canada at mid-nineteenth century, but in Canada it was a religious transformation from fear and uncertainty to celebration of death as passage to heavenly paradise. The phenomenon of changing perceptions toward death has been the subject of many studies.[36] All of these studies indicate the wide range of localities which

---

[31]Gagnon, Mourir hier, 9.

[32]Gagnon, Mourir hier, 10.

[33]as cited in Little, "Death in Lower," 124.

[34]as cited in Little, "Death in Lower," 124.

[35]see Farrell, Inventing the American.

[36]Ann Douglas published a study of death which had a different perspective--that of consolation literature which became popular in this transition period. See Ann Douglas, "Heaven Our Homes: Consolation Literature in the Northern United States, 1830-1880," in David E. Stannard, ed., Death in America (Pennsylvania, 1975). Cemeteries also reflected changing attitudes. See Stanley French. "The Cemetery as Cultural Institution: The Establishment of Mount Auburn and the "Rural Cemetery" Movement," in David E. Stannard, ed., Death in America (Pennsylvania, 1975), 69-91., and Wilbur Zelinsky. "Unearthly Delights: Cemetery Names and the Map of the Changing American Afterworld," in David Lowenthal and Martyn J. Bowden, eds. Geographies of the Mind: Essays in Historical Geography (New York, 1976), 171-195.

exhibited these changing attitudes toward death, so it is probable that Essex County was no exception.

With the advance of medicine in the second half of the nineteenth century, illness replaced death as the focus.[37] Disease was intolerable and scandalous. "It is the fear of collapse, the sense of dissolution, which contaminates the Western image of all diseases..."[38] Disease was one aspect of the indeterminable universe from which people wished to distance themselves. To do so they constructed boundaries between themselves and those whom they believed to be more at risk.[39] People from lower classes were often diagnosed as being more gravely ill and were given poorer prognoses than those of other social classes.[40] Money could not only buy better health care, it could also pay for a clean bill of health, regardless of actual health or lack of it. It was the perception of the patient which determined his treatment.[41] People sought medical help only "if they can afford it, if it is available, and if it is expected of them."[42]

---

[37]Phillipe Ariès, "The Reversal of Death: Changes in Attitudes Toward Death in Western Societies," in David E. Stannard, ed., Death in America (Pennsylvania, 1975), 140.

[38]Sander L. Gilman, Disease and Representation: Images of Illness from Madness to AIDS (Ithaca and London, 1988), 1.

[39]Gilman, Disease and Representation, 4.

[40]Gilman, Disease and Representation, 4.

[41]Gilman, Disease and Representation, 6-7.

[42]Wendy Mitchinson, The Nature of Their Bodies: Women and Their Doctors in Victorian Canada, (Toronto, 1991), 4.

By way of an illustration of these perceptions, cholera, smallpox, and scarlet fever can be examined. People reacted differently to cholera and smallpox than they did to scarlet fever. There are several reasons for this anomaly. The most important difference is the perception of cholera and smallpox. Smallpox was one of the few diseases which doctors believed they could prevent,[43] and this had an impact on their attitude. Attitudes toward cholera were determined by entirely different factors. To the people of the nineteenth century, these two diseases were terrifying, inexplicable, extensive and indiscriminate.

Epidemic diphtheria, typhoid, and scarlet fever occurred more frequently than cholera but never equalled cholera's immediate traumatic impact.[44] Cholera was surpassed by many other diseases (including scarlet fever) in numbers of victims, but has attracted the attention of historians that other diseases (except the plague) have lacked. The reasons for this include the shock value, coincidence with social and political disturbances, the effect of sanitation efforts, and the availability and abundance of records.[45] The symptoms, unpredictable progress of the disease, and indiscriminate choice of victims were sources of terror. There

---

[43]See for example, Barbara Craig. "Smallpox in Ontario: Public and Professional Perception of Disease, 1884-1885," in Charles Roland, ed., Health, Disease and Medicine: Essays in Canadian History. Proceedings of the First Hannah Conference on the History of Medicine, McMaster University, June 3-5, 1982. 215-249.

[44]Craig, "Smallpox in Ontario,", 215.

[45]Margaret Pelling, Cholera, Fever and English Medicine, 1825-1865, (New York, 1978), 4.

was no medical cure, and sanitation was not yet fully understood. The impact of cholera was enormous, and it was on every person's mind.

> They feared its sudden, painful and arbitrary attack. They were horrified by the rapid course of the disease...They were baffled by the pattern of spread...They grew contemptuous of doctors who could do nothing for the victims and in some places they turned on the doctors and accused them of spreading the disease.[46]

Cholera was a disease which was affected by the sanitary efforts being tried, and was therefore seen as a disease of the poor and filthy.[47] It was thought to be a moral disease afflicted on sinners, but when some clergymen and respectable ladies contracted cholera, ideas changed,[48] and it heightened the anxiety over the affliction. It indiscriminantly struck the poor and the rich, and therefore it demanded attention. "Cholera was a hideous disease which created fear, panic, and a demand for action."[49] People in the nineteenth century perceived cholera in moralistic terms, but in reality it was indiscriminate in its impact.

---

[46]Geoffrey Bilson. A Darkened House: Cholera in the Nineteenth Century (Toronto, 1980), 4.

[47]R.J. Morris suggests that perhaps it seemed as though cholera was striking the lower classes because they constituted a large proportion of the population and therefore their deaths were noticed. See R.J. Morris, Cholera 1832: The Social Response to an Epidemic (New York, 1976), 84.

[48]Charles M. Godfrey. Medicine for Ontario: A History (Belleville, 1979), 150.

[49]Geoffrey Bilson, "Canadian Doctors and the Cholera," in S.E.D. Shortt, ed., Medicine in Canadian Society: Historical Perspectives (Montreal, 1981), 133.

Smallpox was another disease which caused abundant panic. Smallpox was called "one of the most loathsome, contagious, and lethal scourges menacing humanity."[50] One of the reasons for fear of this disease was the terrible disfiguring pock marks which were a distinguishing feature of the disease. William Osler effectively summed up the general opinion when he said: "The patient presents a terrible picture, unequalled in any other disease; one which fully justifies the horror and fright with which smallpox is associated in the public mind..."[51] To demonstrate this general feeling, Michael Bliss recounts the story of a railway worker who, when it was first discovered he had smallpox, had difficulty gaining admission to a hospital for care. None of the hospitals wanted a smallpox victim within its wards.

Like scarlet fever, smallpox was endemic in Ontario in the nineteenth century.[52] Except in epidemics, smallpox was usually mild enough to make it an accepted affliction of community life in Ontario.[53] By the mid-1880s doctors believed that they could control smallpox by vaccination, but a failure of public policy on the matter contributed to its rampage. Two of the most severe outbreaks were in Hungerford from November to December 1884, and in

---

[50]Michael Bliss, Plague: A Story of Smallpox in Montreal (Toronto, 1991), 39.

[51]as cited in Bliss, Plague, 41.

[52]Craig, "Smallpox in Ontario," 215.

[53]Craig, "Smallpox in Ontario," 216.

Montreal from June to December 1885.[54] There was alarm during the Hungerford epidemic which resulted in the state taking control; house by house vaccination and fumigation; arm by arm inspections of all travellers from Montreal; liberal use of police; mass fumigation of suspected goods; and destruction of private property by burning.[55] Like cholera, poverty, race and class were linked to smallpox as inescapable causes or rewards for patterns of living unacceptable to the majority.[56] Thought of as a "filth" disease, in reality it was a contagious disease which could spread anywhere. In the 1870-71 pandemic of smallpox there were 775 cases in 29 Ontario counties, and 371 deaths.[57]

In contrast to these two diseases, scarlet fever (which was equally volatile) was not given the same attention. Dr. Hazlewood of Grand Rapids, Michigan penned a paper entitled "The Prevention and Restriction of Diphtheria and Scarlet Fever". In it he stated that the death rate of smallpox, compared with that of scarlet fever, was small, but that people were afraid of and defended themselves against smallpox, while they took few precautions against scarlet fever,[58] which affected the same age groups. This

---

[54]Craig, "Smallpox in Ontario," 217.

[55]Craig, "Smallpox in Ontario," 221.

[56]Craig, "Smallpox in Ontario," 223.

[57]Wm. Perkins Bull, From Medicine Man to Medical Man: A Record of a Century and a Half of Progress in Health and Sanitation as Exemplified by Developments in Peel, (Toronto, 1934), 167.

[58]First Annual Report of the Provincial Board of Health of Ontario being for the year 1882, 49.

disparity of opinion presents a small conundrum which can be explained by looking at who was affected. One suggestion is that while high infant mortality from scarlet fever caused intense family grief, it was not a matter for public concern because of the attitude of inevitability and resignation.[59] Children were not yet wage-earners, and therefore, with a lack of foresight, their illness was not considered of critical importance to the well-being of the family. Even at the turn of the century infant mortality was not a major challenge for the Medical Health Officer.[60] This was the attitude despite the fact that children were future wage-earners, and that they were often the vehicles for infection within a household. This argument is not necessarily valid, since, as Neil Sutherland contends, children were integral to the family economy, and since the death of a care-giver (mother) in a family did have an immense impact on the well-being of a family, and these people were also often stricken with the disease.

A more compelling contention is that the horror associated with cholera and smallpox urged immediate attention. Cholera victims dehydrated and quite literally turned purple before finally dying. Smallpox victims were covered with thousands of disfiguring pustules, and if they survived, were marked for life. Scarlet fever was associated with a rash (although not always) which was a feature of many other diseases, and the rash quickly cleared up. Therefore, while scarlet fever may have in fact been a more

---

[59]Sutherland, Children in English-Canadian, 57.

[60]Sutherland, Children in English-Canadian, 57.

menacing disease, the perception of it did not evoke the same panic or response as cholera or smallpox.

The responses to different diseases and to disease in general were attributable to the different medical theories in the nineteenth century. There was no united front and little faith in nineteenth century medicine. People frequently preferred to treat their medical problems at home. Most believed in home remedies, and even when allopathy gained credibility there was still distrust. "The popularity of a variety of home cures, no matter what their success rate was, demonstrates the desperation of patients and their families."[61] Because of the limited effectiveness of and growing dissatisfaction with allopathic treatment during 1860s and 1870s many people relied upon "...various irregular practitioners and sectarians such as the homeopaths, eclectics, and Thompsonians whose approach to disease was as appealing to the patient as those of the regulars and in many cases less damaging."[62]

People were concerned because the efforts of allopathic physicians were often useless and sometimes dangerous; therefore some people chose other types of medicine which were rivalling allopathic medicine at the time: mesmerism, phrenology,

---

[61]Michael Smith, "Condemnation and Cooptation: The Erosion and Decline of the Health Reform Movement in Victorian Eastern North America," (Ottawa, 1993), 4.

[62]Colin D. Howell, "Elite Doctors and the Development of Scientific Medicine: The Halifax Medical Establishment and 19th Century Medical Professionalism," in Charles G. Roland, ed., Health, Disease and Medicine: Essays in Canadian History, (Hamilton, 1982), 106.

hydropathy, homeopathy, eclecticism, Thompsonism, diet and exercise formulae--all concerned with restoration and maintenance of a mental and physical balance through natural means. These were some of the alternative medicine options available to them. The alternative methods varied greatly with one another, but they are considered together here because they were all seen as different from allopathy based on the new scientific methods. The distinction, of course, is much more complex, and there was a varying degree of acceptance for the alternative methods. These forms of medicine are seen by today's standards to have been a fad and not taken seriously as viable forms of medical care.[63] While people rarely sought a doctor's care for scarlet fever, there were several doctors practicing medicine in Essex County in 1871. There were at least twenty-one doctors throughout the County, including allopaths, homeopaths, and other types of practitioners.[64]

There was a strong current of opposition to middle-class and medical professionalism.[65] In the eighteenth and early nineteenth centuries working class concepts of disease and health were different from those of professionals, and this was one reason for the lack of support for professional practitioners. Another cause for reluctance to seek medical care was the reliance on science,

---

[63] Smith, "Condemnation," 2.

[64] Dr. J.W. Brien. The Medical Men of Essex County (Windsor, 1950).

[65] Virginia Berridge, "Health and Medicine," in F.M.L. Thompson, ed., The Cambridge Social History of Britain, 1750-1950, vol. 3, Social Agencies and Institutions, (Cambridge, 1990), 187.

which was only beginning to take hold. It was not until the late 1870s that professionals began to become more accepted by the working class, when they became more accessible; there was a fall in the price of medicine; plus a rise in wages.[66] Acceptance was also advanced as science gained credibility and legitimacy.

The allopathic doctors were the ones who subscribed to newly discovered scientific methods. By 1871 the distinction between the different forms of medicine was vague. While in theory allopathy and the various forms of alternative medicine were sharply divided, in practice their methods were often similar. Relative to the period, what we would now refer to as quackery, was quite legitimate medicine. Compared with the medical knowledge of today, allopathic medicine was not always that different from the alternative medicine methods. Dr. Thomas Watson, a fellow of the Royal College of Physicians, which was considered to be a scientific school, described several remedies for scarlet fever which were believed to be rooted in science, but which were very similar to the methods practiced by homeopaths. Dr. Watson prescribed shaving the scalp to apply cold compresses, leeches to remove poison, blood letting, laxatives, wine, chlorine, and mercury, amongst other methods.[67] The similarity between Dr. Watson's methods and the methods prescribed by homeopaths indicates the range of medical knowledge which existed in 1871.

---

[66]Berridge, "Health and Medicine, 190-1.

[67]These, and other remedies, are described in more detail in Thomas Watson, Lectures on the Principles and Practice of Physic, (Philadelphia, 1851), 1001-1003.

The Halifax Medical Society's recommended treatment for scarlet fever was: at the onset of the disease leeches were to be freely applied to the lateral part of the external fauces or behind the ears. The patient was to inhale vapours of warm water, rinse the throat with mild detergent gargles, and ingest brisk purgatives. Then there was local bleeding at the later stages of the disease and finally "the physician was urged to administer a solution containing twelve grains of capsicum and an ounce of vinegar, or equivalents containing chloride of soda or the carbonate of ammonia."[68] These unpleasant allopathic treatments were in part responsible for bringing the scientific character of the profession into question. These practices should not be dismissed as eccentric, rural Canadian witchcraft.

> When the records of Canadian physicians are examined and the Canadian medical journals read, it is clear that Canadian practitioners were not isolated in a backwater or creating their own kind of medicine. They were able to keep up with the latest advances and their records abound with references to the international literature.[69]

The fact of the matter was that, regardless of the form of medicine which was followed, none of the practitioners had a cure for scarlet fever. This, together with the perceptions of death and illness, was the reason the disease ran uncontrolled. It was not until 1924 when the husband and wife team of Gladys and George Dick identified the scarlet fever toxin that there was an effective

---

[68]Howell, "Elite Doctors," 110.

[69]Mitchinson, Nature of Their Bodies, 11.

cure.[70] The Dicks were able to produce an antitoxin which was briefly used in serum therapy, but later replaced by more effective and less dangerous sulfonamides and penicillin.

Alternative medicine was successful to an extent for two reasons. Heroic (allopathic) medicine was not ostensibly effective, and the drastic measures often had horrible side-effects (like poisoning). Alternative medicine also enjoyed some success because the methods employed (fresh air, clean water, and rest) often did alleviate symptoms and sometimes hastened recovery, but not for the reasons believed by the doctors. These methods were and are part of healthful living. Regardless, they gave people the impression that alternative medicine was effective.[71] It is also true that sometimes a patient would be safer to ignore allopathic doctors because they prescribed some treatments which were dangerous, like the use of mercury. The different forms of alternative medicine eventually disappeared or were co-opted by modern society.[72]

These medical theories must be viewed in the context of predominant scientific theories of sanitation, the germ theory, and public health prevalent throughout Ontario, all of which led to a progression of the understanding of medicine. When one talks about

---

[70]Wesley W. Spink, Infectious Diseases: Prevention and Treatment in the Nineteenth and Twentieth Centuries, (Minneapolis, 1978), 181.

[71]M. Smith, "Condemnation," 7.

[72]for a more in-depth discussion of the cooptation of alternative medicine, see M. Smith, "Condemnation,".

public health in the 1870s, it is usually in reference to sanitation. The sanitary reformers were predominantly moral crusaders who were trying to improve the lot of those less fortunate than they. Their ideas came from the many theories of miasma, which simply stated was the erroneous belief that rotting human and animal waste produced noxious vapours which caused disease. Parallelling the rise of science in this period, the work of several noted medical men and scientists transformed the theories of miasma into bacteriology. Bacteriology and science gave way to the emerging field of public health. It was within this context that attitudes toward scarlet fever were formed. These attitudes shaped the response to the scarlet fever epidemic in Essex County in 1871.

Once bacteriology was established, public health began to emerge as a new movement, different from its predecessor, the sanitary idea. There were rudimentary facilities for the care of the ill and for assuring proper burial of the dead; but otherwise public health was considered to be a local concern about matters such as control of filth and smells, and the provision of basic medical relief for the poor. In 1867 health care (with the exception of quarantine) was designated as provincial jurisdiction for two reasons: it was not considered a matter of national importance and therefore not considered to be a subject to be dealt with by the national legislature responsible for Peace, Order and Good Government; and personal health was considered a private matter and care of the sick was a family or community

responsibility.[73] Before Departments of Health were established, there was no effort toward prevention and control, except through ad hoc committees. There are several examples of temporary facilities which were established to care for cholera victims in Essex County. However, the first permanent hospital in Essex was Hotel Dieu Hospital which was constructed in Windsor in 1890. There was no ad hoc Board of Health established to control the 1871 scarlet fever epidemic in Essex County.

In the mid-nineteenth century public health was usually only employed in times of an epidemic; other times it was not seen as necessary. The government entered the health field, before the 1867 Act defined powers, only on an ad hoc basis to control epidemics. Under the British North America Act, 1867, the powers of the Parliament were "to make laws for the peace, order, and good government of Canada, in relation to all matters not coming within the classes of subjects by this Act assigned exclusively to the Legislatures of the Provinces;"[74] and specifically relating to matters of health, for "Quarantine and the establishment and maintenance of Marine Hospitals,"[75] and for "the establishment, maintenance, and management of Penitentiaries."[76] The class of

---

[73]Peter Aucoin, "Federal Health Care Policy," in Carl A. Meilicke and Janet L. Storch, eds., Perspectives on Canadian Health and Social Services Policy: History and Emerging Trends (Ann Arbour, Michigan, 1980), 244.

[74]British North America Act, 1867, Section 91 (Ottawa, 1867).

[75]British North America Act, 1867, Section 91.

[76]British North America Act, 1867, Section 91.

subjects enumerated as being an exclusive power of provincial legislatures and which relates to matters of health was "the establishment, maintenance, and management of hospitals, asylums, charities, and eleemosynary institutions in and for the Province, other than marine hospitals."[77] There was no concept of public health at the time, but as public health came to the fore, the Act's shortcomings were realized and therefore the Dominion claimed the responsibility for public health problems of a national character or which were best administered by the Dominion, like major epidemics which were thought to be controlled best by quarantine. The provinces took responsibility for infectious diseases. Quarantine was ineffective in preventing the inland spread of diseases like scarlet fever.

It was within this context of conditions, perceptions, and theories that the government reacted. Evidence of the perceived importance of different diseases can be elicited from varying government responses to them. One can trace the government responses to epidemics in the 1870s by looking at federal and provincial documents from this period. The Sessional Papers of the Government of Canada reveal information regarding the administration of the federal government. Immigration, quarantine, and marine hospitals were within the realm of their responsibilities, and the action taken in these areas indicates the relative urgency the federal government conferred upon some diseases, by the notes made in the reports of the departments. In

[77] British North America Act, 1867, Section 92.

1871 the total expenditure by the Department of Agriculture for quarantine was $21 525.06. This included $13 828.47 at Grosse Isle Quarantine Station, $2 844.66 at Halifax Quarantine Station, $2 251.95 at St. John, N.B. Quarantine Station, and $2 599.99 for Inspecting Physicians in Quebec.[78]

The report included summaries of the activities of the quarantine stations. At Grosse Isle in 1871 there were 41 vessels (8 378 passengers) inspected; 17 of them required quarantine (3 398 passengers). One vessel carrying 427 passengers was detained under quarantine of observation for a short period. The number of hospital admissions resulting from the inspections was 267--10 from fever, 34 from smallpox, 27 from scarlet fever, 35 from measles, 17 from dysentery and diarrhoea, and 144 other non-contagious diseases. The seven hospital deaths from these patients consisted of three from scarlet fever, two from dysentery, and two from non-contagious diseases. There was specific mention made of smallpox:

> It is worthy of remark that although the small-pox was epidemic in the shipping ports of Great Britain, and the continent of Europe, only one steamship and nine sailing vessels coming to the St. Lawrence reported the occurrence of this disease during the voyage; while the number of admissions of small-pox cases to the hospital was only thirty four, with no deaths.[79]

---

[78]Canada, Department of Agriculture, "Report of the Minister of Agriculture of the Dominion of Canada for the calendar year 1871," Sessional Papers of the Government of Canada. Ottawa: Queen's Printer, 1872. 14.

[79]Canada, Department of Agriculture, "Report of the Minister of Agriculture of the Dominion of Canada for the calendar year 1871," Sessional Papers of the Government of Canada (Ottawa, 1872), 14.

There were almost as many cases of scarlet fever entering the country, and even three deaths from this disease, and yet no special note was made concerning scarlet fever, nor was there any special attention or expenditures made to attempt to control scarlet fever.

In 1871 The federal government was responsible for marine hospitals, quarantine, ad hoc committees for epidemics, and for health problems of a national character or those best administered by the Dominion. The provincial governments were responsible for everything else regarding health which was not specifically assigned to the Dominion. Despite the diseases which raged in this period, the Annual Report of the Commissioner of Agriculture and Public Works for the Province of Ontario, on Immigration, for the Year 1871, contained only two references to disease. The first was a letter regarding smallpox amongst immigrants in Toronto dated May 20, 1871 from the Honourable Christopher Dunkin, Minister of Agriculture, Ottawa. His letter was both a warning and an appeal to instruct the medical staff at Grosse Isle to use vigilance in the inspection of vessels and passengers this season. The second reference is a letter, written in response to this correspondence, from the Honourable John Carling, Commissioner of the Department of Public Works, Toronto. He thanked Dunkin for his warning and indicated that instructions as to the care needed were delivered. He added that steps had been taken to bring Ocean Mail Steamers (ordinarily exempt from quarantine) under a modified system of quarantine. He stated that he did not want to experience another

epidemic like the one of cholera in 1866. These were the only references to disease which were found in the Sessional Papers of the Ontario Government for the years 1871-2. Again, this indicates a general lack of response to scarlet fever. It is possible that since it was believed that nothing could be done about scarlet fever, nothing was done. This attitude was not restricted to the federal government--no efforts were made locally to stop the 1871 epidemic in Essex County.

The lack of response on the part of the government was a result of the prevailing conditions in the nineteenth century. These conditions included the contemporary theories regarding the nature of diseases. The Public Health Movement which came at the end of the century was the culmination of work by many men in many different fields of expertise. The precursor to public health was sanitary reform, which was the prevailing theory in 1871. To study an epidemic in 1871 one must consider only what was known in that time, and that was sanitation. These theories set the stage for the many different forms of medical practice which were available. A comprehension of all these theories is helpful in understanding why people reacted differently to different diseases. There is no question that cholera and smallpox were considered to be of critical importance, whereas scarlet fever which was equally critical, received little response, possibly due to the varying perceptions of these diseases. This attitude is part of a larger perspective of death and illness. To understand this mind-set it is imperative to comprehend the changes taking place in the mid- to

late nineteenth century with respect to disease and death. In addition to looking at who was primarily affected by scarlet fever, knowledge of the conditions of society which patterned the circumstances is crucial. This was the context within which the epidemic of scarlet fever in Essex County occurred.

Chapter Six

Conclusion

There are numerous factors which could produce an epidemic of scarlet fever. The factors presented in this paper are all related to the outbreak and diffusion of disease. In 1871 Essex County was similar to many other counties in Ontario in several respects. Upon comparison with some of these other counties, it becomes apparent that there were circumstances at that time which created the right conditions for an epidemic in Essex County but not in any of the control groups. The thesis of this paper is that the occurrence and severity of the epidemic of scarlet fever in 1871 resulted from the close relationship between the residents of Essex County and the City of Detroit.

In order to explain the occurrence of an epidemic in Essex County, and to substantiate the claim that the link with Detroit was the critical factor, several points must be clarified. These points are elucidated in Chapters Two to Five, and represent the conditions which caused the epidemic. First, it must be determined that scarlet fever was a serious disease, but that relative to other diseases it received little attention. Next the impact of demographic changes taking place relative to scarlet fever should be examined. The social context, including social conditions, perceptions of death and illness, and prevailing medical and scientific theories followed, is integral to understanding the circumstances within which the epidemic occurred. On a more technical side, it is demonstrated that scarlet fever had a

cyclical nature, and that there was in fact an epidemic in Essex County in 1871. Following this is a summary of the potential epidemic-causing features which were shared by Essex County and the four control groups. As these conclusions narrow toward proving the thesis, the final important points to remember are that there was a link with a large metropolis which was unique to Essex County, and that there were also deaths from scarlet fever in Detroit.

Scarlet fever was a very serious and sporadic disease. Since the time it was first recognized it is known that there were epidemics flaring up throughout North America and Europe. In the nineteenth century scarlet fever was the most deadly of all infantile diseases in England. In Ontario in the 1870s it was amongst the ten most lethal diseases. In this era the death rate from scarlet fever was greater than that from cholera or smallpox, however it received less attention than these other two hideous diseases. This was due mainly to the varying perceptions of these diseases.

In the mid-Victorian period the death rate was gradually falling. One contributing factor to this decrease was fewer deaths from infectious diseases. Scarlet fever was among the diseases which caused a high death rate before this period, and which has been credited with contributing to a reduction of the death rate in general. This did not eliminate the sporadic occurrence of epidemics when the correct conditions arose.

The living conditions in 1871 were conducive to the spread of infectious diseases. Initially contagion was misunderstood and therefore efforts to contain an illness were ineffective. As science progressed, allopathic medicine gained credibility, but peoples' distrust of professional medical treatments was firmly entrenched, despite the large number of doctors practicing various types of medicine in Essex County at the time. The new and more scientific allopathy initially had few followers among the common people. These people were resigned to life with the ever-present threat of sudden death. As the traditional methods of homeopathy were gradually replaced by allopathy, attitudes toward death and disease changed, bringing more hope to peoples' lives.

Scarlet fever was a disease which followed a cyclical pattern of severity. It was mild until the 1840s when the mortality rate from scarlet fever doubled. Beginning in 1861 the mortality rate began a descent and by 1881 it had significantly decreased. Despite the gradual lowering of deaths from scarlet fever, it was still a significantly virulent disease in 1871, as we can see from the high number of deaths in Essex County that year.

The virus was virulent enough that there was an epidemic of scarlet fever in Essex County in 1871. Of 566 deaths that year, 124 were from scarlet fever. This was almost 22 percent of all deaths in Essex County, and accounted for 15 percent of all scarlet fever deaths in Ontario. This figure did not include the number of deaths listed as being from fever or erysipelas, which may have been misdiagnosed and may actually have been scarlet fever.

By its nature, scarlet fever affected the young in the highest proportions. The largest age group affected was 0-4 years. Seventy-seven children under the age of five died from this disease. This was likely because this was the group with the least immunity to the virus. The counties of Waterloo North, Bruce South, Simcoe North, and Welland all had a similar age structure, but no epidemic of scarlet fever.

Other common features between the counties of Waterloo North, Bruce South, Simcoe North, Welland, and Essex were relative wealth, population densities, climate, and physical locations. Essex County shared similar characteristics in these areas with at least one other county in each case. Since of the five only Essex County had an outbreak, none of these factors can be the cause of the epidemic.

Scarlet fever is a respiratory illness and is easily transmittable. Therefore transportation links are another potential cause for an epidemic because they increase the likelihood of cross-infection between people. None of the five counties was completely isolated by 1871. Railways, roads, and water routes were all well-established and there was frequent traffic between each of these areas and outside cities and towns. Transportation is quite often responsible for the diffusion of a disease, however the links between Essex County and other regions in Ontario did not appear to have been a factor in the spread of scarlet fever in 1871. Nor did the links between the control groups and other regions produce an epidemic of scarlet fever.

The one feature unique to Essex County was the proximity of a large metropolis and daily transportation between the two. The City of Detroit had a population of 79 577. There were numerous means for crossing the border, and there were significant numbers of people who crossed daily for commerce and recreation. None of the other counties studied had such direct, daily contact with a city of that size.

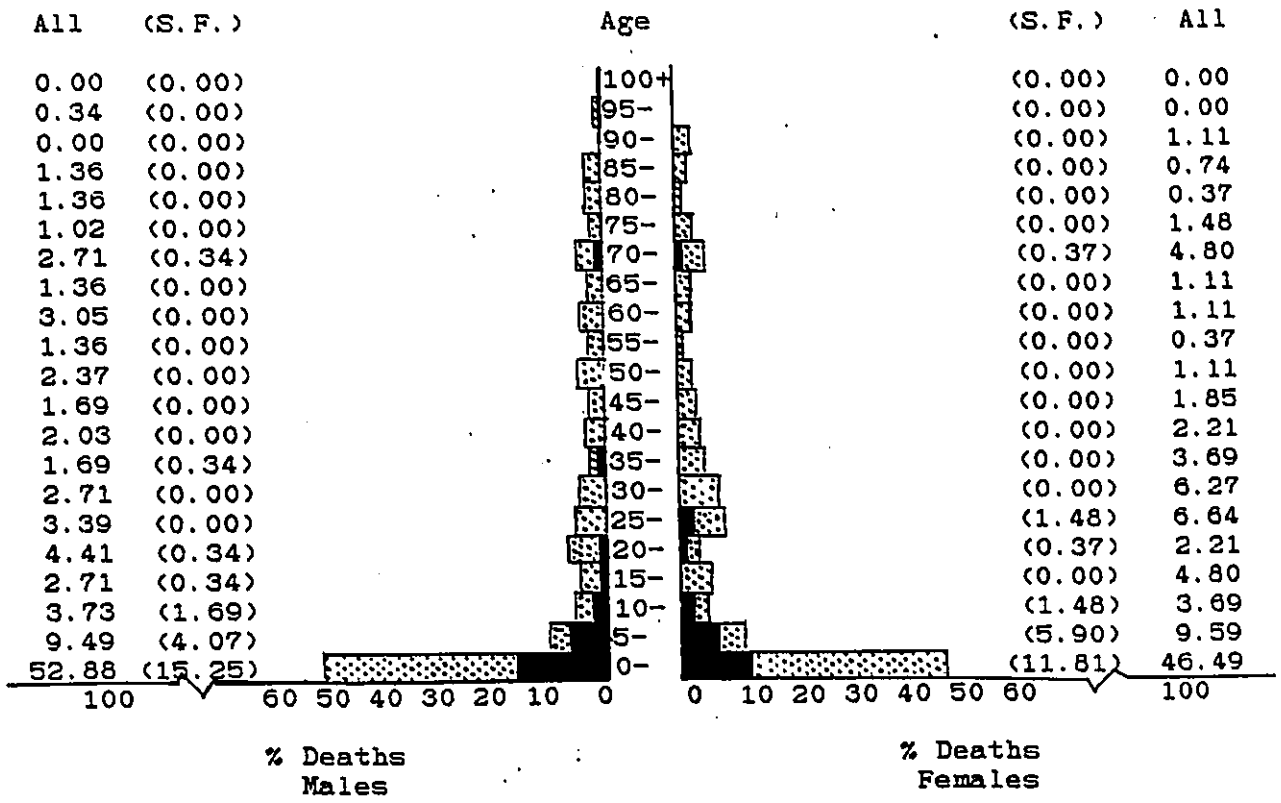
In Detroit in 1870 there were 73 deaths from scarlet fever out of 987 total deaths. Forty-nine of these victims resided in Wards Seven and Ten, which were both adjacent to the Detroit River and to which there was likely a large volume of cross-border traffic. Since scarlet fever was endemic in the area, and because there were numerous cases throughout 1870 in Detroit, there was probably a sufficient infectious reservoir of individuals to interact with the cross-border commuters, to effect cross-infection and thereby spark and prolong an epidemic in Essex County. In addition to this, several of the scarlet fever deaths in Detroit occurred in the months of June and July of 1870 and therefore corresponded with deaths from scarlet fever in Essex County in the same months.

The County of Essex in 1871 was an area which was similar to many other counties in Ontario. The sporadic nature of scarlet fever, and the fact that the conditions in Essex County were similar to many other regions, meant that there was the potential for an epidemic anywhere, and yet Essex was the only county of the five studied which was stricken. Of all the factors which could be attributed to an epidemic, there was only one which was unique to

Essex County at that time. Therefore of all the possible factors relating to the occurrence and severity of the epidemic which were examined, the only one which appears to have been likely was the constant and regular contact between the residents of Essex County and the City of Detroit.

APPENDIX A

% DEATHS FROM SCARLET FEVER,
SUPERIMPOSED ON % TOTAL DEATHS,
BY AGE, ESSEX COUNTY, ONTARIO, 1871



566 Total Deaths--295 Male
271 Female

124 Scarlet Fever Deaths--66 Male
58 Female

* Note: The total living population for 1871 was not provided in five year cohorts, and is therefore not available for comparison.

APPENDIX B

1871 MANUSCRIPT CENSUS--microfilm #9888, 9889, 9890
Province of Ontario, District no. 1 Essex,
Nominal Return of Deaths, June 1, 1870-May 31, 1871

* Scarlet fever deaths are highlighted by bold, upper-case print.

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
			Sub-District A--Malden, township				
m	0	Cath	Ont	---	-	Jul'70	kidney dis.
m	0	Meth	Ont	---	-	Aug'70	fits
m	0	CofE	Ont	---	-	Apr'71	H2O on brain
f	7	Cath	Ont	---	-	Dec'70	typhoid fever
M	**4**	**CATH**	**ONT**	---	-	**SEP'70**	**SCARLET FEVER**
f	93	Pres	Scot	---	w	Sep'70	old age
f	0	Cath	Ont	---	-	Mar'71	fits
m	30	Meth	Ont	farmer	m	Apr'71	accident
f	3	---	Ont	---	-	Dec'70	consumption
M	**7**	**METH**	**ONT**	---	-	**FEB'71**	**SCARLET FEVER**
F	**5**	**METH**	**ONT**	---	-	**FEB'71**	**SCARLET FEVER**
f	0	Meth	Ont	---	-	Feb'71	brain fever
f	0	---	Ont	---	-	Aug'70	unknown
f	0	---	Ont	---	-	May'71	unknown
m	77	Meth	Ont	farmer	m	Nov'70	dropsy
M	**3**	**---**	**ONT**	**---**	-	**SEP'70**	**SCARLET FEVER**
m	26	CofE	Ont	farmer	-	Jun'70	brain fever
f	31	Cath	Ont	---	m	Mar'71	child birth
m	47	Meth	U.S.	farmer	m	Mar'71	consumption
m	1	Cath	Ont	---	-	Oct'70	scalded
m	10	Meth	Ont	---	-	Jul'70	bronchitis
F	**2**	**METH**	**ONT**	**---**	-	**JAN'71**	**SCARLET FEVER**
f	0	Cath	Ont	---	-	Jul'70	diarrhoea
			Sub-District B--Amhurstburg, town				
m	0	Prot	Ont	---	-	Jul'70	convulsions
f	0	Cath	Ont	---	-	Jul'70	convulsions
f	0	CofE	Ont	---	-	Jan'71	severe cold
f	5	Meth	Ont	---	-	Jul'70	consumption
m	51	Meth	U.S.	farmer	m	May'71	consumption
m	1	Cath	Ont	---	-	Nov'70	dis. bowel
M	**1**	**CATH**	**ONT**	**---**	-	**FEB'71**	**SCARLET FEVER**
m	65	Meth	Afr	labourer	m	Feb'71	consumption
m	0	Cath	Ont	---	-	Apr'71	inflammation
f	37	Cath	Que	---	m	Feb'71	dis. bowel
m	17	Cath	Ont	labourer	-	Dec'70	fits
m	63	Cath	Que	labourer	m	Oct'70	drowned
f	2	Cath	Ont	---	-	Jul'70	wh. cough
m	37	Cath	Ont	labourer	m	Dec'70	pleurosy

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	2	Bapt	Ont	---	-	Apr'71	accident
f	0	Bapt	Ont	---	-	Oct'70	inflammation
m	1	Cath	Ont	---	-	Nov'70	wh. cough
M	5	METH	ONT	---	-	SEP'70	SCARLET FEVER
m	20	Cath	red?	mariner	-	Mar'71	infla. brain
m	72	Meth	U.S.	shoemaker	m	Jan'71	consumption
m	2	Bapt	Ont	---	-	Apr'71	inflammation
m	4	Bapt	Ont	---	-	Oct'70	consumption
m	1	Bapt	Ont	---	-	Mar'71	brain fever
f	0	Cath	Ont	---	-	Feb'71	brain fever
m	87	Cath	Que	labourer	w	Jan'71	old age
m	83	Cath	Ont	gentleman	m	Feb'71	paralysis
f	0	Cath	Ont	---	-	Sep'70	consumption
f	31	Cath	Ont	---	m	Dec'70	consumption
f	4	Pres	Ont	---	-	Mar'71	brain fever
m	0	---	Ont	---	-	Mar'71	---
m	29	Cath	Ont	law student	-	Apr'71	infla. lungs
f	35	Epis	U.S.	---	m	Jan'71	consumption
m	50	CofE	Ire	druggist	m	Nov'70	consumption
m	0	Cath	Ont	---	-	Mar'71	convulsions
f	70	Cath	Ire	---	m	May'71	---
f	28	Cong	Ont	---	m	Apr'71	consumption
f	0	Cath	Ont	---	-	Dec'70	accident
f	0	Cath	Ont	---	-	Dec'70	birth
m	8	Pres	Eng	---	-	Sep'70	drowned
f	18	CofE	Eng	---	m	Feb'71	liver compla.

Sub-District C--Anderdon, township

m	80	Bapt	U.S.	---	m	Aug'70	scrofuls
m	73	Meth	U.S.	---	m	Aug'70	infla. lungs
f	3	Cath	Ont	---	-	Jul'70	erysipelas
m	60	Cath	Ire	---	m	Oct'70	dis. of heart
F	7	CATH	ONT	---	-	NOV'70	SCARLET FEVER
m	25	CofE	Ont	seaman	-	Dec'70	consumption
f	34	Cath	Ont	---	w	Dec'70	consumtion
m	44	CofE	Ire	farmer	m	Sep'70	consumtion
F	8	CATH	ONT	---	-	OCT'70	SCARLET FEVER
F	6	CATH	ONT	---	-	OCT'70	SCARLET FEVER
F	5	CATH	ONT	---	-	OCT'70	SCARLET FEVER
f	27	Cath	Ont	---	m	Aug'70	child birth
f	26	---	U.S.	---	-	Dec'70	heart dis.
f	18	---	Ont	---	-	Mar'71	consumption
m	42	Cath	Ont	blacksmith	m	Apr'71	consumption
f	27	Cath	Ont	---	-	Mar'71	consumption
m	0	CofE	Ont	---	-	Mar'71	wh. cough
m	34	Cath	Ont	---	-	Jan'71	erysipelas
F	4	CATH	ONT	---	-	OCT'70	SCARLET FEVER
M	1	CATH	ONT	---	-	SEP'70	SCARLET FEVER
f	17	Meth	Ont	---	-	Mar'71	typhoid fever

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
F	5	METH	ONT	---	-	JAN'71	SCARLET FEVER
M	3	METH	ONT	---	-	JAN'71	SCARLET FEVER
f	18	Meth	Ont	---	m	May'71	cancer
m	0	Cath	Ont	---	-	Nov'70	croup
F	2	CATH	ONT	---	-	OCT'70	SCARLET FEVER
M	1	CATH	ONT	---	-	JAN'71	SCARLET FEVER
m	0	Cath	Ont	---	-	Jan'71	croup
m	3	Cath	Ont	---	-	Jun'70	---
M	2	CATH	ONT	---	-	SEP'70	SCARLET FEVER
F	4	CATH	ONT	---	-	AUG'70	SCARLET FEVER
m	29	Cath	Ont	farmer	m	Aug'70	sunstroke
m	56	Cath	Ire	---	m	Aug'70	consumption
F	10	CATH	ONT	---	-	JUL'70	SCARLET FEVER
F	3	CATH	ONT	---	-	MAR'71	SCARLET FEVER
F	5	CATH	ONT	---	-	SEP'70	SCARLET FEVER
M	0	CATH	ONT	---	-	JAN'71	SCARLET FEVER
F	73	METH	U.S.	---	W	OCT'70	SCARLET FEVER
f	25	Meth	U.S.	---	-	Sep'70	consumption
f	28	Meth	U.S.	---	m	Jan'71	consumption
f	0	Cath	Ont	---	-	Aug'70	diarrhoea
f	4	Meth	Ont	---	-	Jun'70	heart dis.
m	1	CofE	Ont	---	-	Aug'70	? infla.
m	0	CofE	Ont	---	-	Apr'71	---
F	4	CATH	ONT	---	-	AUG'70	SCARLET FEVER
F	3	CATH	ONT	---	-	JAN'71	SCARLET FEVER
f	0	Cath	Ont	---	-	Jan'71	---

Sub-District D--Colchester, township

m	60	CofE	Eng	farmer	m	Apr'71	infla.
f	10	Bapt	Ont	---	-	Sep'70	diptheria
m	8	Meth	Ont	---	-	Nov'70	typhoid fever
F	13	METH	ONT	---	-	FEB'71	SCARLET FEVER
M	8	METH	ONT	---	-	FEB'71	SCARLET FEVER
f	72	Meth	U.S.	---	w	Sep'70	bronchitis
M	0	CATH	ONT	---	-	FEB'71	SCARLET FEVER
m	19	Bapt	U.S.	farmer	-	Oct'70	fever
f	16	Meth	U.S.	---	-	Jul'70	consumption
m	72	Meth	U.S.	farmer	m	Oct'70	old age
f	2	Bapt	Ont	---	-	Sep'70	---
f	21	CofE	Ont	---	-	Feb'71	heart dis.
M	7	CATH	ONT	---	-	JAN'71	SCARLET FEVER
F	5	CATH	ONT	---	-	JAN'71	SCARLET FEVER
m	1	CofE	Eng	---	-	Oct'70	---
m	34	Cath	Ger	farmer	m	Jul'70	bilious fever
F	2	CATH	ONT	---	-	FEB'71	SCARLET FEVER
F	9	COFE	ONT	---	-	FEB'71	SCARLET FEVER
F	2	CATH	ONT	---	-	JAN'71	SCARLET FEVER
m	0	Meth	U.S.	---	-	Apr'71	fits
F	6	CATH	ONT	---	-	FEB'71	SCARLET FEVER

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	1	Epis	Ont	---	-	Sep'70	wh. Cough
m	86	Meth	Scot	farmer	m	Jan'71	old age
M	0	COFE	ONT	---	-	JAN'71	SCARLET FEVER
f	0	Meth	Ont	---	-	Jan'71	wh. cough
m	2	CofE	Ont	---	-	Sep'70	unknown
M	4	COFE	ONT	---	-	FEB'71	SCARLET FEVER
f	0	CofE	Ont	---	-	Jun'70	infla. lungs
f	71	Bapt	Ont	---	w	Jul'70	palsey
m	46	Meth	Ont	labourer	m	Jul'70	consumption
f	0	Meth	Ont	---	-	Oct'70	unknown
f	63	Bapt	Ont	---	w	Jan'71	consumption
f	78	CofE	Ont	---	m	May'71	unknown
m	28	Meth	Eng	farmer	m	Aug'70	paralysis
F	20	BAPT	ONT	---	-	JAN'71	SCARLET FEVER
m	0	Bapt	Ont	---	-	Nov'70	unknown
f	38	CofE	Ont	---	-	Nov'70	unknown
M	1	METH	ONT	---	-	OCT'70	SCARLET FEVER
m	59	Meth	U.S	farmer	m	Jan'71	erysipelas
f	46	Meth	U.S	---	m	Jan'71	pleurosy
f	0	Prot	Ont	---	-	Jan'71	unknown
M	0	COFE	ONT	---	-	JAN'71	SCARLET FEVER
f	75	Meth	N.S.	---	w	Jan'71	old age
m	8	Meth	N.S.	---	-	Jan'71	unknown
m	88	Pres	Scot	builder	w	Apr'71	paralysis
f	2	Meth	N.S.	---	-	Mar'71	consumption

Sub-District E--Gosfield, township

f	70	Pres	Scot	---	w	Feb'71	cancer
f	30	Meth	Ont	---	m	Sep'70	consumption
M	3	---	ONT	---	-	JAN'71	SCARLET FEVER
f	42	Meth	Ont	---	m	Feb'71	consumption
M	2	METH	ONT	---	-	FEB'71	SCARLET FEVER
f	14	Meth	Ont	---	-	Jul'70	convulsions
m	0	Meth	Ont	---	-	Jun'70	---
m	53	Bapt	Ont	farmer	m	May'71	---
m	37	CofE	Eng	blacksmith	m	Nov'70	consumption
M	3	COFE	ONT	---	-	MAY'71	SCARLET FEVER
m	0	Meth	Ont	---	-	Feb'71	wh. cough
f	0	CofE	Ont	---	-	Nov'70	still born
M	1	METH	ONT	---	-	FEB'71	SCARLET FEVER
M	0	COFE	ONT	---	-	FEB'71	SCARLET FEVER
m	0	---	Ont	---	-	Mar'71	premat. birth
f	0	---	Ont	---	-	Mar'71	premat. birth
m	20	Meth	Ont	---	-	Jan'71	consumption
f	33	Meth	U.S.	---	m	Nov'70	childbed
m	3	Meth	Ont	---	-	Apr'71	unknown
f	70	Meth	U.S.	---	w	Jun'70	dropsy
m	0	Bapt	Ont	---	-	Sep'70	---
m	75	Bapt	U.S.	farmer	m	Jan'71	fits

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
m	2	Meth	Ont	---	-	Feb'71	scalding tea
m	85	Univ	U.S.	millwright	m	Mar'71	old age
m	17	Bapt	Ont	---	-	May'71	typhoid fever
f	40	Meth	Ont	---	m	Dec'70	consumption
f	0	CofE	Ont	---	-	Sep'70	inflammation
f	49	Meth	Ont	---	m	Mar'71	erysipelas
m	9	CofE	Ont	---	-	Jul'70	rheumatism
m	98	Meth	U.S.	farmer	w	Feb'71	old age
m	24	Meth	Ont	clerk	m	Apr'71	cut with axe
f	0	Meth	Ont	---	-	Sep'70	H2O on brain
F	1	METH	ONT	---	-	FEB'71	SCARLET FEVER
f	17	Meth	Ont	---	-	May'71	consumption
m	24	CofE	Ont	mariner	m	Jan'71	consumption
				Sub-District F--Mersea, township			
f	22	Meth	Ont	sch mistre	-	Dec'70	consumption
f	49	Meth	Ont	---	m	Jul'70	consumption
m	56	Meth	Ont	farmer	m	Mar'71	consumption
f	28	Meth	Ont	---	m	Jan'71	consumption
f	34	Meth	Ont	---	m	Mar'71	confinement
f	6	Bapt	Ont	---	-	Dec'70	spinal dis.
m	0	---	Ont	---	-	Sep'70	unknown
m	70	Meth	Eng	labourer	m	Sep'70	infla. bowel
f	0	---	Ont	---	-	Jul'70	dis. of bowel
m	1	---	Ont	---	-	Sep'70	dis. of bowel
m	0	---	Ont	---	-	Jan'71	brain fever
f	35	Meth	Ont	---	m	May'71	consumption
f	2	---	Ont	---	-	Sep'70	wh. cough
f	86	Meth	Ont	---	-	Jan'71	---
				Sub-District G--Pelée, township			
f	37	Pres	Eng	---	m	Jul'70	child birth
m	0	---	Ont	---	-	Sep'70	infla. lungs
m	0	---	Ont	---	-	Jul'70	infla. lungs
				Sub-District H--Sandwich West, township			
M	4	CATH	ONT	---	-	JAN'71	SCARLET FEVER
F	26	CATH	ONT	---	M	JAN'71	SCARLET FEVER
F	5	PROT	U.S.	---	-	JAN'71	SCARLET FEVER
M	3	CATH	ONT	---	-	FEB'71	SCARLET FEVER
M	0	CATH	ONT	---	-	APR'71	SCARLET FEVER
F	3	CATH	ONT	---	-	JAN'71	SCARLET FEVER
M	1	CATH	ONT	---	-	JAN'71	SCARLET FEVER
M	39	CATH	ONT	FARMER	M	OCT'70	SCARLET FEVER
f	62	Cath	Ont	---	m	Nov'70	unknown
m	9	Cath	Ont	---	-	Jan'71	not given
M	3	CATH	ONT	---	-	JAN'71	SCARLET FEVER

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	74	Cath	Ont	---	w	Apr'71	---
f	1	Cath	Ont	---	-	Aug'70	---
f	1	Cath	Ont	---	-	Mar'71	---
f	1	Cath	Ont	---	-	Nov'70	---
F	5	CATH	ONT	---	-	FEB'71	SCARLET FEVER
F	2	CATH	ONT	---	-	FEB'71	SCARLET FEVER
f	73	Cath	Ont	---	w	Aug'70	---
M	4	CATH	ONT	---	-	MAR'71	SCARLET FEVER
f	5	Cath	Ont	---	-	Dec'70	---
f	0	Cath	Ont	---	-	Jul'70	---
M	0	CATH	ONT	---	-	FEB'71	SCARLET FEVER
f	19	Cath	Ont	---	-	Mar'71	infla. lungs
m	1	Cath	Ont	---	-	Aug'70	---
F	1	CATH	ONT	---	-	DEC'70	SCARLET FEVER
F	25	CATH	ONT	---	M	DEC'70	SCARLET FEVER
M	6	CATH	ONT	---	-	DEC'70	SCARLET FEVER
F	5	CATH	ONT	---	-	DEC'70	SCARLET FEVER
m	0	Cath	Ont	---	-	Feb'71	---
m	20	Cath	Ont	---	-	Dec'70	---
f	1	Cath	Ont	---	-	Aug'70	diarrhoea
m	0	---	Ont	---	-	Aug'70	cholera
M	1	CATH	ONT	---	-	DEC'70	SCARLET FEVER
m	0	Cath	Ont	---	-	Jun'70	---
f	54	Cath	Ont	---	w	Mar'71	---
f	12	Meth	Ont	---	-	Jun'70	---
F	0	CATH	ONT	---	-	JAN'71	SCARLET FEVER
m	21	Cath	Que	labourer	-	Jun'70	consumption
m	66	CofE	Eng	farmer	w	Sep'70	---
f	0	Cath	Fra	---	-	Jul'70	---
m	2	Cath	Ont	---	-	Apr'71	croup
f	2	Cath	Ont	---	-	Jan'71	croup
m	1	CofE	Ont	---	-	Oct'70	---
m	1	Cath	Ont	---	-	Aug'70	---
f	1	Prot	Ont	---	-	Feb'71	---
f	30	Bapt	U.S.	---	-	Dec'70	asthma
f	25	Bapt	U.S.	---	-	Dec'70	consumption
f	1	Meth	Ont	---	-	Apr'71	---
F	12	PRES	ONT	---	-	SEP'70	SCARLET FEVER
f	86	Cath	Ont	---	w	Dec'70	---
f	0	Cath	Ont	---	-	Feb'71	---
f	1	Cath	Ont	---	-	Oct'70	---
m	0	Cath	U.S.	---	-	Jul'70	---
f	80	Cath	Ont	---	w	Mar'71	---
f	2	Cath	Ont	---	-	Sep'70	---
m	33	Cath	Que	labourer	w	Jan'71	---
m	0	Cath	Ont	---	-	Feb'71	cholera

Sub-District I--Sandwich, town

m	0	---	Ont	---	-	Jan'71	---

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
m	0	---	Ont	---	-	Jul'70	infla. lungs
m	0	---	Ont	---	-	Jun'70	---
f	90	Meth	U.S.	---	w	Oct'70	---
m	2	Cath	Ont	---	-	Jul'70	infla. bowel
m	83	Meth	U.S.	farmer	m	Nov'70	infla. bowel
f	2	Epis	Ont	---	-	Mar'71	pneumonia
m	42	---	Que	butcher	m	Dec'70	delerium
m	3	---	Ont	---	-	Jul'70	---
f	23	Cath	Que	---	-	Sep'70	consumption
m	54	Meth	Ont	merchant	m	May'71	appoplexy
f	24	Epis	Ont	---	m	Jul'70	conges. brain
f	17	Cath	U.S.	---	-	Nov'70	consumption
m	63	Cath	Que	cus.hse.of.	m	Feb'71	conges. brain
m	0	Cath	Ont	---	-	Apr'71	brain fever
f	14	Cath	Ont	---	-	Oct'70	---
m	6	Cath	Ont	---	-	Mar'71	---
f	73	Cath	Ont	---	w	Mar'71	paralysis
f	3	Cath	Ont	---	-	Sep'70	---
f	90	Cath	Ger	---	w	Oct'70	---
M	3	CATH	ONT	---	-	FEB'71	SCARLET FEVER
M	74	BAPT	QUE	FARMER	W	AUG'70	SCARLET FEVER
f	41	Epis	Eng	---	m	Jul'70	typhoid fever
m	0	---	Ont	---	-	Jul'70	---
f	44	Epis	Eng	---	m	Oct'70	dis. of heart
m	0	Bapt	Ont	---	-	Nov'70	---
m	44	Cath	Ont	attorney	-	Aug'70	consumption

Sub-District J--Sandwich East, township

m	2	Cath	Ont	---	-	Apr'71	teething
m	11	Cath	Ont	---	-	Mar'71	sore throat
m	0	Cath	Ont	---	-	Sep'70	sore head
f	36	Cath	Ont	---	m	Mar'71	consumption
m	2	CofE	Ont	---	-	Jul'70	diarrhoea
f	1	CofE	Ont	---	-	Aug'70	unknown
M	3	CATH	ONT	---	-	JAN'71	SCARLET FEVER
M	4	CATH	ONT	---	-	DEC'70	SCARLET FEVER
f	20	Cath	Ont	---	m	Apr'71	confinement
m	0	Cath	Ont	---	-	Jul'70	diarrhoea
m	72	Cath	Ire	farmer	m	Sep'70	infla. bowel
f	31	Cath	Ont	---	m	Apr'71	consumption
M	4	CATH	ONT	---	-	NOV'70	SCARLET FEVER
f	0	Bapt	Ont	---	-	Jun'70	consumption
m	63	Meth	Scot	farmer	m	Sep'70	neuralgia
f	40	Cath	Ire	---	m	Feb'71	cancer
m	5	Bapt	Ont	---	-	Sep'70	catarrah
m	28	Cath	Ire	farmer	-	Jun'70	sore throat
m	0	Cath	Ont	---	-	May'71	not known
m	0	Cath	Ont	---	-	Jul'70	wh. cough
m	21	Cath	Ont	farmer	-	Oct'70	typhoid fever

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	2	Cath	Ont	---	-	Apr'71	lung fever
f	54	Cath	Ont	---	m	Sep'70	---
M	2	CATH	ONT	---	-	SEP'70	SCARLET FEVER
f	-	Cath	Ont	---	-	Oct'70	---
f	33	Cath	Ont	---	-	Apr'71	consumption
m	0	Cath	Ont	---	-	Aug'70	still born
m	0	Cath	Ont	---	-	???'70	still born
F	1	CATH	ONT	---	-	AUG'70	SCARLET FEVER
M	1	CATH	ONT	---	-	DEC'70	SCARLET FEVER
f	71	Cath	Ont	---	-	Jul'70	dropsy
m	0	Cath	Ont	---	-	Dec'70	---
f	4	Cath	Ont	---	-	May'71	poison
f	0	Cath	Ont	---	-	Jul'70	---
m	78	Cath	Ont	---	-	Oct'70	?
m	2	Cath	Ont	---	-	Sep'70	---
F	0	PRES	ONT	---	-	SEP'70	SCARLET FEVER
f	0	Meth	Ont	---	-	Oct'70	bilious fever
f	47	Cath	Ont	---	m	Jun'70	child birth
m	1	Cath	Ont	---	-	Jul'70	croup
M	11	CATH	QUE	---	-	MAR'71	SCARLET FEVER
m	0	Cath	Ont	---	-	Jun'70	croup
f	43	Meth	U.S.	---	m	Oct'70	typhoid fever
m	?	Cath	Ont	---	-	Aug'70	---
f	0	Meth	Ont	---	-	Nov'70	---
f	0	Cath	Ont	---	-	Feb'71	unknown
m	1	Cath	Ont	---	-	Nov'70	---
m	0	Cath	Ont	---	-	Nov'70	---
m	47	Cath	Que	carpenter	w	Jun'70	lung fever
f	68	Cath	Ire	farmer	m	Mar'71	asthma
m	0	Pres	Ont	---	-	Jul'70	---
M	5	CATH	ONT	---	-	MAY'71	SCARLET FEVER
F	1	CATH	ONT	---	-	MAY'71	SCARLET FEVER
M	1	CATH	ONT	---	-	JUN'70	SCARLET FEVER
m	14	Cath	Ont	---	-	May'71	brain fever
m	0	Cath	Ont	---	-	Jul'70	cholera
f	10	Cath	Ont	---	-	Feb'71	consumption
m	1	Cath	Ont	---	-	Mar'71	teething
f	36	Cath	U.S.	labourer	m	Oct'70	consumption
f	1	Meth	Ont	---	-	Jan'71	lung fever
M	0	CATH	ONT	CARPENTER	-	MAR'71	SCARLET FEVER
F	0	CATH	ONT	---	-	AUG'70	SCARLET FEVER
M	9	CATH	ONT	---	-	APR'71	SCARLET FEVER
F	5	CATH	ONT	---	-	APR'71	SCARLET FEVER
F	2	CATH	ONT	---	-	APR'71	SCARLET FEVER
m	57	Cath	Ont	farmer	m	Sep'70	lung fever
m	0	Meth	Ont	---	-	Mar'71	infla. bowel
m	1	Pres	Ont	---	-	Feb'71	teething
f	78	CofE	U.S.	---	w	Feb'71	old age
M	11	LUTH	ONT	---	-	JUL'70	SCARLET FEVER
M	2	LUTH	ONT	---	-	JUL'70	SCARLET FEVER

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	32	Cath	U.S.	farmer	m	Jan'71	child birth
				Sub-District K--Windsor			
f	0	Cath	Ont	---	-	Dec'70	diptheria
m	7	Meth	Ont	---	-	Jan'71	inflammation
m	0	Meth	Ont	---	-	Jul'70	cholera
f	6	CofE	Ont	---	-	Dec'70	infla.bowels
f	52	Cath	Ire	---	w	Mar'71	burnt
f	0	Meth	Ont	---	-	Jul'70	consumption
f	2	Cath	Ont	---	-	Aug'70	wh.cough
f	71	X'ian	U.S.	---	w	Dec'70	erysipelas
M	7	METH	ONT	---	-	NOV'70	SCARLET FEVER
M	5	METH	ONT	---	-	NOV'70	SCARLET FEVER
F	2	METH	ONT	---	-	NOV'70	SCARLET FEVER
m	6	Bapt	U.S.	---	-	Oct'70	typhoid fever
m	0	Bapt	Ont	---	-	Aug'70	consumption
m	64	Meth	U.S.	labourer	m	Jun'70	consumption
m	21	Meth	U.S.	labourer	-	Nov'70	unknown in US
m	68	CofE	Eng	---	-	Nov'70	diarrhoea
f	0	Cath	Ont	---	-	Mar'71	diarrhoea
M	10	CATH	ONT	---	-	JUN'70	SCARLET FEVER
f	0	CofE	Ont	---	-	Jan'71	cholera
f	0	CofE	Ont	---	-	Oct'70	unknown
m	0	Cath	Ont	---	-	Dec'70	cholera
m	36	Cath	Ire	saloon keep	m	Dec'70	erysipelas
f	30	CofE	U.S.	---	m	---	child birth
m	21	Cath	Ont	CNR	-	Mar'71	consumption
m	0	CofE	Ont	---	-	May'71	wh. cough
f	2	Cath	Ont	---	-	Mar'71	consumption
f	75	Cath	Ont	---	w	Jun'70	accident
f	2	Cath	U.S.	---	-	Aug'70	cholera
f	12	Meth	Ont	---	-	Oct'70	brain fever
f	0	Cath	Ont	---	-	Jul'70	infla. lungs
m	0	CofE	Ont	---	-	Jun'70	infla. brain
m	15	Meth	Ont	---	-	Apr'71	accident
m	23	Cath	Ont	druggist	-	May'71	burst bl. ves
m	20	Cath	Ont	---	-	???'71	typhoid fever
f	0	Pres	Ont	---	-	Sep'70	debility
f	4	Bapt	Ont	---	-	Mar'71	consumption
m	32	Meth	Eng	---	-	Aug'70	fever
f	28	Meth	Eng	---	-	Aug'70	fever
m	65	Bapt	U.S.	barber	m	Oct'70	rupture
m	52	Bapt	U.S	labourer	-	Nov'70	dropsy
f	0	Cath	Que	---	-	Feb'71	consumption
f	25	Meth	U.S.	---	-	Oct'70	consumption
m	16	CofE	Ont	---	-	Oct'70	consumption
m	54	Cong	Scot	broker	m	Jul'70	paralysis
F	26	CATH	IRE	SEAMSTRESS	-	JUL'70	SCARLET FEVER
m	26	Pres	Ont	---	-	Aug'70	typhoid fever

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	0	CofE	Ont	---	-	Mar'71	typhoid fever
f	2	CofE	Ont	---	-	Sep'70	teething
F	1	COFE	ONT	---	-	NOV'70	SCARLET FEVER
F	6	METH	ONT	---	-	SEP'70	SCARLET FEVER
f	36	Meth	U.S.	seamstress	w	Sep'70	hemmorage
m	2	?	Ont	---	-	Dec'70	croup
m	2	Bapt	Ont	---	-	Aug'70	teething
f	3	Bapt	Ont	---	-	May'71	---
m	2	CofE	Ont	---	-	Jun'70	teething
f	2	CofE	Ont	---	-	Jul'70	fever
m	33	CofE	Eng	miller	m	Jul'70	consumption
f	17	Cath	Ont	---	-	Sep'70	---
m	45	CofE	Eng	hotel keep	m	Nov'70	debility
m	0	?	Ont	---	-	Jun'70	infla. lungs
f	27	?	U.S.	---	-	Jul'70	consumption
f	0	---	Ont	---	-	Jun'70	infla. bowel
F	3	?	ONT	---	-	OCT'70	SCARLET FEVER
m	1	?	Ont	---	-	Jun'70	H2O on brain
f	0	?	Ont	---	-	Jan'71	stillborn
f	0	?	Ont	---	-	Jan'71	stillborn
f	45	?	U.S.	---	w	Sep'70	consumption
f	0	?	Ont	---	-	Aug'70	stillborn
f	1	Meth	Ont	---	-	Aug'70	cholera
f	18	CofE	Ont	---	-	Dec'70	consumption
f	0	CofE	Ont	---	-	Aug'70	teething
F	3	CATH	ONT	---	-	FEB'71	SCARLET FEVER
F	3	?	ONT	---	-	FEB'71	SCARLET FEVER
m	5	Bapt	Ont	---	-	Oct'70	diptheria
f	59	?	U.S.	---	w	Oct'70	paralysis
m	28	?	U.S.	carter	m	Oct'70	typhoid fever
f	0	?	Ont	---	-	May'71	pneumonia
f	27	?	U.S.	masking	-	Jan'71	infla. chest
F	12	?	ONT	---	-	OCT'70	SCARLET FEVER
m	7	CofE	Ont	---	-	Aug'70	diptheria
f	65	?	U.S.	---	-	Nov'70	heart dis.
m	11	?	Ont	---	-	Jun'70	---
f	32	?	U.S.	---	m	Aug'70	---
f	1	?	Ont	---	-	Aug'70	---
f	33	Pres	Eng	---	m	Jun'70	consumption
f	0	Cath	Ont	---	-	Jun'70	summer cough
m	51	Cath	Ire	labourer	m	Sep'70	dropsy
m	42	CofE	Eng	r.r.conduc	m	Jul'70	cholera
f	31	CofE	Ont	---	m	Mar'71	child birth
M	6	METH	ONT	---	-	JUN'70	SCARLET FEVER
F	3	COFE	ONT	---	-	JUN'70	SCARLET FEVER
M	1	COFE	ONT	---	-	JUL'70	SCARLET FEVER
m	5	CofE	Ont	---	-	Dec'70	croup
M	3	COFE	ONT	---	-	MAY'71	SCARLET FEVER
m	33	Pres	Que	r.r. conduc	m	May'71	consumption
f	0	Meth	Ont	---	-	Jul'70	cholera

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
m	72	CofE	Eng	---	m	Dec'70	gravel
m	2	CofE	Eng	---	-	Aug'70	brain fever
f	8	Meth	Ont	---	-	Oct'70	remit. fever
f	5	CofE	Ont	---	-	Nov'70	sore throat
f	65	Cath	Ire	---	w	Oct'70	old age
F	27	CATH	ONT	---	M	APR'71	SCARLET FEVER
f	2	CofE	Ont	---	-	Aug'70	teething
F	5	COFE	ONT	---	-	JUL'70	SCARLET FEVER
M	3	COFE	ONT	---	-	SEP'70	SCARLET FEVER
m	7	Cath	Ont	---	-	Aug'70	paralysis
f	36	Cath	Ont	---	m	Mar'71	bleed lungs
				Sub-District L--Maidstone, township			
m	63	Bapt	Ire	farmer	m	Jul'70	consumption
f	19	Meth	Ont	---	-	Apr'71	consumption
M	14	CATH	ONT	---	-	APR'71	SCARLET FEVER
m	26	Cath	Ont	farmer	-	Feb'71	accident
m	0	---	Ont	---	-	Jun'70	unknown
f	2	Cath	Ont	---	-	Mar'71	unknown
M	23	BAPT	U.S.	???	-	MAR'71	SCARLET FEVER
M	9	BAPT	ONT	---	-	JUL'70	SCARLET FEVER
M	12	CATH	U.S.	---	-	AUG'70	SCARLET FEVER
M	6	CATH	U.S.	---	-	FEB'71	SCARLET FEVER
m	4	CofE	Ont	--	-	Feb'71	accident
f	34	Cath	Ont	---	m	Mar'71	infla. lungs
m	0	---	Ont	---	-	Feb'71	unknown
f	2	Cath	Ont	---	-	Aug'70	dysentery
m	0	Cath	Ont	---	-	Feb'71	unknown
				Sub-District M--Rochester, township			
F	2	CATH	ONT	---	-	MAR'71	SCARLET FEVER
m	70	Cath	Ger	farmer	m	May'71	dropsy
m	0	Cath	Ont	---	-	Jul'70	cholera
f	70	Luth	Ger	--	m	Nov'70	dropsy
F	3	CATH	ONT	---	-	AUG'70	SCARLET FEVER
m	22	Cath	Ont	farmer	-	Jan'71	heart disease
m	0	---	Ont	---	-	Sep'70	unknown
m	10	Prot	Ont	---	-	Aug'70	unknown
f	17	Prot	Ont	---	-	Sep'70	unknown
m	8	Prot	Ont	---	-	Sep'70	unknown
m	11	Prot	Ont	---	-	Sep'70	unknown
f	29	Cath	Ont	---	m	Jul'70	unknown
f	0	Cath	Ont	---	-	Jul'70	unknown
m	63	Cath	Que	???	m	Feb'71	unknown
f	1	Cath	Ont	---	-	Oct'70	infla. bowel
m	0	Cath	Ont	---	-	Jul'70	dysentery
f	60	Cath	Ont	---	m	Jul'70	old age
m	0	---	Ont	---	-	Feb'71	unknown

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
m	44	Cath	Ire	labourer	-	Dec'70	consumption
F	4	CATH	ONT	---	-	JUL'70	SCARLET FEVER
m	6	Cath	Ont	---	-	Aug'70	brain fever
m	0	---	Ont	---	-	Aug'70	unknown
m	15	Cath	Ont	---	-	May'71	paralysis
f	30	Cath	Ont	---	-	Apr'71	consumption
M	4	CATH	ONT	---	-	OCT'70	SCARLET FEVER
f	15	Pres	Ont	---	-	Jul'70	bilious fever
f	25	Cath	Ont	---	m	Oct'70	consumption
m	0	---	Ont	---	-	Jul'70	unknown
m	1	---	Ont	---	-	Jul'70	dysentery
m	6	Cath	Ont	---	-	Oct'70	infla. bowel
f	5	Cath	Ont	---	-	Feb'71	infla. lungs
f	0	---	Ont	---	-	Aug'70	dysentery
f	0	---	Ont	---	-	Aug'70	dysentery
m	0	---	Ont	---	-	Mar'71	sore throat
m	3	---	Ont	---	-	Apr'71	sore throat
				Sub-District N--Tilbury West, township			
m	0	---	Ont	---	-	Mar'71	stillborn
m	0	---	Ont	---	-	Aug'70	---
f	0	---	Ont	---	-	Aug'70	---
m	45	Cath	Que	farmer	m	Dec'70	infla. lungs
M	1	---	ONT	---	-	NOV'70	SCARLET FEVER
m	2	---	Ont	---	-	Dec'70	unknown
m	0	Prot	Ont	---	-	Nov'70	H2O on brain
m	0	Cath	Ont	---	-	Sep'70	diarrhoea
m	32	Pres	Ire	farmer	-	Apr'71	bronchitis
f	1	---	Ont	---	-	Jul'70	infla.
m	28	Cath	Ont	farmer	m	Mar'71	consumption
f	0	Cath	Ont	---	-	Dec'70	H2O on brain
m	0	---	Ont	---	-	Mar'71	unknown
m	2	Cath	Ont	---	-	Aug'70	drowned
m	1	Cath	Ont	---	-	Oct'70	unknown
f	1	Meth	Ont	---	-	Oct'70	croup
m	81	Cath	Ont	farmer	m	Feb'71	---
f	74	Cath	Ont	---	m	Jul'70	paralysis
m	64	Cath	Ont	farmer	m	Oct'70	infla. lungs
f	5	Cath	Ont	---	-	Feb'71	typhoid fever
f	30	Cath	Ont	---	m	May'71	---
m	0	Cath	Ont	---	-	Mar'71	---
M	2	CATH	ONT	---	-	FEB'71	SCARLET FEVER
M	0	CATH	ONT	---	-	FEB'71	SCARLET FEVER
M	2	CATH	ONT	---	-	NOV'70	SCARLET FEVER
F	1	CATH	ONT	--	-	NOV'70	SCARLET FEVER
M	2	CATH	ONT	---	-	DEC'70	SCARLET FEVER
m	2	Cath	Ont	---	-	Jan'71	brain fever
m	0	Cath	Ont	---	-	Sep'70	---
m	0	Cath	Ont	---	-	Aug'70	---

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	37	Cath	Ont	---	m	Apr'71	---
m	16	Cath	Ont	---	-	Sep'70	typhoid fever
M	16	CATH	ONT	---	-	DEC'70	SCARLET FEVER
F	3	CATH	ONT	---	-	DEC'70	SCARLET FEVER
F	2	?	ONT	---	-	DEC'70	SCARLET FEVER
F	1	CATH	ONT	---	-	JAN'71	SCARLET FEVER
m	0	Cath	Ont	---	-	Sep'70	---
M	2	CATH	ONT	---	-	FEB'71	SCARLET FEVER
m	0	---	Ont	---	-	Dec'70	liver complai
f	5	---	Ont	---	-	?	?
m	39	---	Ont	labourer	m	?	---
m	0	---	Ont	---	-	Sep'70	---
m	0	---	Ont	---	-	Apr'71	---
f	2	---	Ont	---	-	Feb'71	---
m	4	---	Ont	---	-	Jun'70	?

APPENDIX C

1870 MANUSCRIPT CENSUS--microfilm #44, roll #4
State of Michigan, Wayne County, City of Detroit,
Mortality Schedule, April 1, 1869-July 31, 1870

* Scarlet fever deaths are highlighted by bold, upper-case print.

Sex	Age	Birth	Occupation	Mar?	Month	Cause
			City of Detroit--Ward One			
f	0	Mich	---	-	May'69	---
m	1	Mich	---	-	Nov'69	typhoid fever
m	74	Mass	blacksmith	m	Oct'69	consumption
f	64	NY	---	m	May'70	anemia
f	27	Eng	---	m	Oct'69	consumption
m	0	Mich	---	-	Sep'69	teething
m	45	Ire	grocer	w	Apr'70	consumption
m	45	Ire	painter	m	May'69	consumption
f	38	Scot	---	m	Apr'70	childbirth
f	33	NY	tailor	m	Apr'69	consumption
m	17	Mich	wagon mkr	-	Apr'70	drowned
m	27	Mich	book keeper	-	Feb'70	typhoid fever
M	**8**	**MICH**	---	-	**DEC'69**	**SCARLET FEVER**
M	**0**	**MICH**	---	-	**JAN'70**	**SCARLET FEVER**
m	23	Mich	telegrapher	-	Jul'69	drowned
m	32	Can	merchant	m	Jan'69	rheumatism
m	79	Scot	---	m	Jun'69	consumption
f	52	NH	---	m	Jun'69	rheumatism
m	6	Mich	---	-	Jun'69	brain fever
f	49	Can	keeping hse	m	Oct'69	heart disease
f	1	Mich	---	-	Aug'69	wh. cough
f	13	Mich	---	-	May'69	consumption
f	35	Mich	---	-	Jan'69	nervous disability
m	6	Mich	---	-	Apr'70	infla. bowels
f	23	NY	keeping hse	m	Oct'69	heart disease
f	0	Mich	---	-	Apr'69	brain disease
m	75	NY	---	m	May'70	dropsy
m	41	NY	store kpr	m	Mar'70	palsy
m	30	Ire	boiler mkr	-	Jun'70	intercep. bowel
f	0	Mich	---	-	Nov'69	fever
f	1	Mich	---	-	Aug'69	teething
f	0	Mich	---	-	Aug'69	canker
M	**0**	**MICH**	---	-	**JUN'70**	**SCARLET FEVER**
m	0	Mich	---	-	Jun'70	diphtheria
f	2	Scot	---	-	Jul'70	---
m	1	Mich	---	-	Jun'70	burn
f	52	Ire	---	m	Jul'69	stomach
m	7	Mich	---	-	Apr'69	kidney disease
f	40	Ire	---	m	Aug'69	childbirth
f	0	Mich	---	-	Aug'69	diarrhoea

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	32	Can	---	m	Jun'70	consumption
			City of Detroit--Ward Two			
f	6	Mich	---	-	Jul'70	typhoid fever
m	59	Scot	clothier	w	Jun'70	consumption
f	59	Scot	keeping hse	m	Nov'69	heart disease
m	40	Prus	cigar maker	m	Jun'70	heart disease
m	2	Mich	---	-	May'70	fall
f	3	Mich	---	-	May'70	H2O on brain
m	2	Mich	---	-	Aug'69	wh. cough
f	0	Mich	---	-	Jan'70	dr. malprac.
m	53	Mich	hotel kpr	m	Apr'70	heart disease
m	0	Ill	---	-	Aug'69	conges. brain
m	0	Mich	---	-	Dec'69	croup
m	0	Mich	---	-	Jun'70	teething
m	0	Mich	---	-	Apr'70	summer complai
m	63	Ire	labourer	m	Jul'69	dysentery
M	7	MICH	---	-	JAN'69	SCARLET FEVER
f	35	Germ	keeping hse	m	Dec'69	childbirth
f	34	Mich	---	-	Jan'69	fall
m	35	Mich	upholsterer	-	Dec'69	heart disease
m	25	Euro	R.R. man	m	Oct'69	drowned
f	27	Euro	straw wkr	-	May'69	erysipelas
f	1	Mich	---	-	Aug'69	wh. cough
m	0	Mich	---	-	Dec'69	diphtheria
m	48	Mich	lawyer	-	Nov'69	apoplexy
m	60	Can	---	-	Apr'69	apoplexy
m	10	Mich	---	-	Aug'69	fall
m	40	Ire	engineer	m	Aug'69	drowned
m	40	Eng	saloon kpr	m	Aug'69	drowned
f	30	Eng	keeping hse	m	Nov'69	insanity
m	37	Germ	hotel kpr	-	Aug'69	delirium
m	50	Amer	saloon kpr	-	Sep'69	delirium
m	43	Ire	sailor	-	Sep'69	drowned
F	1	MICH	---	-	FEB'69	SCARLET FEVER
			City of Detroit--Ward Three			
f	3	Mich	---	-	Aug'69	nervous fever
f	0	Mich	---	-	Sep'69	paralysis
f	33	Can	---	-	Nov'69	consumption
f	14	Ohio	---	-	Apr'70	conges. bowel
f	4	Mich	---	-	Oct'69	diphtheria
F	1	CAN	---	-	JAN'70	SCARLET FEVER
M	5	PENN	---	-	DEC'69	SCARLET FEVER
m	22	NY	---	-	May'70	consumption
m	56	Mich	---	-	Apr'70	conges. lungs
m	40	NY	book kpr	m	Sep'69	consumption
m	1	Mich	---	-	Aug'69	spasms

Sex	Age	Birth	Occupation	Mar?	Month	Cause
m	0	Mich	---	-	Apr'70	spasms
m	64	Penn	---	m	May'70	dropsy--heart
f	19	Penn	---	-	May'70	consumption
f	1	Mich	---	-	Sep'69	dysentery
m	1	Mich	---	-	Mar'70	spasms
f	25	Pola	---	-	May'70	chill fever
m	0	Mich	---	-	Sep'69	teething
f	52	NY	---	m	Nov'69	conges. brain
f	24	Mich	---	-	Sep'69	conges. lungs
f	4	Ohio	---	-	Aug'69	brain fever
M	3	MICH	---	-	DEC'69	SCARLET FEVER
F	1	MICH	---	-	DEC'69	SCARLET FEVER
m	24	Can	---	-	Nov'69	typhoid fever
m	0	Mich	---	-	Apr'70	erysipelas
m	2	Mich	---	-	Mar'70	infla. bowels
f	100	Mich	---	w	Apr'70	old age
m	48	Mich	boiler mkr	w	Jan'70	consumption
f	31	Eng	---	m	Dec'69	paralysis
m	0	Can	---	-	Mar'70	H2O on brain
m	0	Mich	---	-	May'70	sick from birth
f	83	Ire	---	w	Mar'70	old age
f	1	Mich	---	-	Oct'69	dysentery
f	42	Prus	---	m	Oct'69	bronchitis
f	19	Penn	---	-	May'70	consumption

City of Detroit--Ward Four

m	5	Pola	---	-	May'70	explosion
f	0	Ohio	---	-	Jun'69	summer complai.
m	1	Mich	---	-	Apr'70	brain fever
m	0	Mich	---	-	Mar'70	erysipelas
m	2	Mich	---	-	May'70	conges. lungs
m	0	Mich	---	-	Aug'69	summer complai.
F	5	BAVAR	---	-	APR'70	SCARLET FEVER
F	5	MICH	---	-	MAY'70	SCARLET FEVER
m	0	Mich	---	-	Jun'69	H2O on brain
f	0	Mich	---	-	Nov'69	paralysis
m	1	Mich	---	-	Jul'69	summer complai.
m	0	Mich	---	-	Feb'70	cramps
m	0	Mich	---	-	Jul'69	summer complai.
m	0	Mich	---	-	Dec'69	premature birth
m	36	Eng	cigar mkr	m	Jan'70	consumption
m	18	Can	barber	-	Aug'69	consumption
f	1	Mich	---	-	Sep'69	summer complai.
m	1	Mich	---	-	Apr'70	brain fever
m	1	Mich	---	-	Jul'69	spasms
f	1	Mich	---	-	Nov'69	heart disease
m	0	Mich	---	-	Dec'69	palsy
m	1	Mich	---	-	Aug'69	canker
m	0	Mich	---	-	Jan'70	accident

Sex	Age	Birth	Occupation	Mar?	Month	Cause
m	60	Euro	carpenter	m	Jan'70	consumption
m	1	Mich	---	-	Jul'69	H2O on brain
f	0	Mich	---	-	Aug'69	summer complai.
f	3	Mich	---	-	Jul'69	summer complai.
f	0	Mich	---	-	Jul'69	summer complai.
f	11	Mich	---	-	Mar'70	gastric fever
m	1	Mich	---	-	Mar'70	infla. lungs
m	1	Mich	---	-	May'70	wh. cough
m	1	Mich	---	-	Aug'69	summer complai.
m	37	Can	boat eng'r	-	Mar'70	consumption
f	0	Mich	---	-	Jul'69	summer complai.

City of Detroit--Ward Five

m	28	Amste	clthg dlr	m	Jan'70	paralysis
m	11	Eng	---	-	Aug'69	fall
m	47	Ire	keeping hse	m	May'70	neurosis
m	42	Conn	lawyer	w	Nov'69	apoplexy
f	2	Mich	---	-	Aug'69	diarrhoea
m	0	Mich	---	-	Aug'69	H2O on brain
m	9	Mich	---	-	Apr'70	H2O on brain
m	64	Ire	carpenter	m	Aug'69	gastritis
m	0	Mich	---	-	Jan'70	H2O on brain
f	0	Mich	---	-	Aug'69	H2O on brain
m	57	Conn	lawyer	m	Jun'69	heart disease
m	34	Mass	store clerk	m	Aug'69	consumption
m	76	Eng	music tchr	m	Sep'69	infla. bowels
f	19	NY	at home	-	Jan'70	consumption
f	0	Mich	---	-	May'70	infla. brain
f	0	Mich	---	-	Mar'70	convulsions
f	27	NY	keeping hse	m	Sep'69	childbirth
m	0	Mich	---	-	May'70	infla. brain
f	61	Prus	at home	w	May'70	pneumonia
f	22	Eng	at home	-	Sep'69	brain fever
f	36	Ire	keeping hse	m	Jul'69	childbirth
f	60	Eng	at home	w	Aug'69	diarrhoea
m	59	Eng	retired	m	May'70	shot
f	30	Ire	keeping hse	w	Nov'69	dropsy--liver
f	0	Mich	---	-	Oct'69	pneumonia
f	0	Mich	---	-	Jul'69	conges. brain
m	52	Eng	labourer	m	Mar'70	dropsy--heart
m	0	Mich	---	-	May'70	convulsions
m	10	Mich	---	-	Aug'69	typhoid fever
f	6	Mich	---	-	May'70	H2O on brain
f	0	Mich	---	-	Sep'69	dysentery
m	7	Mich	---	-	May'70	consumption
m	48	NY	painter	m	May'70	consumption
m	1	Mich	---	-	Dec'69	H2O on brain
f	65	Ire	---	w	Aug'69	dropsy--heart
f	52	Eng	keeping hse	m	Feb'70	apoplexy

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	1	Mich	---	-	Jul'69	teething
f	35	Can	keeping hse	m	Mar'70	consumption
m	2	Mich	---	-	Jul'69	H2O on brain
f	1	Mich	---	-	Apr'70	conges. lungs
f	53	NY	keeping hse	m	Nov'69	pneumonia
m	0	Mich	---	-	Jul'69	convulsions
m	0	Mich	---	-	May'70	wh. cough
m	62	Conn	farmer	m	Dec'69	infla. bowels
f	62	Eng	keeping hse	m	Oct'69	cancer
f	87	Conn	keeping hse	w	Nov'69	anemia
m	2	Mich	---	-	Mar'70	pneumonia
f	35	Eng	keeping hse	m	May'70	dropsy
m	65	Bavar	miller	w	Apr'70	consumption
f	2	Mich	---	-	Aug'69	conges. bowels
m	3	Mich	---	-	May'70	H2O on brain
m	0	Mich	---	-	Apr'70	premature birth
f	50	Scot	keeping hse	m	Apr'70	brain fever
m	1	Mich	---	-	Jul'69	dysentery
f	47	Scot	keeping hse	m	Sep'69	consumption
f	30	Mass	keeping hse	m	Jan'70	consumption
f	0	Mich	---	-	Mar'70	dysentery
f	0	Mich	---	-	Jun'69	dysentery
m	32	Ire	store clerk	m	Jul'69	conges. brain
f	81	Ire	at home	w	Jul'69	general debility
f	22	Mich	keeping hse	m	Feb'70	erysipelas
m	4	Mich	---	-	Apr'70	conges. brain
m	14	Mich	student	-	Feb'70	pneumonia
f	0	Mich	---	-	May'70	pneumonia
m	79	Ire	labourer	w	Nov'69	general debility
m	0	Mich	---	-	Sep'69	dysentery
m	1	Mich	---	-	Oct'69	H2O on brain
f	1	Mich	---	-	Sep'69	diphtheria
f	1	Mich	---	-	Jan'70	croup
f	24	NY	keeping hse	m	May'70	childbirth
m	1	Mich	---	-	Sep'69	teething
f	84	Ire	at home	w	Oct'69	general debility
m	67	Ire	labourer	m	May'70	bronchitis
f	18	Mass	at home	-	Sep'69	consumption
m	56	Ire	lawyer	m	Dec'69	general debility
f	31	NH	keeping hse	m	Dec'69	consumption
m	85	NH	carpenter	w	Sep'69	general debility
m	60	NY	banker	m	May'70	paralysis
f	0	Mich	---	-	Apr'70	convulsions
f	1	Mich	---	-	Aug'69	conges. bowels
m	45	NY	farmer	m	Sep'69	consumption
f	0	Mich	---	-	Aug'69	cholera
f	39	Ire	keeping hse	m	May'70	puerperal fever
f	4	Mich	---	-	Apr'70	typhoid fever
f	0	Mich	---	-	Aug'69	cholera
m	78	Ire	labourer	m	Jan'70	rheumatism

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	29	NY	keeping hse	m	Aug'69	consumption
m	5	Mich	---	-	Mar'70	typhoid fever
m	70	NY	clergyman	m	Feb'70	brain disease
f	0	Mich	---	-	Apr'70	unknown
m	2	Mich	---	-	May'70	wh. cough
f	51	Scot	keeping hse	m	Sep'69	consumption
f	71	Scot	at home	w	Oct'69	general debility
m	1	Mich	---	-	Nov'69	bronchitis
m	31	Can	bank clerk	-	May'70	consumption
m	6	Mich	---	-	May'70	accident
f	84	NY	at home	w	Nov'69	dropsy--heart
m	42	Mass	messenger	m	Sep'69	typhoid fever
m	0	Mich	---	-	Mar'70	erysipelas
m	60	NY	farmer	m	Oct'69	typhoid fever
f	0	Mich	---	-	Aug'69	convulsions
f	0	Eng	---	-	Jul'70	dysentery
m	0	Mich	---	-	Mar'70	ulcerated throat
f	0	Mich	---	-	Jul'69	dysentery
m	73	Scot	hat cleaner	m	Nov'69	infla. brain
f	64	Scot	keeping hse	m	Jul'69	cholera

City of Detroit--Ward Six, First Precinct

f	0	Mich	---	-	Jan'70	still born
m	2	Mich	---	-	Jan'70	infla. lungs
m	0	Mich	---	-	Mar'70	infla. lungs
m	75	???	---	w	Apr'70	old age
f	0	Mich	---	-	Jun'69	premature birth
m	42	Bavar	stone cut'r	m	Aug'69	consumption
m	0	Mich	---	-	Jul'69	general debility
m	0	Mich	---	-	Jul'69	general debility
m	2	Mich	---	-	Dec'69	infla. lungs
f	3	Mich	---	-	May'70	infla. brain
m	16	Prus	---	-	Aug'70	typhoid fever
f	0	Mich	---	-	Feb'70	still born
m	65	Prus	labourer	m	Jun'69	apoplexy
m	0	Mich	---	-	Jun'69	general debility
m	1	Mich	---	-	Jan'70	fits
m	1	Mich	---	-	May'70	cholera
f	66	Ga	---	w	Mar'70	rheumatism
m	1	Mich	---	-	Sep'69	cholera
m	0	Mich	---	-	Sep'69	wh. cough
f	0	Mich	---	-	May'70	fits
m	1	Mich	---	-	Sep'69	cholera
m	10	Mich	---	-	Jul'69	infla. lungs
f	1	Mich	---	-	Oct'69	cholera
m	66	Can	book kpr	m	Jan'70	heart disease
m	24	Mich	store clerk	-	Apr'70	apoplexy
M	3	MICH	---	-	DEC'69	SCARLET FEVER
f	0	Mich	---	-	Jul'69	brain fever

Sex	Age	Birth	Occupation	Mar?	Month	Cause
m	0	Mich	---	-	Jul'69	cholera
f	0	Mich	---	-	Apr'70	convulsions
m	0	Mich	---	-	Jul'69	cholera
f	0	Mich	---	-	May'70	premature birth
m	0	Mich	---	-	Aug'69	general debility
m	0	Mich	---	-	Jul'69	general debility
f	0	Mich	---	-	Jul'69	cholera
m	0	Mich	---	-	Dec'69	debility
f	0	Mich	---	-	Dec'69	wh. cough
m	0	Mich	---	-	Jan'70	bowel disease
f	64	Ire	---	m	Jun'69	erysipelas
F	1	MICH	---	-	APR'70	SCARLET FEVER
m	1	NY	---	-	Aug'69	cholera
m	65	Baden	labourer	m	Feb'70	apoplexy
m	0	Mich	---	-	Jul'69	cholera
m	0	Maine	---	-	Jun'69	general debility
m	0	Maine	---	-	Jun'69	general debility
m	4	Mich	---	-	Jun'69	brain fever
m	49	NY	merchant	m	Oct'69	paralysis
f	0	Mich	---	-	Nov'69	diphtheria
f	7	Can	---	-	Apr'70	brain fever
m	39	NY	boot dealer	m	May'70	consumption
m	69	Vt	lumber dlr	m	Jul'69	infla. kidney
f	82	Ire	---	w	Aug'69	old age
f	2	Can	---	-	Jul'69	cholera
m	40	Scot	car'ge mkr	m	Nov'69	consumption
m	0	Mich	---	-	Oct'69	still born
m	10	Mich	---	-	Aug'69	infla. bowels
f	0	Mich	---	-	Jul'69	cholera
f	0	Mich	---	-	Apr'70	erysipelas
m	49	NY	lawyer	m	Jan'70	consumption
m	22	NY	---	-	Jan'70	heart disease
m	4	Mich	---	-	Aug'69	infla. bowels
m	58	NY	grocer	m	May'70	infla. lungs
m	75	Md	farmer	m	May'70	old age
f	32	Md	---	m	Jan'70	consumption
f	32	NY	---	m	May'70	infla. bowels
f	2	Mich	---	-	Jun'69	consumption
m	0	Mich	---	-	Feb'70	consumption
m	1	Mich	---	-	Feb'70	wounds
m	1	Mich	---	-	Oct'69	cholera
f	69	Mass	---	w	Sep'69	paralysis
f	0	Mich	---	-	Dec'69	erysipelas
f	1	Mich	---	-	Aug'69	cholera
f	1	Mich	---	-	Aug'69	cholera
m	66	Scot	labourer	m	Apr'70	dropsy
m	37	Can	pattern mkr	m	Jan'70	consumption
F	15	EURO	---	-	MAR'70	SCARLET FEVER
F	5	MICH	---	-	MAY'70	SCARLET FEVER
f	9	NY	---	-	Oct'69	consumption

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	54	Mich	---	m	Feb'70	dropsy
f	67	Mich	---	w	Mar'70	paralysis
m	0	Mich	---	-	Jul'69	still born
f	30	Penn	---	m	Jun'69	paralysis
f	25	Mich	---	-	Jun'69	child bed
m	50	Mich	miner	w	Sep'69	cancer
m	55	Mich	brick mason	w	Sep'69	paralysis
m	40	Ire	---	-	Sep'69	paralysis
m	35	Eng	book kpr	-	Sep'69	tuberculosis
m	55	Eng	---	-	Nov'69	delirium
m	60	Scot	saloon kpr	-	Nov'69	delirium
m	36	Mich	---	-	Dec'69	consumption
m	23	Can	labourer	-	Dec'69	fract'd skull
m	37	Prus	labourer	-	Mar'70	burned
f	40	Scot	---	-	Mar'70	consumption
m	60	Mich	merchant	-	Mar'70	lung disease
m	30	Can	---	-	Mar'70	consumption
m	37	NY	---	m	Apr'70	consumption
m	51	NY	---	-	Apr'70	consumption
f	81	Maine	---	-	Apr'70	old age
m	37	Mich	---	-	Jun'69	paralysis
m	59	Mich	---	-	Apr'70	consumption
f	33	Eng	---	-	May'70	consumption
m	37	Eng	---	-	May'70	consumption
m	4	Mich	---	-	Sep'69	wounds

City of Detroit--Ward Six, Second Precinct

f	0	Mich	---	-	Aug'69	dropsy--heart
f	80	Can	---	w	Aug'69	consumption
f	10	Bohem	---	-	Oct'69	consumption
f	0	Mich	---	-	Sep'69	diarrhoea
m	0	Can	---	-	May'70	diarrhoea
m	0	Mich	---	-	Jul'69	diarrhoea
f	0	Mich	---	-	Mar'70	diarrhoea
m	0	Mich	---	-	Nov'69	diarrhoea
f	0	Mich	---	-	Aug'69	diarrhoea
f	0	Mich	---	-	Jul'69	diarrhoea
m	0	Mich	---	-	Sep'69	bronchitis
f	55	Ire	keeping hse	w	Feb'70	consumption
f	9	Mich	---	-	Aug'69	typhoid fever
f	20	Scot	servant	-	Apr'70	consumption
m	66	Wurte	carpenter	m	Nov'69	consumption
f	0	Prus	---	-	Jul'69	diarrhoea
f	5	Mich	---	-	Aug'69	typhoid fever
m	51	Miss	hotel cook	m	Sep'69	consumption
m	14	Mich	---	-	Aug'69	bowel disease
f	0	Mich	---	-	Oct'69	diarrhoea
f	0	Mich	---	-	Apr'70	diarrhoea
f	53	Prus	keeping hse	m	Jul'69	heart disease

Sex	Age	Birth	Occupation	Mar?	Month	Cause
m	31	Ire	labourer	-	Sep'69	consumption
m	6	Mich	---	-	May'70	consumption
f	10	Can	---	-	Apr'70	consumption
f	0	Mich	---	-	Sep'69	diarrhoea
f	12	Mich	---	-	May'70	consumption
m	3	Mich	---	-	Mar'70	cholera
f	24	Can	washer	-	Oct'69	consumption
m	1	Mich	---	-	Oct'69	cholera
f	0	Mich	---	-	Oct'69	diarrhoea
m	66	Can	goldsmith	m	Apr'70	dropsy--chest
f	0	Mich	---	-	Apr'70	diarrhoea
f	2	Mich	---	-	Aug'69	dysentery
m	24	Mich	painter	m	Aug'69	consumption
m	0	Mich	---	-	Jul'69	diarrhoea
m	0	Mich	---	-	Dec'69	diarrhoea
m	2	Mich	---	-	Nov'69	bronchitis
m	1	Mich	---	-	Aug'69	diarrhoea
f	20	Iowa	servant	-	Mar'70	consumption
m	0	Md	---	-	Jan'70	diarrhoea
m	0	Mich	---	-	Oct'69	diarrhoea
m	0	Mich	---	-	Sep'69	diarrhoea
m	42	Bavar	stonemason	m	Sep'69	spine disease
f	4	Mich	---	-	Jul'69	infla. brain
m	1	Mich	---	-	Sep'69	cholera
f	0	Mich	---	-	Aug'69	diarrhoea
m	44	Ohio	boat cook	m	Mar'70	consumption
m	2	Mich	---	-	Jan'70	diarrhoea
m	4	Can	---	-	Aug'69	bronchitis
f	0	Mich	---	-	Sep'69	diarrhoea
m	0	Mich	---	-	Jul'69	dysentery
f	0	Mich	---	-	May'70	diarrhoea
f	30	Prus	keeping hse	m	Jul'69	consumption
m	50	Ky	brickmason	m	Oct'69	heart disease
f	46	Prus	keeping hse	m	Jul'69	dropsy--heart
m	38	Prus	carpenter	m	Jul'69	consumption
m	1	Mich	---	-	Aug'69	infla. brain
f	1	Mich	---	-	Sep'69	diarrhoea
m	0	Mich	---	-	Oct'69	bronchitis
m	0	Mich	---	-	Aug'69	diarrhoea
m	58	Bavar	labourer	m	Aug'69	consumption
f	1	Can	---	-	Sep'69	lung disease
f	50	NY	keeping hse	-	May'70	consumption
m	0	Mich	---	-	Apr'70	diarrhoea
f	28	Prus	keeping hse	m	Mar'70	chest disease
f	0	Mich	---	-	Dec'69	bowel disease
m	1	Mich	---	-	Dec'69	diarrhoea
f	65	Prus	keeping hse	w	Mar'70	dropsy--chest
m	72	Nurem	teamaster	m	Sep'69	typhoid fever
m	72	Mich	---	-	May'70	diarrhoea
m	0	Mich	---	-	Jul'69	diarrhoea

Sex	Age	Birth	Occupation	Mar?	Month	Cause
m	70	Prus	labourer	w	Nov'69	infla. bowels
m	0	Mich	---	-	Oct'69	diarrhoea
f	51	Switz	keeping hse	m	May'70	infla. liver
m	1	Mich	---	-	Sep'69	diarrhoea
m	1	Mich	---	-	Jul'69	diarrhoea
m	4	Mich	---	-	Nov'69	bronchitis
m	1	Mich	---	-	Nov'69	bronchitis
m	0	Mich	---	-	Jun'69	diarrhoea
f	1	Mich	---	-	Jul'69	bowel disease
f	0	Mich	---	-	Jan'70	diarrhoea
m	23	Prus	butcher	-	Feb'70	infla. brain
f	0	Mich	---	-	Mar'70	infla. bowels
m	0	Mich	---	-	Jun'69	infla. brain
m	0	Mich	---	-	Mar'70	diarrhoea
m	1	Mich	---	-	May'70	diarrhoea
m	71	Prus	labourer	w	May'70	dropsy--heart
m	1	Mich	---	-	Aug'69	diarrhoea
m	1	Prus	---	-	Sep'69	cholera
m	0	Mich	---	-	Nov'69	diarrhoea
f	23	Ky	washwoman	-	Oct'69	consumption
m	50	Ire	labourer	-	Sep'69	intemperance
m	18	Ohio	labourer	-	Sep'69	consumption
m	60	NY	carpenter	-	May'70	consumption

City of Detroit--Ward Seven

M	0	MICH	---	-	MAY'70	SCARLET FEVER
f	0	Can	---	-	Aug'69	bilious fever
f	2	Mich	---	-	Jun'69	cholera
m	2	Mich	---	-	Sep'69	cholera
f	80	Prus	---	m	Nov'69	weakness
f	0	Mich	---	-	May'70	infla. bowels
f	56	NY	---	w	May'70	lung disease
F	0	MICH	---	-	JAN'70	SCARLET FEVER
m	1	Mich	---	-	Apr'70	infla. lungs
m	38	Mich	labourer	m	Nov'69	typhoid fever
f	49	Mich	keeping hse	m	Nov'69	typhoid fever
f	73	Mich	---	w	Mar'70	cancer
f	0	Mich	---	-	Dec'69	H2O on brain
M	2	MICH	---	-	OCT'69	SCARLET FEVER
f	34	Mich	---	w	Mar'70	typhoid fever
m	65	NY	merchant	m	Nov'69	consumption
m	49	Ire	lawyer	m	Apr'70	heart disease
f	56	Mich	keeping hse	w	Jan'70	consumption
m	0	Mich	---	-	Dec'69	weakness
m	0	Mich	---	-	Dec'69	weakness
f	0	Mich	---	-	Nov'69	conges. brain
m	36	Va	waiter	-	Apr'70	smallpox
f	0	Mich	---	-	May'70	consumption
f	1	Mich	---	-	Jan'70	consumption

Sex	Age	Birth	Occupation	Mar?	Month	Cause
m	21	Mich	carpenter	-	May'70	heart disease
F	3	MICH	---	-	FEB'70	SCARLET FEVER
M	0	MICH	---	-	APR'70	SCARLET FEVER
m	15	Ire	---	-	Jan'70	consumption
f	30	Mich	keeping hse	m	Jun'69	consumption
f	14	Mich	---	-	Jun'69	typhoid fever
m	6	Mich	---	-	Aug'69	typhoid fever
f	3	Mich	---	-	Jun'69	summer complai.
f	0	Mich	---	-	Jul'69	summer complai.
m	54	Va	white wash	m	Oct'69	heart disease
m	49	Saxon	labourer	m	Dec'69	dropsy
m	24	Saxon	tinsmith	-	Feb'70	typhoid fever
m	54	Bavar	tanner	m	Sep'69	consumption
m	46	Prus	grocer	m	Aug'69	consumption
f	1	Mich	---	-	Jun'69	summer complai.
m	62	Fra	teamaster	m	May'70	consumption
f	7	NY	---	-	Jul'69	consumption
m	73	Holl	labourer	m	Nov'69	weakness
m	42	Saxon	carpenter	m	Jul'69	dropsy
f	65	Holl	---	m	Jun'69	consumption
F	7	MICH	---	-	JUN'69	SCARLET FEVER
f	1	Mich	---	-	Aug'69	summer complai.
f	0	Mich	---	-	Jun'69	summer complai.
f	0	Mich	---	-	Jul'69	brain disease
m	0	Mich	---	-	Nov'69	measles
m	2	Mich	---	-	Dec'69	typhoid fever
m	1	Mich	---	-	May'70	summer complai.
f	0	Mich	---	-	Nov'69	weakness
m	1	Mich	---	-	Aug'69	summer complai.
m	0	Mich	---	-	Mar'70	dropsy
F	4	MICH	---	-	JUN'69	SCARLET FEVER
F	2	MICH	---	-	JUN'69	SCARLET FEVER
m	41	Prus	cigar maker	m	Apr'70	typhoid fever
m	2	Mich	---	-	Jun'69	summer complai.
m	1	Mich	---	-	Aug'69	heart disease
f	70	Bavar	---	w	Sep'69	dropsy

City of Detroit--Ward Eight

m	1	Mich	---	-	Sep'69	cholera
f	51	Scot	keeping hse	m	Feb'70	aneurism
f	20	NY	---	-	Feb'70	convulsions
m	73	Ire	stone mason	w	Aug'69	consumption
f	2	Mich	---	-	Dec'69	burned
m	35	Ire	grocer	-	Aug'69	apoplexy
m	35	Ire	labourer	w	Feb'70	fever
f	18	Mich	---	-	Jun'69	consumption
m	30	Eng	engine bldr	-	May'70	drowned
m	12	Can	---	-	Jul'69	accident
f	26	Mich	keeping hse	m	Jul'69	consumption

Sex	Age	Birth	Occupation	Mar?	Month	Cause
m	2	Mich	---	-	May'70	convulsions
m	1	Mich	---	-	Jan'70	infla. bowels
f	20	Mich	---	-	Sep'69	typhoid fever
m	3	Mich	---	-	Aug'69	measles
m	1	Mich	---	-	Jul'69	diarrhoea
m	5	Mich	---	-	May'70	infla. brain
m	55	Ire	labourer	-	Feb'70	contusion
f	2	Mich	---	-	Jul'69	wh. cough
m	0	Mich	---	-	Sep'69	birth
m	4	Mich	---	-	Jun'69	measles
f	33	Ire	keeping hse	m	Jan'70	conges. lungs
m	2	Mich	---	-	Jan'70	unknown
m	0	Mich	---	-	Oct'69	diarrhoea
f	24	Ire	---	-	Jun'69	fever
f	0	Mich	---	-	Aug'69	conges. brain
m	0	Mich	---	-	May'70	still born
f	1	Mich	---	-	Aug'69	cholera
m	1	Mich	---	-	Sep'69	cholera
m	1	Eng	---	-	Aug'69	cholera
m	34	Can	carpenter	-	Oct'69	typhoid fever
f	0	Mich	---	-	Feb'70	birth
m	21	Baden	painter	-	Apr'70	consumption
m	51	Scot	carpenter	m	Aug'69	accident
m	6	Mich	---	-	Dec'69	wh. cough
f	0	Mich	---	-	May'70	convulsions
f	2	Mich	---	-	Aug'69	diarrhoea
m	52	Ire	labourer	m	May'70	hepatitis
m	36	Ire	labourer	m	Apr'70	erysipelas
M	0	MICH	---	-	MAR'70	SCARLET FEVER
f	80	Ire	---	w	Feb'70	general debility
m	33	Ire	engine bldr	m	Mar'70	consumption
f	2	Mich	---	-	Feb'70	conges. lungs
f	65	Ire	---	w	Feb'70	cancer
f	0	Mich	---	-	Jan'70	cholera
f	1	Mich	---	-	Jun'69	cholera
f	48	Ire	keeping hse	m	Apr'70	consumption
f	0	Mich	---	-	Jan'70	cholera
m	0	Mich	---	-	Aug'69	typhoid fever
m	0	Mich	---	-	Jun'69	still born
f	0	Mich	---	-	Feb'70	typhoid fever
f	1	Mich	---	-	Aug'69	infla. brain
m	34	Ire	plumber	-	Apr'70	accident
f	23	Ire	---	m	May'70	aneurism
m	7	Mich	---	-	Sep'69	brain fever
m	0	Mich	---	-	Jun'69	wh. cough
f	2	Mich	---	-	Jun'69	wh. cough
m	50	NY	merchant	m	Nov'69	rheumatism
f	98	Ire	---	w	Dec'69	general debility
f	75	Ire	---	w	Jun'69	dropsy--heart
F	2	MICH	---	-	MAY'70	SCARLET FEVER

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	75	Eng	music tchr	w	May'70	cancer
f	14	Can	---	-	Mar'70	infla. brain
f	1	Mich	---	-	Mar'70	cholera
f	0	Mich	---	-	Oct'69	convulsions
f	18	Can	keeping hse	m	Sep'69	typhoid fever
f	36	Eng	keeping hse	m	Jan'70	diarrhoea
m	4	Can	---	-	Apr'70	conges. lungs
f	0	Mich	---	-	Apr'70	wh. cough
m	50	Ire	carpenter	m	Dec'69	consumption
f	0	Mich	---	-	Jan'70	birth
f	83	Ire	keeping hse	w	Nov'69	rheumatism
M	3	MICH	---	-	DEC'69	SCARLET FEVER
m	0	Mich	---	-	Mar'70	birth
f	53	NY	keeping hse	m	Aug'69	consumption
m	1	Mich	---	-	Aug'69	cholera
m	0	Mich	---	-	Jan'70	birth
m	20	Mich	???	-	Mar'70	consumption
f	0	Mich	---	-	Apr'70	wh. cough
f	7	Mich	---	-	Jun'69	typhoid fever
f	0	Mich	---	-	Jan'70	ill from birth
f	70	Prus	---	w	Oct'69	general debility
f	32	Prus	keeping hse	m	Jul'69	dropsy--heart
m	1	Mich	---	-	Jan'70	diphtheria
f	15	Mich	---	-	Nov'69	consumption
f	0	Can	---	-	Oct'69	pneumonia
m	0	Mich	---	-	Nov'69	still born
m	58	Bavar	labourer	m	Nov'69	erysipelas
m	0	Mich	---	-	Apr'70	pneumonia
m	45	Ire	huckster	m	May'70	cancer
m	0	Mich	---	-	Feb'70	birth
f	0	Mich	---	-	Jul'69	cholera
m	0	Mich	---	-	Sep'69	still born
f	0	Mich	---	-	Jun'69	dropsy--brain
m	0	Mich	---	-	Dec'69	birth
m	24	Mich	R.R. eng'r	-	Dec'69	accident
m	0	Mich	---	-	Sep'69	wh. cough

City of Detroit--Ward Nine

m	52	Ire	labourer	m	Feb'70	consumption
m	56	Ire	brick mason	m	Jun'69	infla. bowel
m	34	Austr	saloon kpr	m	Aug'69	infla. lungs
m	0	Mich	---	-	Mar'70	infla. bowel
M	4	MICH	---	-	MAY'70	SCARLET FEVER
f	18	Mich	---	-	Dec'69	dropsy--heart
f	43	Ire	keeping hse	m	Mar'70	aneurism
f	1	Mich	---	-	Jul'69	diarrhoea
m	64	Can	---	m	Sep'69	infla. bowel
m	9	Mich	---	-	Apr'70	hip disease
f	1	Mich	---	-	Dec'69	infla. bowel

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	7	Mich	---	-	Feb'70	consumption
m	0	Mich	---	-	Aug'69	cholera
m	18	Mich	painter	-	Mar'70	throat disease
f	24	Ire	---	-	Jun'69	consumption
f	1	Mich	---	-	Dec'69	H2O on brain
f	14	Mich	---	-	Feb'70	spine disease
f	68	NY	keeping hse	m	Oct'69	aneurism
f	2	Mich	---	-	Sep'69	typhoid fever
f	0	Mich	---	-	Sep'69	cholera
f	34	Ire	keeping hse	m	Sep'69	fever
f	59	Bavar	keeping hse	m	Apr'70	infla. lungs
f	19	Can	---	-	May'70	poison
m	0	Mich	---	-	Sep'69	wh. cough
f	35	Mass	keeping hse	m	Jun'69	aneurism
m	0	Mich	---	-	Nov'69	diphtheria
m	0	Mich	---	-	Mar'70	cholera
f	1	Mich	---	-	Aug'69	diphtheria
m	7	NY	---	-	Oct'69	bowel disease
f	1	Mich	---	-	Aug'69	diarrhoea
m	0	Mich	---	-	Apr'70	cholera
m	0	Mich	---	-	Jul'69	cholera
m	0	Mich	---	-	Jul'69	cholera
m	15	Mich	---	-	Nov'69	bilious fever
m	0	Mich	---	-	Oct'69	unknown
f	80	Can	keeping hse	w	Sep'69	consumption
f	0	Mich	---	-	Aug'69	infla. bowel
m	0	Mich	---	-	May'70	cholera
m	72	Ire	labourer	m	Jan'70	asthma
f	1	Mich	---	-	Oct'69	cholera
m	1	Mich	---	-	Jul'69	consumption
f	14	Mich	---	-	Sep'69	infla. lungs
m	63	Mich	---	m	Nov'69	consumption
f	70	Ire	---	w	Oct'69	dropsy
m	0	Mich	---	-	Mar'70	cholera
f	61	NY	---	m	Nov'69	consumption
m	0	Mich	---	-	Jan'70	cholera
f	0	Mich	---	-	Feb'70	H2O on brain
m	43	Can	---	m	Jun'69	bronchitis
m	5	Can	---	-	Oct'69	bilious fever
f	0	Mich	---	-	Feb'70	cholera
f	30	Ire	---	m	Mar'70	consumption
m	0	Mich	---	-	Apr'70	ill from birth
m	8	Mich	---	-	Aug'69	snake bite
f	0	Mich	---	-	Sep'69	cholera
m	0	Mich	---	-	Dec'69	still born
f	16	Mich	---	-	Apr'70	consumption
m	8	Mich	---	-	Jan'70	aneurism
f	22	Bavar	keeping hse	m	Sep'69	consumption
m	0	Mich	---	-	Jul'69	diarrhoea
f	1	Mich	---	-	Oct'69	dysentery

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	18	Mich	---	-	Oct'69	typhoid fever
f	6	NY	---	-	Feb'70	typhoid fever
m	48	Holl	moulder	m	Apr'70	consumption
f	5	Mich	---	-	Nov'69	croup
m	20	Russ	labourer	m	Mar'70	consumption
M	5	MICH	---	-	MAY'70	SCARLET FEVER
m	77	Penn	painter	w	Sep'69	general debility
f	42	Ire	keeping hse	m	Mar'70	consumption
f	7	Mich	---	-	Mar'70	brain fever
m	1	Mich	---	-	Aug'69	diarrhoea
M	13	CAN	---	-	MAR'70	SCARLET FEVER
f	0	Mich	---	-	Jul'69	diarrhoea
f	33	Eng	---	m	Oct'69	consumption
f	77	Can	---	w	Nov'69	aneurism
M	0	MICH	---	-	AUG'69	SCARLET FEVER
f	76	Mich	---	w	Sep'69	bladder disease
m	0	Mich	---	-	Jun'69	cholera
f	80	Can	---	w	Oct'69	consumption
m	19	NY	plasterer	-	Feb'70	consumption
m	1	Mich	---	-	Apr'70	consumption
f	8	Mich	---	-	Jul'69	wh. cough
f	4	Mich	---	-	Jan'70	wh. cough
f	2	Mich	---	-	Feb'70	measles
m	1	Mich	---	-	Oct'69	unknown
f	1	Mich	---	-	Mar'70	infla. lungs
m	0	Mich	---	-	Aug'69	still born
m	75	Eng	lapidary	w	Jul'69	kidney disease
m	0	Mich	---	-	Feb'70	cholera
m	0	Mich	---	-	Aug'69	cholera
f	87	Scot	---	w	May'70	consumption
M	3	HOLL	---	-	NOV'69	SCARLET FEVER
f	32	Ire	---	m	Nov'69	consumption
f	21	Bavar	---	m	Jan'70	child birth
m	15	Mich	---	-	Feb'70	consumption
f	0	Mich	---	-	May'70	still born
m	11	Mich	---	-	Sep'69	diarrhoea
m	0	Mich	---	-	Aug'69	cholera
m	1	Mich	---	-	Oct'69	cholera
m	2	Mich	---	-	Apr'70	cholera
f	13	Mich	---	-	Jan'70	typhoid fever
m	0	Mich	---	-	Jul'69	cholera
f	34	Ire	keeping hse	m	Feb'70	child birth
f	0	Mich	---	-	May'70	cholera
f	0	Mich	---	-	Jun'69	cholera
f	0	Mich	---	-	Jul'69	cholera
m	27	Prus	miller	m	Oct'69	drowned
f	8	Mich	---	-	Feb'70	wh. cough
m	0	Mich	---	-	Jun'69	cholera
f	0	Mich	---	-	Jul'69	cholera
m	24	Can	labourer	-	Sep'69	typhoid fever

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	3	Mich	---	-	Jun'69	measles
m	1	Mich	---	-	Jan'70	measles
F	6	MICH	---	-	JUL'69	SCARLET FEVER
f	0	Mich	---	-	Jan'70	unknown
m	3	Mich	---	-	Apr'70	scrofula
f	0	Can	---	-	May'70	wh. cough
m	19	Austr	labourer	-	Jul'69	accident
m	45	Prus	tailor	m	Nov'69	aneurism
f	0	Mich	---	-	Dec'69	still born
f	80	Ire	---	w	Oct'69	general debility
m	0	Mich	---	-	Jun'69	wh. cough
m	0	Mich	---	-	Jun'69	ill from birth
m	2	Mich	---	-	Sep'69	croup
m	0	Mich	---	-	Aug'69	cholera
m	0	Mich	---	-	Apr'70	bowel disease
m	59	Ire	labourer	m	Nov'69	consumption
m	0	Mich	---	-	Dec'69	ill from birth
m	44	Ire	farmer	m	Oct'69	spine disease
m	3	Mich	---	-	Dec'69	convulsions
m	3	Mich	---	-	Dec'69	croup
f	0	Mich	---	-	Dec'69	cholera
f	0	Mich	---	-	Aug'69	cholera
m	0	Mich	---	-	Aug'69	cholera
f	2	Mich	---	-	Aug'69	cholera
f	3	Mich	---	-	May'70	cholera
f	0	Mich	---	-	Aug'69	cholera
m	0	Mich	---	-	Jun'69	cholera
f	39	Prus	---	m	Jun'69	child birth
m	0	Mich	---	-	Jun'69	ill from birth
m	77	Prus	labourer	w	Nov'69	consumption
m	0	Mich	---	-	Mar'70	cholera
m	0	Mich	---	-	Apr'70	ill from birth
f	1	Mich	---	-	Sep'69	cholera
f	0	Mich	---	-	Aug'69	cholera
f	0	Mich	---	-	Aug'69	cholera
f	65	Prus	---	m	Nov'69	dropsy
m	0	Mich	---	-	Nov'69	cholera
m	0	Mich	---	-	Aug'69	cholera
m	1	Mich	---	-	Jul'70	cholera
m	0	Mich	---	-	Nov'69	still born
f	39	Ire	---	m	Sep'69	diarrhoea
f	0	Mich	---	-	Aug'69	ill from birth
m	0	Mich	---	-	Jan'70	cholera
f	1	Mich	---	-	Nov'69	cholera
m	55	Can	carpenter	m	May'70	general debility
m	80	Prus	labourer	w	Jan'70	asthma
f	57	NY	---	w	Dec'69	hepatitis
f	0	Mich	---	-	Nov'69	still born
m	6	Can	---	-	Aug'69	cholera
m	0	Mich	---	-	Aug'69	H2O on brain

Sex	Age	Birth	Occupation	Mar?	Month	Cause
m	0	Mich	---	-	Feb'70	still born
m	2	Mich	---	-	Dec'69	diarrhoea
m	44	Ire	labourer	m	Dec'69	murdered
f	48	Ire	keeping hse	m	Feb'70	consumption
m	0	Mich	---	-	Oct'69	still born
m	1	Mich	---	-	Sep'69	cholera
f	4	Mich	---	-	Mar'70	convulsions
f	0	Mich	---	-	Feb'70	ill from birth
f	82	Ire	---	w	Aug'69	dysentery
f	13	Wales	---	-	Jul'69	infla. bowels
m	0	Mich	---	-	Jan'70	still born
m	60	Ire	labourer	w	Apr'70	consumption
m	74	Eng	tailor	w	Jan'70	kidney disease
f	0	Mich	---	-	Jul'69	cholera
f	0	Mich	---	-	Nov'69	debility
m	3	Mich	---	-	Nov'69	conges. brain
f	0	Mich	---	-	Mar'70	wh. cough
f	0	Mich	---	-	Sep'69	debility
f	60	Vt	---	w	Jan'70	bilious fever
f	64	Mich	---	m	Feb'70	consumption

City of Detroit--Ward Ten

F	7	MICH	---	-	NOV'69	SCARLET FEVER
F	4	MICH	---	-	NOV'69	SCARLET FEVER
F	2	MICH	---	-	NOV'69	SCARLET FEVER
m	0	Mich	---	-	Feb'70	birth
m	1	Can	---	-	Dec'69	teething
f	49	Ire	keeping hse	m	May'70	infla. brain
f	25	Can	at home	m	Apr'70	consumption
m	0	Mich	---	-	May'70	birth
F	7	NY	---	-	MAY'70	SCARLET FEVER
F	4	NY	---	-	APR'70	SCARLET FEVER
m	0	Mich	---	-	May'70	birth
m	0	Mich	---	-	Feb'70	birth
f	0	Mich	---	-	Jan'70	birth
F	6	MICH	---	-	NOV'69	SCARLET FEVER
F	4	MICH	---	-	DEC'69	SCARLET FEVER
m	0	Mich	---	-	Nov'69	fits
F	3	MICH	---	-	MAY'70	SCARLET FEVER
M	4	MICH	---	-	MAR'70	SCARLET FEVER
M	2	MICH	---	-	MAR'70	SCARLET FEVER
F	5	MICH	---	-	JAN'70	SCARLET FEVER
F	0	MICH	---	-	DEC'69	SCARLET FEVER
M	1	MICH	---	-	DEC'69	SCARLET FEVER
m	33	Mich	---	m	Dec'69	shot
m	0	Mich	---	-	Jul'69	birth
f	0	Mich	---	-	Aug'69	summer complai.
m	1	Mich	---	-	Aug'69	infla. brain
f	1	Mich	---	-	Dec'69	teething

Sex	Age	Birth	Occupation	Mar?	Month	Cause
M	1	CAN	---	-	MAR'70	SCARLET FEVER
m	0	Mich	---	-	Aug'69	cancer
m	0	Mich	---	-	May'70	brain fever
F	5	CAN	---	-	SEP'69	SCARLET FEVER
f	0	Mich	---	-	Aug'69	birth
F	1	MICH	---	-	MAY'70	SCARLET FEVER
M	4	MICH	---	-	FEB'70	SCARLET FEVER
M	2	MICH	---	-	FEB'70	SCARLET FEVER
f	29	Eng	keeping hse	m	Oct'69	unknown
M	2	CAN	---	-	JAN'70	SCARLET FEVER
m	74	Can	---	m	Nov'69	dropsy
m	43	Fra	---	m	Jan'70	liver complai.
M	3	MICH	---	-	OCT'69	SCARLET FEVER
m	0	Mich	---	-	Nov'69	birth
m	26	Ire	labourer	-	Dec'69	heart disease
f	77	Eng	at home	w	Jan'70	consumption
F	1	MICH	---	-	MAR'70	SCARLET FEVER
f	0	Mich	---	-	Aug'69	summer complai.
m	1	Mich	---	-	Sep'69	teething
m	1	Mich	---	-	Oct'69	teething
f	0	Mich	---	-	Feb'70	birth
f	45	Can	keeping hse	m	Mar'70	consumption
m	57	Can	carpenter	m	May'70	cancer
f	48	Prus	keeping hse	m	Feb'70	heart disease
M	0	MICH	---	-	MAY'70	SCARLET FEVER
m	0	Mich	---	-	Jul'69	birth
m	0	Mich	---	-	Dec'69	fits
f	51	Saxon	---	m	Dec'69	???
m	23	Wurte	labourer	-	Aug'69	consumption
f	1	Mich	---	-	Sep'69	wh. cough
f	1	Mich	---	-	Jul'69	summer complai.
m	0	Mich	---	-	Jul'69	summer complai.
f	1	Mich	---	-	Sep'69	summer complai.
m	0	Mich	---	-	Aug'69	summer complai.
m	1	Mich	---	-	Sep'69	summer complai.
f	24	Mich	at home	-	Jun'69	consumption
f	1	Mich	---	-	Oct'69	summer complai.
m	22	Can	labourer	-	Sep'69	typhoid fever
m	0	Mich	---	-	Aug'69	summer complai.
f	0	Mich	---	-	Aug'69	summer complai.
f	0	Mich	---	-	May'70	birth
f	44	Saxon	keeping hse	m	Dec'69	confinement
f	1	Mich	---	-	Nov'69	brain fever
m	0	Mich	---	-	Mar'70	infla. lungs
f	0	Mich	---	-	May'70	birth
f	2	Mich	---	-	Nov'69	summer complai.
f	0	Mich	---	-	Apr'70	teething
m	0	Mich	---	-	Jul'69	fits
m	1	Mich	---	-	Mar'70	infla. lungs
f	1	Mich	---	-	Mar'70	wh. cough

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	50	Can	keeping hse	m	Sep'69	consumption
m	7	Mich	---	-	Aug'69	summer complai.
F	4	CAN	---	-	MAY'70	SCARLET FEVER
f	58	Mich	keeping hse	m	Mar'70	old age
m	0	Mich	---	-	Sep'69	summer complai.
f	0	Mich	---	-	Jul'69	dropsy
f	0	Mich	---	-	Mar'70	birth
m	49	Mich	grocer	m	Nov'69	consumption
f	26	Can	keeping hse	m	Jul'69	confinement
m	0	Mich	---	-	Jul'69	birth
m	0	Mich	---	-	Aug'69	infla. brain
f	15	Can	at home	-	Jan'70	burned
m	12	Can	at school	-	Jan'70	explosion
f	8	Can	at home	-	Jan'70	explosion
f	5	Can	---	-	Jan'70	explosion
f	2	Can	---	-	Jan'70	explosion
f	0	Mich	---	-	Dec'69	birth
F	6	MICH	---	-	JAN'70	SCARLET FEVER
f	0	Mich	---	-	Aug'69	birth
m	1	Mich	---	-	Aug'69	teething
m	22	Ire	labourer	-	Feb'70	brain fever
F	6	MICH	---	-	MAY'70	SCARLET FEVER
F	4	MICH	---	-	MAY'70	SCARLET FEVER
m	0	Mich	---	-	Sep'69	summer complai.
f	0	Mich	---	-	Jan'70	birth
f	52	Can	keeping hse	w	May'70	heart disease
m	35	NY	sailor	-	Nov'69	consumption
m	43	NY	sailor	-	Nov'69	brain disease
m	31	Ire	sailor	-	Dec'69	tuberculosis
m	25	Can	sailor	-	Dec'69	tuberculosis
m	36	Ohio	sailor	-	Jan'70	pneumonia
F	0	MICH	---	-	JUL'69	SCARLET FEVER
m	1	Mich	---	-	Jun'69	summer complai.
f	72	Mich	---	w	Dec'69	dropsy
f	1	Mich	---	-	Feb'70	sore throat
f	112	NC	---	w	Jun'69	old age
f	43	NY	---	m	Jan'70	bronchitis
f	0	Mich	---	-	Jul'69	summer complai.
f	18	Va	---	-	May'70	consumption
m	50	???	labourer	m	Jun'69	consumption
f	6	Eng	---	-	Apr'70	burned
f	0	Can	---	-	Dec'69	fits
M	0	MICH	---	-	AUG'69	SCARLET FEVER
f	0	Mich	---	-	Feb'70	croup
f	39	Can	---	m	Mar'70	brain fever
f	0	Mich	---	-	Nov'69	wh. cough
m	0	Mich	---	-	Feb'70	birth
f	0	Mich	---	-	Aug'69	summer complai.
f	0	Mich	---	-	Jan'70	summer complai.
F	3	MICH	---	-	SEP'69	SCARLET FEVER

Sex	Age	Birth	Occupation	Mar?	Month	Cause
F	1	MICH	---	-	AUG'69	SCARLET FEVER
m	12	Can	---	-	Nov'69	brain fever
F	1	MICH	---	-	JUN'69	SCARLET FEVER
f	7	Mich	---	-	Mar'70	brain fever
m	0	Mich	---	-	May'70	infla. stomach
F	3	MICH	---	-	MAY'70	SCARLET FEVER
m	0	Mich	---	-	Mar'70	brain fever
M	2	MICH	---	-	NOV'69	SCARLET FEVER
F	4	MICH	---	-	NOV'69	SCARLET FEVER
m	7	Mich	---	-	Dec'69	infla. brain
f	0	Mich	---	-	May'70	wh. cough
M	0	MICH	---	-	MAY'70	SCARLET FEVER
f	75	Ire	---	-	Dec'69	old age
f	25	Euro	at home	-	Jun'69	consumption
m	2	Mich	---	-	Nov'69	summer complai.
m	0	Mich	---	-	Jul'69	summer complai.
f	0	Mich	---	-	May'70	???
m	0	Mich	---	-	Jul'69	brain fever
f	0	Mich	---	-	Aug'69	birth
f	0	Mich	---	-	Aug'69	birth
f	1	Mich	---	-	Aug'69	summer complai.
F	1	MICH	---	-	APR'70	SCARLET FEVER
f	0	Wisco	---	-	Jul'69	cancer
f	0	Mich	---	-	Aug'69	fits
f	2	Mich	---	-	Apr'70	wh. cough
m	0	Mich	---	-	Jul'69	summer complai.
F	0	MICH	---	-	JUN'69	SCARLET FEVER
f	0	Mich	---	-	Aug'69	summer complai.
f	1	Mich	---	-	Nov'69	teething
m	36	Mich	labourer	m	Jun'69	consumption
m	0	Mich	---	-	Jul'69	summer complai.
f	0	Mich	---	-	Nov'69	weakness
m	22	Mich	sailor	-	May'70	drowned
m	0	Mich	---	-	Sep'69	birth
f	0	Mich	---	-	Aug'69	fits
m	8	???	---	-	Jun'69	typhoid fever
f	0	Mich	---	-	Jul'69	summer complai.
m	0	Mich	---	-	Jun'69	fits
f	1	Mich	---	-	Oct'69	summer complai.
f	0	Mich	---	-	Dec'69	birth
M	2	MICH	---	-	MAY'70	SCARLET FEVER
F	8	MICH	---	-	MAY'70	SCARLET FEVER
m	35	???	---	m	May'70	unknown
f	0	Mich	---	-	Aug'69	birth
f	0	???	---	-	May'70	fits
f	1	Mich	---	-	Aug'69	summer complai.
m	1	Mich	---	-	Dec'69	summer complai.
f	1	Mich	---	-	Aug'69	summer complai.
m	52	NY	labourer	w	Feb'70	heart disease
f	60	Ky	keeping hse	w	Jun'69	typhoid fever

Sex	Age	Birth	Occupation	Mar?	Month	Cause
f	49	Ohio	keeping hse	m	Feb'70	heart disease
m	40	Ohio	labourer	w	Apr'70	bilious fever
f	0	Mich	---	-	Sep'69	wh. cough
m	0	Mich	---	-	Jun'69	fits
F	5	MICH	---	-	APR'70	SCARLET FEVER
M	3	MICH	---	-	APR'70	SCARLET FEVER
m	65	???	labourer	m	May'70	rupture
f	28	Prus	---	m	May'70	dropsy
m	0	Mich	---	-	Jul'69	summer complai.
m	1	Mich	---	-	Nov'69	fits
m	3	Mich	---	-	Feb'70	typhoid fever
f	42	???	keeping hse	m	Apr'70	child birth
m	8	Mich	---	-	Jun'69	dysentery
f	14	Mich	---	-	Apr'70	dropsy
f	35	Fra	keeping hse	m	Jan'70	confinement
m	7	???	---	-	Jun'69	brain fever
m	0	Mich	---	-	Aug'69	fits
m	2	Mich	---	-	May'70	summer complai.
f	0	Mich	---	-	Aug'69	summer complai.
m	55	???	gardener	m	Mar'70	bilious fever
f	0	Mich	---	-	Jul'69	summer complai.
f	0	Mich	---	-	Mar'70	fits
f	23	Mich	---	-	Aug'69	consumption
f	17	Mich	---	-	Sep'69	consumption
m	1	Mich	---	-	Oct'69	teething
m	1	Mich	---	-	Sep'69	summer complai.
m	0	Mich	---	-	Aug'69	infla. brain

APPENDIX D

1871 MANUSCRIPT CENSUS--microfilm #9943, 9944, 9945
Province of Ontario, District no. 32 Waterloo,
Nominal Return of Deaths, June 1, 1870-May 31, 1871

* Scarlet fever deaths are highlighted by bold, upper-case print.

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
				Sub-District A--Wellesley, township			
m	0	Meth	Ont	---	-	Feb'71	croup
f	74	CofE	Eng	---	w	Jan'71	old age
f	17	Cath	Ont	---	-	Sep'70	decline
f	34	CofE	Ire	---	m	Sep'70	stroke
f	1	Luth	Ger	---	-	May'71	diarrhoea
m	12	Cath	Ont	---	-	Jul'70	rheuma.fever
f	0	Meth	Ont	---	-	Jan'71	appolep.fits
m	0	Pres	Ont	---	-	Mar'71	unknown
m	82	Pres	Scot	farmer	w	Apr'71	old age
m	11	CofE	Ont	---	-	Feb'71	infla. bowel
m	30	Meth	Eng	---	-	Jun'70	decline
m	52	Meth	Ont	farmer	m	Nov'70	infla. bowel
f	64	Meth	Ire	farmer	m	Sep'70	abcess
m	34	Prees	Ire	farmer	w	Apr'71	infla. kidney
M	**75**	**PRES**	**IRE**	**FARMER**	-	**FEB'71**	**SCARLET FEVER**
f	5	Meth	Ont	---	-	May'71	diptheria
f	0	Cath	Ont	---	-	Jun'70	wh. cough
f	19	Pres	Ont	---	-	Jan'71	---
f	0	Pres	Ont	---	-	Jul'70	diarrhoea
m	48	Evan	Ger	farmer	m	Dec'70	dropsy
f	0	Pres	Ont	---	-	Jul'70	diarrhoea
m	2	Meno	Ont	---	-	Apr'71	infla. lungs
f	1	Meno	Ont	---	-	Mar'71	infla. lungs
m	79	Pres	Scot	farmer	m	Jun'70	old age
f	0	Bapt	Ont	---	-	Jul'70	diarrhoea
m	20	Pres	Ont	---	-	Jul'70	dropsy
m	90	Pres	Scot	---	w	Feb'71	old age
m	32	---	Ont	farmer	m	Sep'70	erysipelas
f	22	Pres	Ont	---	-	Mar'71	apoplexy
m	0	---	Ont	---	-	Feb'71	dis. of lungs
f	62	---	Scot	---	-	Dec'70	fits
f	4	Meno	Ont	---	-	Jul'70	accident
f	0	Meno	Ont	---	-	Nov'70	croup
f	74	Epis	Eng	---	m	Apr'71	old age
m	59	Cath	Fra	farmer	m	Oct'70	suicide
f	52	Meth	Ont	---	m	Apr'71	?
m	63	Luth	Ger	farmer	m	Nov'70	heart dis.
f	38	Luth	Ger	---	m	Jun'70	consumption
m	1	Luth	Ont	---	-	Nov'70	croup
f	0	Cath	Ont	---	-	Jan'71	lung dis.

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	0	Luth	Ont	---	-	Aug'70	---
f	50	Luth	Ger	---	w	Jul'70	---
m	0	Luth	Ont	---	-	Jul'70	---
m	2	Luth	Ont	---	-	Jun'70	lung dis.
f	24	Pres	Ont	---	m	Feb'71	consumption
f	0	Cath	Ont	----	-	Feb'71	---
m	3	Luth	Ont	---	-	Jan'71	heart dis.
f	0	Cath	Ont	---	-	Apr'71	---
f	93	Cath	Ger	---	w	Apr'71	dropsy
m	1	Meno	Ont	---	-	Feb'71	lung dis.
f	0	Cath	Ont	---	-	Nov'70	cramps

Sub-District B--Woolwich, township

f	17	Cath	Ont	---	-	Mar'71	typhoid fever
m	0	Cath	Ont	---	-	Sep'70	teething
m	45	Cath	Ger	farmer	m	Feb'71	?
f	6	Luth	Ont	---	-	Feb'71	?
m	23	Cath	U.S.	Butcher	-	Dec'70	typhoid fever
m	2	Luth	Ont	---	-	Oct'70	typhoid fever
f	19	Luth	Ont	---	-	Nov'70	typhoid fever
f	17	Luth	Ont	---	-	Nov'70	typhoid fever
f	24	Breth	Ont	---	m	Jul'70	consumption
m	29	Meno	Ont	farmer	m	Jan'71	typhoid fever
f	66	Bapt	Eng	---	m	Oct'70	heart dis.
m	4	Bapt	Ont	---	-	Jul'70	unknown
f	0	Meno	Ont	---	-	Mar'71	infla. lungs
m	3	---	Ont	---	-	Sep'70	unknown
m	0	---	Ont	---	-	Oct'70	unknown
f	68	Cath	Ger	---	m	Nov'70	cancer
m	75	Luth	Ger	---	w	Dec'70	rheumatism
m	0	---	Ont	---	-	Oct'70	infla. brain
m	0	---	Ont	---	-	Jan'71	scalded
f	0	Luth	Ont	---	-	Dec'70	fits
f	24	Luth	Ger	---	m	Oct'70	typhoid fever
f	43	Luth	Ger	---	m	Aug'70	consumption
f	71	Pres	Ire	---	w	Dec'70	decline
m	0	---	Ont	---	-	Mar'71	convulsions
m	72	Meno	U.S.	ret'd farm.	m	Oct'70	typhoid fever
f	5	---	Ont	---	-	Sep'70	convulsions
m	14	---	Ont	---	-	Dec'70	typhoid fever
m	56	Pres	Ire	farmer	m	Feb'71	asthma
f	44	Luth	Ger	---	m	Nov'70	drowning
m	16	Cath	Ont	labourer	?	Sep'70	typhoid fever
m	2	---	Ont	---	-	Aug'70	typhoid fever
f	33	Meno	Ont	---	m	Oct'70	typhoid fever
m	26	---	Ont	labourer	m	Jan'71	consumption
f	33	Luth	Ger	---	m	Aug'70	lock jaw
f	0	---	Ger	---	-	Aug'70	teething
m	79	Meno	U.S.	ret'd farm.	w	Sep'70	dropsy

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	67	Luth	Ger	---	w	Apr'71	consumption
f	88	Pres	Scot	---	w	Nov'70	constipation
m	16	Luth	Ont	servant	-	Sep'70	fever
f	20	Luth	Ger	servant	-	Aug'70	typhoid fever
f	78	---	U.S.	---	w	Jan'71	apoplexy
f	33	Meth	Ont	---	-	May'71	consumption
f	63	Evan	Ger	---	w	Nov'70	dropsy
f	11	---	Ont	---	-	Dec'70	typhoid fever
f	9	---	Ont	---	-	Nov'70	typhoid fever
m	7	---	Ont	---	-	Nov'70	typhoid fever
F	3	---	ONT	---	-	FEB'71	SCARLET FEVER
f	0	---	Ont	---	-	Feb'71	teething
f	18	Luth	Ont	---	-	Oct'70	typhoid fever
f	17	Luth	Ont	---	-	Dec'70	rheumat.fever
f	0	Luth	Ont	---	-	Mar'71	typhoid fever
m	19	Luth	Ont	---	-	Jul'70	typhoid fever
m	26	Meno	Ont	farmer	m	Jun'70	lock jaw
f	22	Meno	Ont	---	-	Aug'70	dis. of heart
f	0	Meno	Ont	---	-	May'71	fits
f	0	Luth	Ont	---	-	Aug'70	unknown
m	0	Luth	Ont	---	-	Jun'70	unknown
m	32	Meno	Ont	farmer	m	Nov'70	typhoid fever
m	62	Luth	Ger	farmer	m	Sep'70	epileptic fit
m	52	Luth	Ger	farmer	m	Feb'71	infla. lungs
m	68	Luth	Ger	---	m	Sep'70	old age
M	4	COFE	ONT	---	-	MAR'71	SCARLET FEVER
f	4	Meno	Ont	---	-	Dec'70	croup
f	43	Luth	Ger	---	m	Feb'71	infla. lungs

Sub-District C--Waterloo North, township

f	60	Meno	Ont	---	m	May'71	---
m	0	Meth	Ont	---	-	Nov'70	---
m	22	Meno	Ont	labourer	-	Jul'70	consumption
f	3	Bapt	Ont	---	-	Oct'70	scalded
f	0	---	Ont	---	-	Aug'70	---
f	42	Cath	Ger	---	m	Sep'70	---
m	71	Luth	Ger	locksmith	m	Mar'71	dropsy
m	0	Luth	Ger	---	-	Oct'70	---
f	73	Meno	U.S.	---	m	Dec'70	old age
f	0	---	Ont	---	-	Feb'71	---
f	1	Cath	Ont	---	-	Aug'70	---
m	1	Cath	Ont	---	-	Nov'70	consumption
f	80	Cath	Ger	---	m	Jul'70	rheumatism
m	0	Cath	Ont	---	-	Jan'71	---
m	79	Menn	U.S.	farmer	w	Sep'70	dropsy
m	0	Cath	Ont	---	-	Aug'70	---
f	28	Breth	Ont	---	m	Nov'70	palsey
f	0	---	Ont	---	-	Jul'70	diarrhoea
m	57	Meno	U.S.	farmer	m	Nov'70	consumption

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
m	3	Cath	Ont	---	-	Jul'70	fits
m	0	Cath	Ont	---	-	Jan'71	fits
f	17	Luth	Ont	---	-	Dec'70	typhoid fever
f	2	Cath	Ger	---	-	Jun'70	infermation
f	19	Meno	Ont	---	m	Oct'70	puerper.fever
m	9	Luth	Ont	---	-	Nov'70	dropsy
m	47	Cath	Ger	labourer	-	Dec'70	consumption
m	85	Luth	Ger	mechanic	w	Mar'71	dropsy
f	0	---	Ont	---	-	Apr'70	spasm

Sub-District D--Berlin, town

m	70	Luth	Ger	poor hse	m	Apr'71	asthma
m	59	Luth	Ger	poor hse	-	Apr'71	dyspepsia
m	0	---	Ont	poor hse	m	Jul'70	fits
f	28	CofE	Ire	poor hse	-	Nov'70	consumption
m	64	Luth	Ger	poor hse	-	Nov'70	exhaustion
m	77	Cath	Ger	poor hse	m	Dec'70	dyspepsia
m	55	---	Ont	poor hse	-	Jul'70	consumption
m	63	Luth	Ger	poor hse	w	Feb'71	accident
f	1	---	Ont	---	-	Aug'70	infla. bowel
f	14	Cath	Ont	---	-	Sep'70	fever
m	8	Luth	Ont	---	-	Sep'70	consumption
M	2	---	ONT	---	-	JUL'70	SCARLET FEVER
f	44	Luth	Ger	---	m	Jan'71	lung disease
f	0	---	Ont	---	-	Oct'70	---
f	1	---	Ont	---	-	Mar'71	cramps
m	8	---	Ont	---	-	Sep'70	infla. bowel
m	66	Cath	Fra	---	w	Jun'70	consumption
m	1	---	Ont	---	-	Oct'70	unknown
m	32	Jerus	Ont	physician	m	Nov'70	consumption
m	22	---	Ont	---	-	Feb'71	consumption
f	1	---	Eng	---	-	Jun'70	measles
m	36	---	Ger	tobaccoist	m	Mar'71	consumption
m	0	---	Ont	---	-	Aug'70	dysentery
m	0	---	Ont	---	-	Apr'71	dysentery
m	0	---	Ont	---	-	Jun'70	infla. lungs
f	66	Plymo	Eng	---	m	Feb'71	burst bl.ves
f	45	---	Ger	---	m	May'71	child bed
m	12	---	Ont	---	-	May'71	---
f	0	---	Ont	---	-	Oct'70	cramps
f	11	Luth	Ont	---	-	Mar'71	cramps
f	38	Mino	Ont	---	m	Oct'70	typhoid fever
f	0	Luth	Ont	---	-	May'71	measles
m	3	Luth	Ont	---	-	May'71	measles
m	0	---	Ont	---	-	May'71	infla. lungs
f	3	---	Ont	---	-	Apr'71	measles
m	0	---	Ont	---	-	Dec'70	cramps
m	43	Luth	Ger	tailor	m	Aug'70	---
f	23	Luth	Ger	---	m	Jul'70	child bed

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
m	0	---	Ont	---	m	Aug'70	cramps
f	18	Luth	U.S.	---	m	Mar'71	child bed
f	69	Luth	Ger	---	w	Oct'70	dropsy
f	1	---	Ont	---	-	Oct'70	cramps
m	46	Luth	Ger	labourer	m	Sep'70	tumor
f	0	---	Ont	---	-	Sep'70	cramps
f	0	---	Ont	---	-	Aug'70	cramps
m	0	---	Ont	---	-	Jan'71	cramps
				Sub-District E--Waterloo, village			
f	3	Luth	Ont	---	-	Apr'71	fits
f	0	Luth	Ont	---	-	Apr'71	fits
f	0	Luth	Ont	---	-	Sep'70	fits
m	0	Luth	Ont	---	-	Aug'70	teething
m	0	Luth	Ont	---	-	Mar'71	fever
m	1	Pres	Ont	---	-	Jul'70	teething
f	61	Luth	Ger	---	w	Jan'71	consumption
m	2	Luth	Ger	---	-	May'71	infla. brain
m	1	Luth	Ont	---	-	Nov'70	teething
f	0	Luth	U.S.	---	-	Jun'70	---
m	0	Luth	Ont	---	-	Sep'70	teething
f	3	Luth	Ont	---	-	Jun'70	infla. throat
f	1	---	Ont	---	-	Aug'70	croup
m	1	Luth	Ont	---	-	Feb'71	fever
m	35	Meth	Ont	bookkeeper	m	Oct'70	consumption
f	0	CofE	Ont	---	-	Aug'70	diarrhoea
m	2	Pres	Ont	---	-	Jun'70	unknown

APPENDIX E

1871 MANUSCRIPT CENSUS--microfilm #9933, 9934, 9935, 9936
Province of Ontario, District no. 27 Bruce (South),
Nominal Return of Deaths, June 1, 1870-May 31, 1871

* Scarlet fever deaths are highlighted by bold, upper-case print.

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
Sub-District A--Huron, township							
m	49	Pres.	Scot	pensionner	m	Nov'70	heart dis.
f	60	CofE	Eng	tavern keep	w	Oct'70	conges. brain
f	11	CofE	Can	---	-	Apr'71	bilious fever
m	7	Pres.	Can	---	-	Jul'70	accident
m	25	Pres	Scot	farmer	-	Mar'71	consumption
m	0	CofE	Can	---	-	Feb'71	unknown
m	25	Pres	Can	---	-	Apr'71	pleurisy
f	3	Meth	U.C.	---	-	Jul'70	infla. bowels
m	6	CofE	U.C.	---	-	Oct'70	dyssentery
m	84	Pres	Ire	farmer	m	Mar'71	old age
m	24	Pres	U.C.	fisherman	-	Nov'70	drowned
f	7	---	Ont	---	-	Dec'70	???
f	5	---	Ont	---	-	Jul'70	infla.
m	0	---	Ont	---	-	Apr'71	???
m	0	---	Ont	---	-	Jul'70	unknown
m	0	---	Ont	---	-	Apr'71	unknown
m	80	Pres	Scot	farmer	w	Mar'71	old age
f	0	---	Ont	---	-	Oct'70	whoop.cough
m	58	Pres	Scot	farmer	w	Nov'70	unknown
f	18	CofE	Scot	---	-	Apr'71	consumption
f	1	CofE	Ont	---	-	Apr'71	H2O Brain
m	0	CofE	Ont	---	-	Sep'70	unknown
m	2	CofE	Ont	---	-	Jan'71	erysipelas
f	80	CofE	Scot	---	w	May'71	old age
m	0	CofE	Ont	---	-	Jan'71	unknown
f	0	CofE	Ont	---	-	Apr'71	unknown
m	70	CofE	Scot	---	w	Dec'70	unknown
f	65	CofE	Scot	---	m	Mar'71	consumption
m	1	CofE	Ont	---	-	Mar'71	unknown
m	2	Meth	Ont	---	-	Aug'70	dis. of heart
m	10	CofE	Eng	---	-	Jan'71	brain fever
f	78	Meth	Ire	---	w	Oct'70	old age
f	2	Cath	Ont	---	-	Feb'71	croup
f	33	Pres	Scot	---	m	Dec'71	infla. bowels
m	18	Pres	Ont	farm labour	-	May'71	consumption
Sub-District B--Kinloss, township							
m	63	CofE	Eng	factory	m	Nov'70	consumption
f	72	CofE	Ire	farmer	m	Jan'71	dropsy

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	7	CofE	Ont	---	-	Dec'70	rheumatism
f	70	Meth	Ire	farmer	m	Sep'70	dropsy
m	85	Cath	Ire	farmer	w	Jan'71	dropsy
m	0	Pres	Scot	---	-	Apr'71	cold
m	0	Pres	Scot	---	-	Apr'71	cold
f	40	Pres	Scot	---	m	Mar'71	consumption
m	25	Pres	Scot	farm labour	-	Apr'71	consumption
m	44	Pres	Scot	farmer	-	Jan'71	---
m	2	Pres	Ont	---	-	Feb'71	---
f	1	Pres	Ont	---	-	Aug'70	---
f	45	Pres	Scot	---	-	Jun'70	infla.
f	70	Pres	Scot	---	w	Jan'71	---
m	5	Pres	Ont	---	-	Dec'70	measles

Sub-District C--Culross, township

m	57	Cath	Scot	farmer	m	Mar'71	unknown
f	20	Cath	Scot	---	-	Jan'71	dropsy
f	33	Meth	Ont	---	m	Jan'71	consumption
f	0	Pres	Ont	---	-	Oct'70	infla. lungs
m	2	Pres	Ont	---	-	Nov'70	croup
f	0	Pres	Ont	---	-	Feb'71	---
m	0	---	Ont	---	-	Mar'71	---
m	60	Cath	Ire	farmer	m	Mar'71	---
m	43	CofE	Ire	farmer	m	Nov'70	liver complai
f	24	Pres	Scot	---	-	Oct'70	cancer
m	0	Pres	Ont	---	-	Aug'70	---
f	45	Cath	Scot	---	w	Apr'71	consumption
m	2	Pres	Ont	---	-	Nov'70	croup
f	0	Pres	Ont	---	-	Jul'70	erysipelas
f	22	Pres	Ont	---	m	Apr'71	infla.
f	0	Pres	Ont	---	-	Aug'70	cholera
f	3	Pres	Ont	---	-	Dec'70	burned
f	0	Meth	Ont	---	-	Dec'70	erysipelas
f	17	Meth	Ont	---	-	Jul'70	fever
f	0	Cath	Ont	---	-	May'71	whoop.cough
m	0	Cath	Ont	---	-	Aug'70	infla.
f	38	Pres	Ire	---	m	Dec'70	infla.
f	2	Pres	Can	---	-	Mar'71	croup
m	22	Pres	Scot	sch.teacher	-	Feb'71	stone in ?
m	0	Cath	Can	---	-	Aug'70	fits
m	0	Cath	Can	---	-	Feb'71	fits
m	1	Cath	Can	---	-	Aug'70	croup
f	0	Cath	Can	---	-	Feb'71	fits
m	68	Pres	Scot	printer	w	Jun'70	cut
m	32	Meth	Can	shoemaker	m	Apr'71	cancer

Sub-District D--Carrick, township

f	2	Cath	Ont	---	-	Jan'71	teething

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	0	Cath	Ont	---	-	Sep'70	teething
m	0	Cath	Ont	---	-	Aug'70	teething
m	1	Luth	Ont	---	-	Sep'70	teething
m	5	Luth	Ont	---	-	Oct'70	dis. of heart
f	40	Luth	Germ	---	m	Aug'70	confinement
m	2	???	Ont	---	-	Feb'71	teething
f	0	Luth	Ont	---	-	Jul'70	unknown
f	0	Luth	Ont	---	-	Jul'70	unknown
m	0	Cath	Ont	---	-	Oct'70	fits
m	60	Cath	Ire	labourer	m	Jun'70	---
m	2	Cath	Ont	---	-	Oct'70	---
f	4	Cath	Ont	---	-	Mar'71	typhoid
f	2	Cath	Ont	---	-	Jun'70	fits
f	26	Pres	Ont	---	m	Sep'70	dropsy
f	0	Pres	Ont	---	-	Oct'70	fever
f	8	Pres	Ont	---	-	Nov'70	fever
f	7	Cath	Ont	---	-	Apr'71	fire
m	18	Cath	Ont	---	-	Apr'71	fire
f	1	Cath	Ont	---	-	Sep'70	---
f	21	Meth	Ont	---	m	Feb'71	confinement
m	0	Cath	Ont	---	-	Mar'71	???
m	0	CofE	Ont	---	-	Sep'70	bilious fever

Sub-District E--Kincardine, township

f	1	Pres	Ont	---	-	Dec'70	infla. brain
m	3	Pres	Ont	---	-	Dec'70	epixlaxis
m	0	Meth	Ont	---	-	Aug'70	whoop.cough
m	1	Meth	Ont	---	-	Sep'70	whoop.cough
f	58	CofE	Ire	---	w	Mar'71	liver complai
m	0	Pres	Ont	---	-	Jul'70	infla. bowels
f	34	CofE	Eng	---	m	Aug'70	consumption
f	21	Meth	Ont	---	-	Dec'70	typhoid fever
m	51	Meth	Ont	???	m	Dec'70	typhoid fever
m	0	???	Ont	---	-	Mar'71	bronchitis
m	92	Pres	Scot	farmer	m	Jul'70	old age
f	77	Pres	Scot	---	m	Oct'70	rheumatism
m	80	CofE	Ire	farmer	-	May'71	gravell
m	50	Pres	Scot	farmer	m	Jun'70	dropsy
f	2	Pres	Ont	---	-	Apr'71	scalded
f	66	Pres	Scot	---	w	Feb'71	heart dis.
m	38	Pres	N.S.	farmer	-	Sep'70	inter. fever
m	0	Pres	Ont	---	-	Jan'71	unknown
f	76	???	Scot	---	m	Aug'70	???
m	0	???	Ont	---	-	Jan'71	infla. lungs
m	25	???	Ont	sch.teacher	m	Mar'71	consumption
f	0	---	Ont	---	-	May'71	---
f	0	---	Ont	---	-	Nov'70	---
m	0	---	Ont	---	-	Apr'71	---
f	63	Meth	Ont	---	m	Sep'70	cancer

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	1	---	Ont	---	-	Jun'70	mort. of foot
f	0	---	Ont	---	-	Jan'71	burn
f	0	---	Ont	---	-	Feb'71	still born
f	57	Pres	Ont	---	m	Sep'70	consumption
			Sub-District F--Kincardine, village				
f	71	Pres	Ire	---	m	Jan'71	nat. causes
f	1	Bap	Ont	---	-	Aug'70	whoop.cough
M	1	PRES	ONT	---	-	AUG'70	SCARLET FEVER
m	0	Pres	Ont	---	-	Aug'70	nat. causes
f	60	Meth	Ont	---	m	Nov'70	paralysis
f	0	Pres	Ont	---	-	Feb'71	erysipelas
m	0	CofE	Ont	---	-	Dec'70	---
f	10	Meth	0	---	-	Apr'71	infla. lungs
f	83	Pres	Scot	---	w	Mar'71	nat. causes
m	10	Pres	Ont	---	-	Jul'70	dis. of brain
f	7	Pres	Ont	---	-	Aug'70	whoop.cough
f	0	Pres	Ont	---	-	Aug'70	bronchitis
m	23	Pres	Ont	car'ge mkr	-	Oct'70	consumption
m	6	Pres	Ont	---	-	Jun'70	whoop.cough
m	0	Pres	Ont	---	-	Mar'71	infla.
m	4	Pres	Ont	---	-	Aug'70	whoop.cough
f	0	Pres	Ont	---	-	Oct'70	---
f	0	Epis	Ont	---	-	Nov'70	---
f	0	Meth	Ont	---	-	Aug'70	ulcer.bowel
m	0	Pres	Ont	---	-	Jul'70	convulsions
f	0	Pres	Ont	---	-	Oct'70	???
m	0	CofE	Ont	---	-	Dec'70	bronchitis
f	0	CofE	Ont	---	-	Jul'70	convulsions
f	50	CofE	Ont	---	m	Feb'71	bronchitis
f	1	CofE	Ont	---	-	Oct'70	diarrhoea
m	17	Pres	Ont	---	-	Jan'71	scrofula
m	0	Meth	Ont	---	-	Aug'70	convulsions
m	71	Meth	Eng	painter	m	Aug'70	rupture
f	71	Meth	Eng	---	m	Apr'71	asthma
f	29	Pres	N.S.	---	m	Sep'70	child birth
f	0	Pres	Ont	---	-	Oct'70	conges. brain
m	1	Meth	Ont	---	-	Jun'70	conges. brain
f	0	Pres	Ont	---	-	Jun'70	consumption
m	0	Pres	Ont	---	-	Apr'71	convulsions
			Sub-District G--Greenock, township				
f	1	Cath	Ont	---	-	Nov'70	dis. lungs
f	?	Pres	PEI	---	m	Feb'71	debility
m	67	Pres	Scot	shoemaker	m	Mar'71	ulcer.stomach
m	0	Pres	Ont	---	-	Apr'71	unknown
f	0	Pres	Ont	---	-	Dec'70	peritonitus
m	55	Pres	Scot	labourer	m	May'71	infla. lungs

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	60	Pres	Scot	---	m	Sep'70	unknown
f	53	Pres	Scot	---	m	Sep'70	consumption
f	0	Pres	Ont	---	-	Feb'71	infla. lungs
				Sub-District H--Brant, township			
m	69	Epis	Ire	farmer	m	Oct'70	decline
f	78	Pres	Scot	---	m	Feb'71	heart dis.
m	0	Meth	Ont	---	-	Jul'70	lung dis.
m	40	Meth	Eng	farmer	-	Apr'71	decline
f	0	Meth	Ont	---	-	Nov'70	unknown
f	13	Pres	Ont	---	-	Jan'71	asthma
f	0	Bapt	Ont	---	-	Jun'70	infla. lungs
f	2	Bapt	Ont	---	-	May'71	measles
f	37	Pres	Scot	---	m	Jun'70	???
f	3	Meth	Ont	---	-	Jun'70	conges. brain
m	0	Epis	Ont	---	-	---	unknown
f	32	Pres	Scot	---	m	Nar'71	confinement
f	2	Pres	Scot	---	-	Mar'71	conges.brain
f	44	Meth	Ont	---	m	Dec'70	unknown
f	58	Epis	Ire	---	m	Mar'71	conges.lungs
f	3	Meth	Ont	---	-	Jul'70	unknown
f	54	CofE	Eng	---	m	Oct'70	infla. bowel
f	40	Cath	Germ	---	m	Mar'71	consumption
m	0	???	Ont	---	-	Jan'71	unknown
m	79	CofE	Ire	farmer	m	Feb'71	liver complai
m	66	Cath	Ire	farmer	m	Jun'70	accident
f	0	???	Ont	---	-	Jun'70	diarrhoea
f	0	Pres	Ont	---	-	Oct'70	???
f	42	Meth	Eng	---	m	Mar'71	consumption
f	3	CofE	Ont	---	-	Jul'70	infla. lungs
m	27	Pres	Ont	farmer	-	Mar'71	consumption
m	0	Cath	Ont	---	-	Sep'70	unknown
f	0	Luth	Ont	---	-	Aug'70	???
m	8	Luth	Ont	---	-	Sep'70	quinsy
f	3	Pres	Ont	---	-	Oct'70	croup
f	12	Pres	Ont	---	-	Aug'70	rheumatism
f	3	Meth	Ont	---	-	Mar'71	erysipelas
m	47	Meth	Eng	farmer	m	Feb'71	heart dis.
m	0	Pres	Ont	---	-	Mar'71	infla.
f	8	Menn	Ont	---	-	Dec'70	lung dis.
m	0	Cath	Ont	---	-	May'71	whoop.cough
m	0	Cath	Ont	---	-	May'71	whoop.cough
m	86	Meth	Eng	shoemaker	w	Apr'71	old age
m	3	Meth	Ont	---	-	Feb'71	infla. bowel
f	0	Meth	Ont	---	-	Sep'70	unknown

APPENDIX F

1871 MANUSCRIPT CENSUS--microfilm #9962, 9963, 9964
Province of Ontario, District no. 42 Simcoe (North),
Nominal Return of Deaths, June 1, 1870-May 31, 1871

* Scarlet fever deaths are highlighted by bold, upper-case print.

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
				Sub-District A--Nottawasaga, township			
f	4	CofE	Ont	---	-	Jan'71	typhoid fever
m	69	Meth	Ont	farmer	m	Oct'70	brain fever
m	0	Meth	Ont	---	-	Mar'71	bronchitis
f	0	Meth	Ont	---	-	Mar'71	---
m	2	Pres	Ont	---	-	Sep'70	croup
f	0	Pres	Ont	---	-	Aug'70	croup
m	0	Pres	Ont	---	-	May'71	croup
f	3	CofE	Ont	---	-	Jul'70	---
m	92	CofE	Ire	---	w	Jul'70	---
f	1	Meth	Ont	---	-	Jul'70	---
m	0	Meth	Ont	---	-	Nov'70	---
m	0	CofE	Ont	---	-	Jul'70	infla. bowels
f	18	Pres	Ont	sch.mistres	-	Nov'70	heart dis.
m	60	Pres	Scot	farmer	m	Jan'71	---
f	1	Pres	Ont	---	-	Aug'70	---
m	2	Pres	Ont	---	-	Jun'70	convulsions
m	0	Pres	Ont	---	-	May'71	---
m	60	Pres	Ont	farmer	m	Jul'70	dis. bowels
f	1	CofE	Ont	---	-	Dec'70	croup
f	24	Pres	Ont	---	m	Aug'70	consumption
m	53	Pres	Scot	farmer	m	Mar'71	consumption
m	60	Pres	Scot	carpenter	-	Mar'71	---
f	5	Pres	Ont	---	-	Jun'70	---
m	80	Pres	Scot	farmer	m	Dec'70	old age
m	38	Pres	Scot	farmer	-	Apr'71	accident
m	82	Pres	Scot	farmer	w	Aug'70	---
f	0	CofE	Ont	---	-	May'71	infla. lungs
m	90	CofE	Scot	farmer	w	Feb'71	old age
m	0	---	Ont	---	-	Jan'71	---
m	16	CofE	Ont	---	-	Feb'71	heart dis.
f	0	Pres	Ont	---	-	Dec'70	---
m	58	Pres	Scot	farmer	m	Jul'70	---
f	29	Meth	Ont	---	m	Aug'70	---
f	0	Meth	Ont	---	-	Aug'70	---
f	60	Pres	Scot	---	w	Jan'71	---
f	3	Meth	Eng	---	-	Jun'70	---
m	50	Pres	Scot	blacksmith	m	Dec'70	---
m	70	???	Germ	farmer	m	Jul'70	---
f	0	???	Ont	---	-	Jul'70	---
m	0	Disc	Ont	---	-	Oct'70	---

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	64	Disc	Scot	---	m	Dec'70	---
m	23	Pres	Ont	labourer	-	Jun'70	drowned
f	35	Pres	Eng	---	m	May'71	---
m	43	Pres	Scot	labourer	m	Apr'71	---
f	1	Pres	Ont	---	-	Sep'70	drowned
m	2	Pres	Ont	---	-	Aug'70	dyssentery
F	10	COFE	ONT	---	-	MAY'71	SCARLET FEVER
M	4	COFE	ONT	---	-	JUL'70	SCARLET FEVER
m	2	Meth	Ont	---	-	Feb'71	burned
f	29	Pres	Scot	---	m	Oct'70	---
m	34	Pres	Ire	storekeeper	m	Jan'71	rheumatism
m	0	Pres	Ont	---	-	Nov'70	infla.
f	1	Meth	Ont	---	-	Sep'70	---
f	0	Cath	Ont	---	-	Dec'70	birth
f	71	CofE	Ire	---	w	Sep'70	---
f	0	Pres	Ont	---	-	Jun'70	birth
f	26	Meth	Ont	dressmaker	m	Jul'70	typhoid fever
f	0	CofE	Ont	---	-	May'71	cancer
f	5	Meth	Ont	---	-	Aug'70	cancer
f	0	Meth	Ont	---	-	Mar'71	---
m	36	CofE	Eng	labourer	m	Jun'70	---
f	0	Pres	Ont	---	-	Aug'70	---
m	28	Meth	Ont	labourer	m	Sep'70	---
m	1	Meth	Ont	---	-	Oct'70	H2O brain
m	0	Pres	Ont	---	-	Aug'70	H2O brain
m	67	Meth	Eng	bookkeeper	m	Jan'71	parlatick
f	56	Meth	Ire	---	m	Mar'71	consumption
m	5	Pres	Ont	---	-	Apr'71	drowned
m	51	Meth	Ont	farmer	m	Mar'71	consumption
f	3	Pres	Ont	---	-	Par'71	---
m	0	Pres	Ont	---	Jun'70		birth
f	1	CofE	Ont	---	-	Apr'71	---
m	0	Pres	Ont	---	-	Mar'71	---
f	5	CofE	Ont	---	-	Mar'71	---
m	9	CofE	Ont	---	-	Mar'71	---
m	30	CofE	Ont	farmer	m	Jan'71	diphtheria
f	11	CofE	Ont	---	-	Jan'71	diphtheria
m	2	CofE	Ont	---	-	Jan'71	diphtheria
m	1	CofE	Ont	---	-	Jan'71	diphtheria

Sub-District B--Collingwood, township

m	54	Cath	Ire	engineer	m	Jan'71	fall
m	5	Cath	Nfld	---	-	May'71	brain fever
f	0	CofE	Ont	---	-	Jul'70	---
m	0	Pres	Ont	---	-	Dec'70	---
m	0	Pres	Ont	---	-	Jan'71	---
f	3	CofE	Ont	---	-	Feb'71	croup
m	1	CofE	Ont	---	-	Feb'71	croup
f	43	CofE	Eng	---	m	Sep'70	infla. liver

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	29	Pres	Scot	---	m	Jun'70	peurp.fever
f	0	Pres	Ont	---	-	Jan'71	debility
m	0	Pres	Ont	---	-	Dec'70	liver complai
f	3	Pres	Ont	---	-	Mar'71	accident
m	0	Pres	Ont	---	-	Jul'70	teething
f	1	Meth	Ont	---	-	Dec'70	malnutrition
m	1	Cath	Ont	---	-	Aug'70	teething
f	1	CofE	Ont	---	-	Dec'70	croup
f	0	Cath	Ont	---	-	Oct'70	croup
m	0	Cath	Ont	---	-	Sep'70	croup
m	0	Meth	Ont	---	-	Jan'71	convulsions
m	0	CofE	Ont	---	-	May'71	teething
F	5	PRES	ONT	---	-	NOV'70	SCARLET FEVER
F	24	PRES	ONT	---	M	JAN'71	SCARELT FEVER
M	1	PRES	ONT	---	-	JAN'71	SCARLET FEVER
f	0	Pres	Ont	---	-	Jul'70	measles
f	2	Meth	Ont	---	-	Jun'70	measles
m	3	Pres	Ont	---	-	Jul'70	diphtheria
f	1	Meth	0	---	-	Nov'70	convulsions
m	1	Meth	Ont	---	-	Jun'70	teething
m	0	Meth	Ont	---	-	Jul'70	measles
m	0	Pres	Ont	---	-	Jun'70	measles
f	0	Meth	Ont	---	-	Apr'71	conges. lungs
m	0	Meth	Ont	---	-	Apr'71	conges. lungs
f	0	CofE	Ont	---	-	Jan'71	birth
m	18	CofE	Eng	moulder	-	Jul'70	consumption
				Sub-District C--Sunnidale, township			
f	0	---	Ont	---	-	Nov'70	heart
m	0	---	Ont	---	-	Jul'70	infla. brain
m	57	Cath	Ire	farmer	-	Oct'70	asthma
F	7	METH	ONT	---	-	FEB'71	SCARLET FEVER
f	0	---	Ont	---	-	Aug'70	still born
m	0	Cath	Ont	---	-	Jul'70	diarrhoea
m	0	Cath	Ont	---	-	Jul'70	diarrhoea
m	35	Pres	Ont	---	m	Dec'70	consumption
f	7	CofE	Ont	---	-	Jun'70	worms
m	80	Bapt	U.S.	farmer	m	Apr'71	old age
m	18	Cath	Ire	---	-	Mar'71	consumption
m	10	Meth	Ont	---	-	Mar'71	fever
m	1	---	Ont	---	-	Jun'70	epil. fits
f	24	CofE	Ont	---	m	Jul'70	child bed
m	0	---	Ont	---	-	Jun'70	---
m	1	Cath	Ont	---	-	Jun'70	---
m	1	Cath	Ont	---	-	Jun'70	---
f	2	CofE	Eng	---	-	Nov'70	infla. bowels
m	0	Meth	Ont	---	-	Feb'71	consumption
m	7	Prot	Ont	---	-	Apr'71	drowning
m	43	Cath	Ire	farmer	m	Dec'70	asthma

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
m	24	Cath	Que	labourer	m	Nov'70	---
m	1	Cath	Ont	---	-	Oct'70	teething
m	0	Cath	Ont	---	-	Feb'71	cold
f	1	Meth	Ont	---	-	Oct'70	dropsy
m	0	Cath	Ont	---	-	Apr'71	cold
f	0	Meth	Ont	---	-	Nov'70	---
m	0	CofE	Ont	---	-	Aug'70	H2O brain
f	0	Cath	Ont	---	-	Jul'70	fever
				Sub-District D--Vespra, township			
f	1	Cath	Ont	---	-	Jul'70	diarrhoea
m	58	Cath	Ire	labourer	m	Feb'71	accident
f	4	Cong	Ont	---	-	Mar'71	fever
m	0	Meth	Ont	---	-	Feb'71	infla. chest
f	78	CofE	Ire	---	w	Oct'70	old age
m	49	Meth	U.S.	farmer	w	Jun'70	dis. lungs
f	64	CofE	Ire	---	m	Apr'71	unknown
m	0	Cath	Ont	---	-	Apr'71	---
m	1	Cath	Ont	---	-	Feb'71	H2O brain
m	0	Cath	Ont	---	-	Mar'71	fever
m	1	CofE	Ont	---	-	Jul'70	burnt
m	0	CofE	Ont	---	-	Mar'70	infla. chest
f	27	Cath	Ont	---	m	Jan'71	liver complai
M	1	PRES	ONT	---	-	MAY'71	SCARLET FEVER
f	64	Meth	Ont	---	m	Aug'70	consumption
f	16	Meth	Ont	---	-	Jul'70	heart dis.
				Sub-District E--Barrie, town			
f	1	CofE	Ont	---	-	Mar'71	infla.
m	32	Meth	Ont	tailor	m	Mar'71	infla. lungs
f	1	Meth	Ont	---	-	Apr'71	infla. lungs
f	57	CofE	Ire	---	w	Feb'71	consumption
m	0	Meth	Ont	---	-	Feb'71	unknown
f	61	Cath	Ire	---	w	Dec'70	consumption
m	0	CofE	Ont	---	-	Oct'70	unknown
f	45	Cath	Ire	---	m	Mar'71	infla. lungs
f	2	Pres	U.S.	---	-	Sep'70	diarrhoea
m	16	CofE	Eng	---	-	May'71	purpula
f	3	CofE	Can	---	-	Jul'70	infla.
f	1	CofE	Can	---	-	Aug'70	measles
f	33	Pres	Can	---	m	Dec'70	consumption
m	33	Pres	Can	sawyer	m	Apr'71	consumption
m	65	Cong	Ire	millwright	m	Aug'70	---
f	2	Cong	Eng	---	-	Jun'70	bronchitis
m	14	CofE	Ont	---	-	Apr'71	heart dis.
f	1	CofE	Eng	---	-	Jul'70	---
f	8	CofE	Ont	---	-	Jan'71	dropsy
m	2	O	Ont	---	-	Sep'70	dyssentery

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
m	20	O	Ont	printer	-	Nov'70	heart dis.
m	59	Meth	Ire	labourer	m	Jul'70	bronchitis
f	24	Meth	Ont	---	-	Jan'71	---
f	1	Meth	Ont	---	-	Feb'71	---
m	1	Pres	Ont	---	-	Feb'71	croup
m	2	CofE	Eng	---	-	Jun'70	irr. brain
f	1	CofE	Eng	---	-	Jul'70	diarrhoea
				Sub-District F--Flos, township			
f	73	CofE	Ire	---	w	Mar'71	old age
m	0	Cath	Ont	---	-	Jan'71	---
m	21	Cath	Ont	farmer	-	Oct'70	---
m	69	Meth	Ire	farmer	m	Jan'71	old age
f	73	Pres	Scot	---	w	Nov'70	---
f	30	Cath	Ire	---	m	Dec'70	childbirth
m	18	CofE	Ont	---	-	May'71	shot
f	28	Pres	Ont	---	m	May'71	infla.
m	23	Meth	Ont	labourer	-	Jun'70	infla.
m	44	Meth	Eng	farmer	m	Oct'70	accident
				Sub-District G--Tiny, township			
f	0	CofE	Ont	---	-	May'71	infla. lungs
f	0	CofE	Ont	---	-	Sep'70	---
f	0	Meth	Ont	---	-	May'71	---
f	25	Cath	Que	---	-	Jul'70	dropsy
f	0	Cath	Ont	---	-	Apr'71	---
f	33	Cath	Ont	---	-	Oct'70	---
m	4	Cath	Ont	---	-	Mar'71	---
f	85	Cath	Ire	---	-	May'71	---
f	0	---	Ont	---	-	???	---
f	10	Cath	Que	---	-	May'71	---
m	0	Cath	Ont	---	-	Apr'71	---
f	0	Cath	Ont	---	-	Jul'70	---
m	4	Cath	Ont	---	-	Jan'71	---
f	2	Cath	Ont	---	-	Jan'71	---
m	38	Cath	Que	farmer	-	Sep'70	---
m	0	Cath	Ont	---	-	Aug'70	cholera
m	?	Cath	Que	farmer	w	Feb'71	---
m	0	Cath	Ont	---	-	Feb'71	---
m	0	Cath	Ont	---	-	Oct'70	---
m	12	Cath	Que	---	-	Jun'70	---
f	38	CofE	Ire	---	w	Jan'71	white swell
m	21	Meth	Ont	hunter	-	Feb'71	consumption
f	18	Meth	Ont	---	-	Sep'70	consumption
f	0	---	Ont	---	-	Feb'71	dis. bowels
m	35	Meth	Ont	---	w	Oct'70	consumption
m	4	---	Ont	---	-	Feb'71	fever
m	2	---	Ont	---	-	Oct'70	bowel complai

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	44	Meth	Ont	---	m	Jun'70	consumption
m	2	---	Ont	---	-	Sep'70	bowel complai
f	2	---	Ont	---	-	Sep'70	bowel complai
f	0	---	Ont	---	-	Mar'71	consumption
				Sub-District H--Tay, township			
m	84	CofE	Eng	shipwright	w	May'71	dropsy
f	26	CofE	Ont	---	m	May'71	apoplexy
f	28	Cath	Que	---	m	Jan'71	childbirth
f	53	CofE	Eng	---	m	Mar'71	palpitation
f	20	Cath	Ont	---	m	Jan'71	consumption
m	0	Cath	Ont	---	-	Jul'70	fever
f	20	Cath	Ont	---	-	May'71	consumption
m	0	Cath	Ont	---	-	Dec'70	???
f	1	Cath	Ont	---	-	Jun'70	diarrhoea
m	20	CofE	Germ	labourer	-	Jul'70	dis. bowels
m	0	CofE	Ont	---	-	Mar'71	constipation
f	52	CofE	Ire	---	m	Apr'71	liver complai
m	27	CofE	U.S.	carpenter	m	Feb'71	liver complai
m	70	CofE	Eng	sailor	m	Apr'71	heart dis.
f	15	Pres	Ont	---	-	Oct'70	???
f	1	Pres	Ont	---	-	Mar'71	consumption
m	0	CofE	Ont	---	-	Mar'71	hives
m	0	Pres	Ont	---	-	Mar'71	unknown
f	45	Meth	Que	---	m	Dec'70	consumption
m	0	Cath	Ont	---	-	Oct'70	unknown
m	0	Cath	Ont	---	-	Feb'71	unknown
m	0	Meth	Ont	---	-	Sep'70	infla. lungs
				Sub-District I--Medonte, township			
m	65	Meth	Eng	merchant	w	Feb'71	---
m	3	Meth	Ont	---	-	Mar'71	accident
f	0	CofE	Ont	---	-	Jul'70	birth
f	0	CofE	Ont	---	-	Jul'70	birth
m	0	Pres	Ont	---	-	Feb'71	---
m	83	CofE	Eng	farmer	m	Aug'70	old age
f	25	Meth	Ont	---	m	Jun'70	---
f	54	Pres	Que	---	w	Jul'70	cancer
f	44	Cath	Ire	---	m	Nov'70	---
m	60	Meth	Ire	farmer	m	Jul'70	cancer
f	40	Pres	Ire	---	-	Apr'70	dyssentery
m	62	CofE	Eng	farmer	w	Dec'70	---
f	61	Meth	Eng	---	m	Sep'70	dropsy
f	0	Cath	Ont	---	-	Apr'71	---
m	69	CofE	Ire	farmer	w	Apr'71	---
f	38	CofE	Ont	---	m	May'71	consumption
m	62	Meth	Scot	farmer	m	Jul'70	kidney dis.
m	0	Meth	Ont	---	-	Mar'71	sore mouth

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	1	Meth	Ont	---	-	Jul'70	diarrhoea
m	0	Cath	Ont	---	-	Jun'70	---
m	0	Cath	Ont	---	-	Apr'71	---
m	55	???	Scot	farmer	m	Jun'70	consumption
m	73	CofE	Eng	editor	m	Jun'70	infla. lungs
m	2	???	Ont	---	-	Jul'70	summer compla
m	5	CofE	Ont	---	-	Mar'71	unknown
m	0	Meth	Ont	farmer	-	Feb'71	---
m	0	Pres	Ont	farmer	-	Jul'70	bowel complai

Sub-District J--Oro, township

f	55	Pres	Scot	---	m	Apr'71	bronchitis
m	1	Meth	Ont	---	-	Mar'71	infla. spine
f	2	Meth	Ont	---	-	Sep'70	dis. brain
f	0	CofE	Ont	---	-	Aug'70	sore mouth
m	47	CofE	Eng	labourer	m	Nov'70	paralysed
m	7	Pres	Ont	---	-	Jun'70	dis. brain
m	66	Pres	Scot	blacksmith	m	Apr'71	heart dis.
m	0	Pres	Ont	---	-	Mar'71	---
f	0	Pres	Ont	---	-	Jul'70	spine fever
f	1	Cath	Ont	---	-	Jul'70	inter. fever
f	43	Pres	Eng	---	m	Dec'70	consumption
m	0	Bapt	Ont	---	-	Sep'70	fever
m	60	Quak	unkn	labourer	m	Mar'71	cancer
f	0	---	Ont	---	-	Dec'70	stillborn
f	18	Pres	Ont	---	-	Sep'70	typhus fever
m	1	Pres	Ont	---	-	Aug'70	brain fever
f	0	Pres	Ont	---	-	Feb'71	infla. lungs
m	85	CofE	Que	carpenter	m	May'71	old age
m	28	Pres	Ont	farmer	-	May'71	accident
f	79	Bapt	Eng	---	m	Dec'70	asthma
m	1	Meth	Ont	---	-	Jun'70	fits
f	72	Pres	Scot	---	-	Mar'71	consumption
m	0	X'n	Ont	---	-	Jul'70	infla. lungs
m	0	Meth	Ont	---	-	Mar'71	infla. lungs
m	32	Pres	Ont	farmer	w	Dec'70	liver complai
f	80	Pres	Scot	---	w	Jun'70	dropsy
f	42	Pres	Scot	---	m	Mar'71	rheumatism
f	0	Pres	Ont	---	-	May'71	stillborn
f	0	Pres	Ont	---	-	Jul'70	infla.
f	0	Pres	Ont	---	-	Aug'70	infla. bowels
f	0	CofE	Ont	---	-	Aug'70	thrush
f	68	Pres	Scot	---	w	Sep'70	paralysis
F	2	PRES	ONT	---	-	DEC'70	SCARLET FEVER
m	22	Cath	Ont	store clerk	-	Apr'71	dropsy
m	0	---	Ont	---	-	Jul'70	stillborn
m	24	Pres	Ont	sch.teacher	-	Nov'70	consumption
m	0	Cong	Ont	---	-	Feb'71	infla.
f	0	Pres	Ont	---	-	Mar'71	stillborn

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	0	CofE	Ont	---	-	Mar'71	infla. lungs
				Sub-District K--Orillia, township			
m	0	Cath	Ont	---	-	Feb'71	---
f	36	Pres	Ire	---	m	Nov'70	cancer
f	6	Pres	Ont	---	-	Sep'70	burned
m	3	CofE	Ont	---	-	Sep'70	drowned
m	5	CofE	Ont	---	-	Dec'70	hip dis.
m	93	Cath	Ire	farmer	w	Mar'71	old age
f	65	Cath	Ire	---	m	Dec'70	---
f	0	Pres	Ont	---	-	Apr'71	---
f	52	Cath	Ire	---	m	Oct'70	infla. lungs
f	51	CofE	Ont	---	m	Feb'71	falling womb
m	1	Meth	Ont	---	-	Jul'70	diarrhoea
f	0	CofE	Ont	---	-	Apr'71	conges. lungs
F	4	PRES	ONT	---	-	OCT'70	SCARLET FEVER
F	3	COFE	ONT	---	-	AUG'70	SCARLET FEVER
				Sub-District L--Orillia, village			
f	3	Meth	Ont	---	-	Jan'71	croup
f	21	Pres	Scot	---	m	Jul'70	childbirth
f	1	CofE	Ont	---	-	Jun'70	brain fever
m	51	CofE	U.S.	miller	m	Mar'71	infla. bowels
m	2	Pres	Ont	---	-	Oct'70	cold
f	0	Pres	Ont	---	-	Mar'71	infla. lungs
f	3	Meth	Ont	---	-	Oct'70	diphtheria
m	20	CofE	Ont	student	-	Aug'70	conges. brain
f	0	CofE	Ont	---	-	Sep'70	conges. brain
f	4	Meth	Ont	---	-	Sep'70	diphtheria
m	0	Meth	Ont	---	-	Jul'70	unknown

APPENDIX G

1871 MANUSCRIPT CENSUS--microfilm #9919, 9920
Province of Ontario, District no. 19 Welland,
Nominal Return of Deaths, June 1, 1870-May 31, 1871

* Scarlet fever deaths are highlighted by bold, upper-case print.

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
				Sub-District A--Humberstone, township			
f	17	---	Ont	---	-	Apr'71	consumption
f	56	Meth	Ont	---	w	Sep'70	inflammation
m	0	Luth	Ont	---	-	Sep'70	fits
f	16	Prot	Ont	---	-	Sep'70	consumption
m	0	Luth	Ont	---	-	Feb'71	infla. lungs
m	0	---	Ont	---	-	Feb'71	spinal irrit.
m	77	Luth	Fra	pedler	w	May'71	infla. bowel
f	2	Luth	Ont	---	-	Oct'70	bloody flux
m	32	Luth	Ont	blacksmith	m	May'71	inflammation
m	63	Luth	Ger	farmer	m	Aug'70	apoplexy
f	83	Cath	Fra	---	m	Aug'70	old age
M	**3**	**CATH**	**ONT**	**---**	**-**	**MAY'71**	**SCARLET FEVER**
M	**5**	**CATH**	**ONT**	**---**	**-**	**MAY'71**	**SCARLET FEVER**
f	77	Cath	Fra	---	m	Dec'70	old age
m	48	Cath	Fra	farmer	m	Jan'71	consumption
M	**3**	**BRETH**	**ONT**	**---**	**-**	**MAY'71**	**SCARLET FEVER**
m	43	Luth	Ger	farmer	-	Jan'71	consumption
m	6	Meno	Ont	---	-	Aug'70	diarrhoea
m	53	Luth	Ont	farmer	m	Nov'70	accident
m	53	Meth	Ont	farmer	w	Aug'70	consumption
				Sub-District B--Port Colbourne, village			
f	0	CofE	Ont	---	-	Sep'70	wh. cough
m	0	CofE	Ont	---	-	Aug'70	diarrhoea
m	5	CofE	Ont	---	-	Jul'70	typhoid fever
f	0	Bapt	Ont	---	-	Aug'70	cholera
m	1	Prot	Ont	---	-	Sep'70	diarrhoea
m	0	Cath	Ont	---	-	Jul'70	diarrhoea
f	0	Cath	Ont	---	-	Jul'70	diarrhoea
m	93	Cath	Ire	farmer	m	Dec'70	debility
m	51	Prot	Ont	---	m	Dec'70	tumor
m	0	Luth	U.S.	---	-	May'71	wh. cough
m	71	Luth	Ont	---	-	Sep'70	typhoid fever
m	61	Cath	Ire	labourer	m	Nov'70	heart dis.
f	26	?	Ont	---	-	Nov'70	consumption
				Sub-District C--Bertie, township			
f	26	Epis	Ont	---	m	Mar'71	heart dis.

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	1	Meth	Ont	---	-	May'71	consumption
m	56	Breth	Ont	labourer	m	Jan'71	broken leg
m	57	Epis	Eng	cooper	m	Apr'71	shot
f	43	Epis	Ont	---	-	Oct'70	heart dis.
m	75	Meth	Ont	farmer	m	Mar'71	heart dis.
m	0	Meth	Ont	---	-	Jul'70	H2O on brain
m	28	Meth	Ont	farmer	-	Mar'71	consumption
f	0	Meth	Ont	---	-	May'71	fits
f	47	CofE	Ont	---	m	Nov'70	tumor
f	1	CofE	Ont	---	-	Sep'70	bloody flux
f	84	Pres	Ire	---	m	Jun'70	palsey
f	4	---	Ont	---	-	Apr'71	spine dis.
m	79	Meth	N.S.	farmer	w	Oct'70	debility
m	0	---	Ont	---	-	Sep'70	---
f	42	Luth	Ger	---	m	Aug'70	typhoid fever
m	0	---	Ont	---	-	Aug'70	brain fever
m	1	---	Ont	---	-	Oct'70	bloody flux
m	1	---	Ont	---	-	Nov'70	bloody flux
f	3	---	Ont	---	-	Aug'70	dysentery
f	26	Pres	Ire	---	m	Sep'70	dysentery
m	0	---	U.S.	---	-	Feb'71	unknown
m	96	Meno	U.S.	---	m	Nov'70	debility
m	0	---	Ont	---	-	Aug'70	conges.brain
f	25	Meno	Ont	---	-	Oct'70	consumption
f	0	---	Ont	---	-	Oct'70	unknown
f	0	---	Ont	---	-	Oct'70	unknown
m	0	---	Ont	---	-	Aug'70	---
m	16	---	Ont	---	-	Sep'70	heart dis.
m	0	---	Ont	---	-	Mar'71	inflammation
m	0	---	Ont	---	-	Jul'70	brain fever
f	24	Epis	Ont	---	m	Mar'70	heart dis.
m	30	?	Ont	farmer	m	May'71	fever
f	66	Luth	Ger	---	w	Dec'70	---
m	64	CofE	Ger	farmer	m	Aug'70	cancer
m	75	CofE	U.S.	farmer	m	Jun'70	heart dis.
f	20	CofE	U.S.	---	-	May'71	consumption
m	64	Meno	Ont	farmer	m	Mar'71	dispep.fever
m	0	---	Ont	---	-	Jul'70	teething

Sub-District D--Fort Erie, village

f	6	Cath	U.S.	---	-	Dec'70	brain fever
m	1	Meth	U.S.	---	-	Aug'70	cholera
m	5	Meth	Ont	---	-	Jun'70	---
f	39	Cath	E.Ind	---	-	Apr'71	---
f	46	CofE	Ont	---	m	Mar'71	typhoid fever
m	0	CofE	Ont	---	-	Mar'71	convulsions
m	12	CofE	Ont	---	-	Apr'71	consumption
m	47	Pres	Scot	engineer	m	Aug'70	paralysis
m	0	CofE	Ont	---	-	Feb'71	infla. bowel

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	0	Meth	Ont	---	-	Dec'70	---
m	77	?	---	---	w	Jun'70	old age
m	0	Cath	Ont	---	-	Aug'70	dysentery
				Sub-District E--Crowland, township			
m	13	Meth	Ont	---	-	Jun'70	rheuma.fever
m	0	CofE	Ont	---	-	Aug'70	convulsions
m	0	Pres	Ont	---	-	Jul'70	canker.throat
f	38	CofE	Ont	---	m	Aug'70	child birth
f	29	Meth	Ont	---	-	Feb'71	consumption
f	44	Meth	Ont	---	-	Apr'71	infla. lungs
m	0	?	Ont	---	-	Mar'71	convulsions
m	37	Pres	Scot	farmer	m	Oct'70	gastric fever
f	63	Meth	Ont	---	w	Aug'70	bilious fever
m	0	?	Ont	---	-	Mar'71	diptheria
m	4	?	Ont	---	-	Sep'70	brain fever
f	46	Meth	Ont	---	-	Mar'71	tumor
f	18	?	Ont	---	m	Sep'70	infla. bowel
f	67	Pres	Ont	---	w	Mar'71	asthma
m	0	?	Ont	---	-	Mar'71	infla. brain
f	8	Bapt	Ont	---	-	Aug'70	drowned
				Sub-District F--Welland, village			
m	44	Epis	Wales	mason	m	Apr'71	drowned
m	0	Meth	Ont	---	-	Aug'70	cholera
m	1	Meth	Ont	---	-	Mar'71	croup
f	1	Epis	Ont	---	-	Aug'70	H2O on brain
m	0	---	Ont	---	-	Dec'70	---
f	1	---	Ont	---	-	Feb'71	wh. cough
f	1	---	Ont	---	-	Feb'71	wh. cough
m	22	Epis	Ont	blacksmith	-	Mar'71	consumption
m	24	Epis	Eng	shoemaker	m	Sep'70	concussion
m	1	Meth	Ont	---	-	May'71	H2O on brain
m	0	---	Ont	---	-	Feb'71	---
m	1	Bapt	Ont	---	-	Feb'71	wh. cough
f	0	---	Ont	---	-	Apr'71	---
f	0	---	Ont	---	-	Feb'71	---
m	0	---	Ont	---	-	Jul'70	---
f	35	Pres	Ont	---	m	Jul'70	consumption
f	58	Cath	Ire	---	w	Mar'71	paralysis
m	46	Cath	Ire	dredgeman	m	Nov'70	accident
m	0	Cath	Ont	---	-	Sep'70	fever
f	62	Quak	Ont	---	m	Oct'70	infla. bowel
				Sub-District G--Willoughby, township			
f	70	Meno	Ont	---	w	Jul'70	typhoid fever
f	70	Meth	Ont	---	m	Jul'70	old age

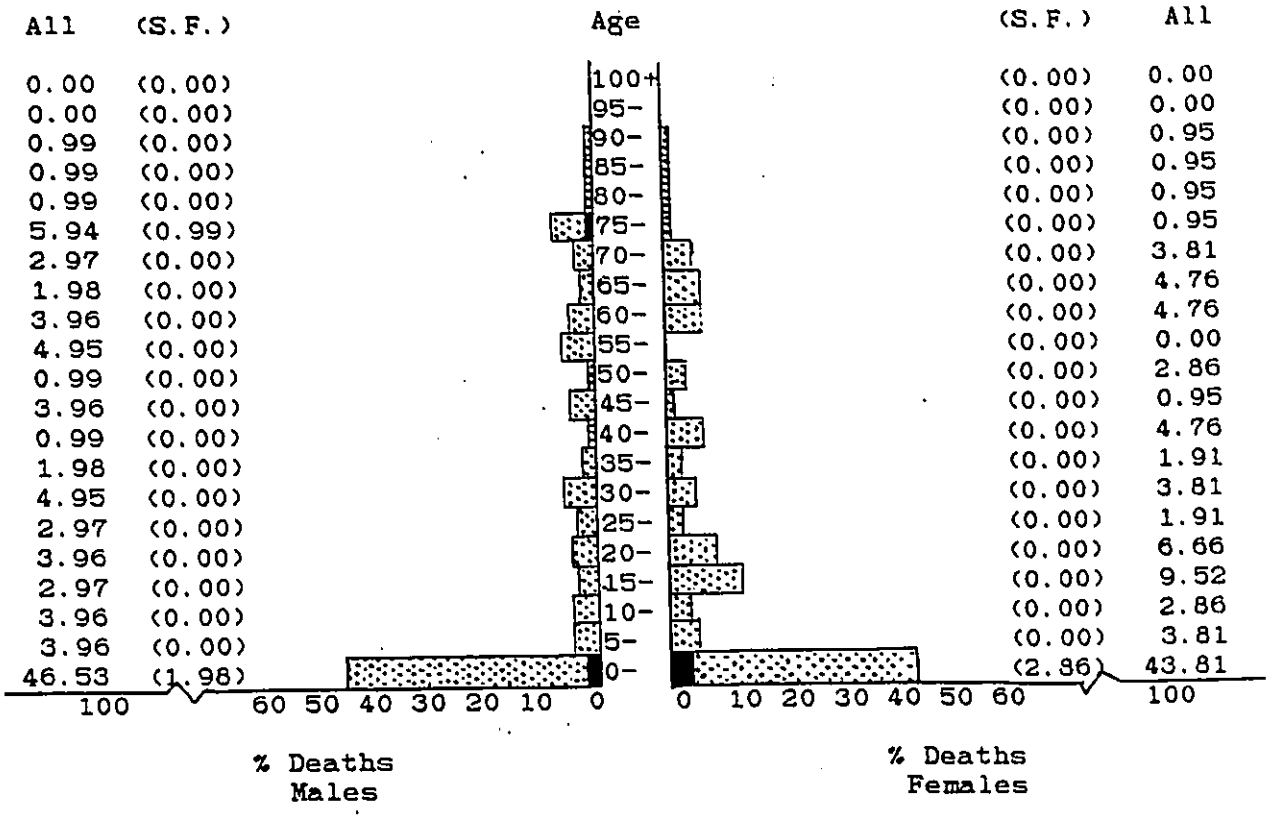
Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
				Sub-District H--Thorold, township			
m	6	---	Ont	---	-	Nov'70	fever
m	2	Meth	Ont	---	-	Aug'70	infla. bowel
f	11	Meth	Ont	---	-	Jun'70	infla. lungs
m	72	Meth	Ont	---	w	Sep'70	typhoid fever
f	32	Meth	Ont	---	m	Jan'71	confinement
m	25	---	Ont	farmer	-	Jun'70	infla. lungs
f	90	---	U.S.	---	w	Jan'71	old age
m	40	Quak	Eng	---	m	Jan'71	infla. liver
f	0	---	Que	---	-	Jan'71	unknown
f	53	?	Ger	---	m	May'71	cancer
f	0	Cath	Ont	---	-	Mar'71	consumption
f	0	---	Ont	---	-	Apr'71	unknown
f	0	Cath	Ont	---	-	Feb'71	heart dis.
m	6	---	Ont	---	-	Aug'70	drowned
m	0	CofE	Ont	---	-	Oct'70	fever
f	1	---	Ont	---	-	Jun'70	drowned
f	12	CofE	Ont	---	-	May'71	typhoid fever
f	5	---	Ont	---	-	Apr'71	unknown
m	61	---	Que	merchant	m	Jan'71	---
f	32	Bapt	Ont	---	m	Apr'71	heart dis.
m	25	Pres	Ger	machinist	-	Nov'70	abcess
m	65	Meth	U.S.	farmer	m	Feb'71	consumption
f	80	Meth	Ont	---	w	May'71	old age
f	56	Meth	Ont	---	-	Feb'71	infla. lungs
f	38	Meth	Ont	---	m	Dec'70	---
m	49	Bapt	Ont	farmer	m	Aug'70	epilepsy
m	67	Meth	Ont	farmer	m	Feb'71	heart dis.
f	0	---	Ont	---	-	Jan'71	---
				Sub-District I--Thorold, village			
f	20	Cath	Ont	---	-	Feb'71	heart dis.
f	47	Cath	Ire	---	m	Mar'71	apoplexy
f	6	CofE	Que	---	-	Aug'70	typhoid fever
f	0	CofE	Ont	---	-	Feb'71	---
f	0	Meth	Ont	---	-	Mar'71	infla. lungs
m	1	CofE	Ont	---	-	Apr'71	dis. brain
m	64	Pres	Scot	pattern mkr	m	Jan'71	erysipelas
m	82	CofE	Ont	---	-	Jul'70	dis. brain
f	4	CofE	Ont	---	-	Feb'71	dis. kidneys
f	0	Meth	Ont	---	-	Oct'70	dis. brain
f	0	Meth	Ont	---	-	Sep'70	---
m	0	Meth	Ire	---	-	Feb'71	dis. lungs
m	0	Meth	Eng	---	-	Sep'70	---
m	70	Cath	Ire	? cutter	m	Nov'70	dis. heart
f	37	CofE	Ont	---	-	Jul'70	---
m	21	Cath	Ont	carpenter	-	Jul'70	infla. lungs
m	53	Meth	U.S.	carpenter	m	Oct'70	consumption

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
f	78	Cath	Ire	---	m	Oct'70	---
f	9	Meth	Ont	---	-	Aug'70	burned
m	27	CofE	Ont	clerk	-	Oct'70	typhoid fever
f	2	Cath	Ont	---	-	Mar'71	dis. lungs
m	0	Cath	Ont	---	-	Jan'71	---
f	64	Meth	Eng	---	w	Jan'71	dis. heart
				Sub-District J--Stamford, township			
f	13	CofE	Ont	---	-	May'71	infla. lungs
m	51	Meth	U.S.	stone mason	m	Sep'70	decline
f	58	Meth	Ont	---	m	May'71	cancer
f	82	CofE	Ont	---	w	Feb'71	old age
m	0	Pres	Ont	---	-	Aug'70	cholera
m	0	---	Ont	---	-	Jan'71	still born
m	69	CofE	Ont	farmer	m	Jan'71	conges. lungs
m	0	---	Ont	---	-	Aug'70	diptheria
f	?	---	Ont	---	-	Feb'71	dis. brain
f	42	Meth	Ont	---	m	Mar'71	consumption
m	42	Pres	^Scot	yard keeper	m	Apr'71	gastric fever
m	55	Cath	Ire	labourer	m	Jan'71	unknown
f	86	Cath	Ire	---	m	Aug'70	old age
m	61	CofE	Eng	plasterer	m	Jan'71	dis. kidney
f	62	Meth	Ont	---	w	Mar'71	consumption
m	40	Pres	Scot	labourer	m	Dec'70	abcess
m	0	---	Ont	---	-	Dec'70	unknown
m	66	CofE	Eng	baker	w	Oct'70	insane
f	39	Meth	Scot	---	m	Jul'70	consumption
f	0	---	Ont	---	-	May'71	wh. cough
m	69	Pres	U.S.	farmer	m	Aug'71	gravel
m	80	---	U.S.	labourer	w	Jun'70	old age
f	72	Cath	Ire	---	w	Nov'70	heart dis.
f	1	Cath	Ont	---	-	Mar'71	unknown
f	56	Cath	Ire	---	w	Mar'71	heart dis.
m	60	Cath	Ire	labourer	m	Feb'71	?
f	27	CofE	Ire	---	m	Mar'71	?
m	0	CofE	Ont	---	-	Mar'71	unknown
f	71	Bapt	Eng	---	m	Jun'70	heart dis.
f	60	Bapt	Eng	---	w	Oct'70	palsey
				Sub-District K--Chippewa, village			
m	13	Luth	Ont	---	-	Jun'70	accident
m	96	CofE	Ire	labourer	m	Nov'70	old age
f	6	CofE	Ont	---	-	Dec'70	croup
m	0	CofE	Ont	---	-	Mar'71	weakness
f	3	CofE	Ont	---	-	Apr'71	fever
f	70	Pres	Scot	---	w	Sep'70	paralysis
m	54	Cath	Ire	labourer	m	Mar'71	infla. kidney

Sex	Age	Relig	Birth	Occupation	Mar?	Month	Cause
				Sub-District L--Clifton, town			
m	42	Pres	Scot	labourer	m	Mar'71	accident
f	37	Cath	Ire	---	m	Jun'70	heart dis.
m	0	Cath	Ont	---	-	---	---
f	0	Cath	Ont	---	-	---	---
m	78	CofE	Eng	labourer	w	---	diarrhoea
f	90	Cath	Ire	---	w	Aug'70	old age
m	0	CofE	Ont	---	-	Oct'70	---
m	39	Meth	U.S.	servant	m	---	shot
f	0	CofE	Ont	---	-	Mar'71	---
m	26	CofE	Que	labourer	m	Apr'70	---
f	17	Cath	Que	---	-	Nov'70	dropsy
m	78	CofE	Eng	artist	w	Nov'70	old age
m	73	Meth	Eng	---	m	Dec'70	old age
f	35	Meth	Que	---	m	Jan'71	decline
f	90	Cath	Ire	---	w	Mar'71	old age

APPENDIX H

% DEATHS FROM SCARLET FEVER,
SUPERIMPOSED ON % TOTAL DEATHS,
BY AGE, NORTH WATERLOO COUNTY, ONTARIO, 1871



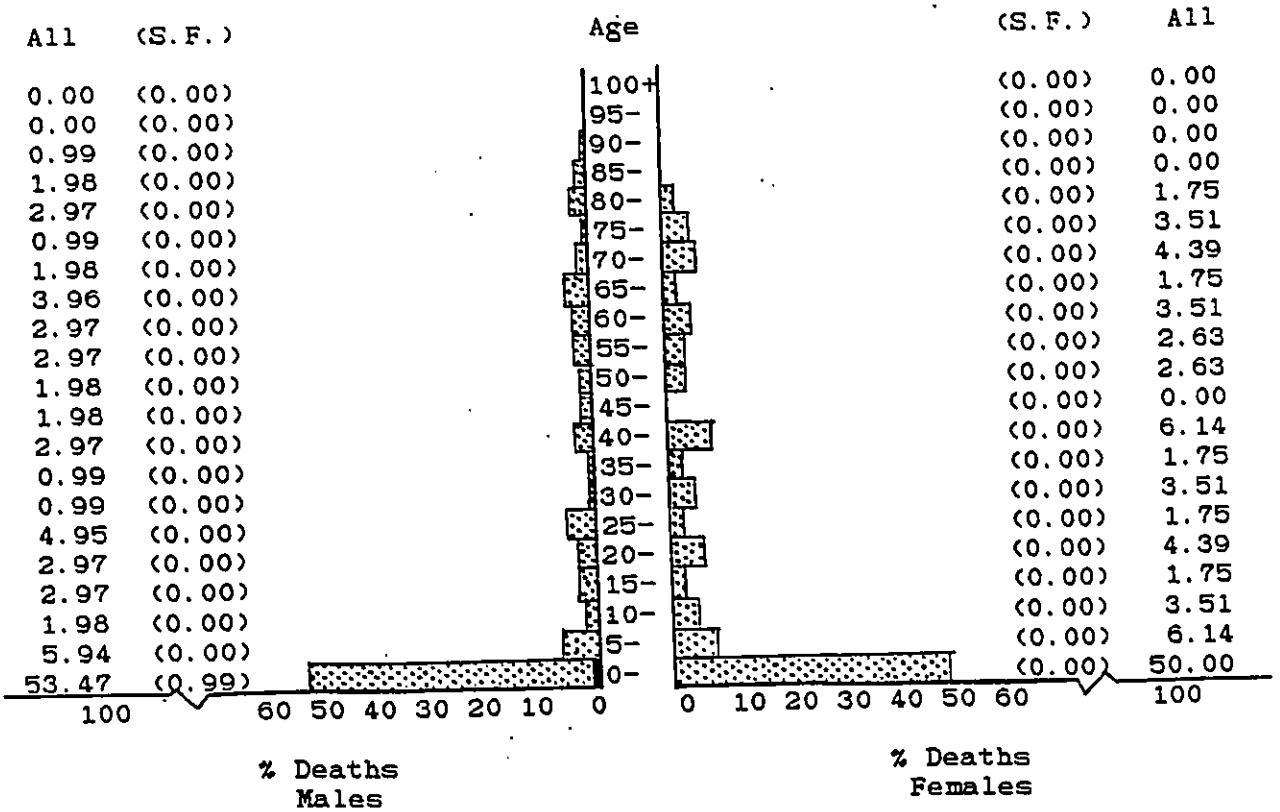
206 Total Deaths--101 Male
105 Female

4 Scarlet Fever Deaths--3 Male
1 Female

* Note: The total living population for 1871 was not provided in five year cohorts, and is therefore not available for comparison.

APPENDIX I

% DEATHS FROM SCARLET FEVER,
SUPERIMPOSED ON % TOTAL DEATHS,
BY AGE, SOUTH BRUCE COUNTY, ONTARIO, 1871



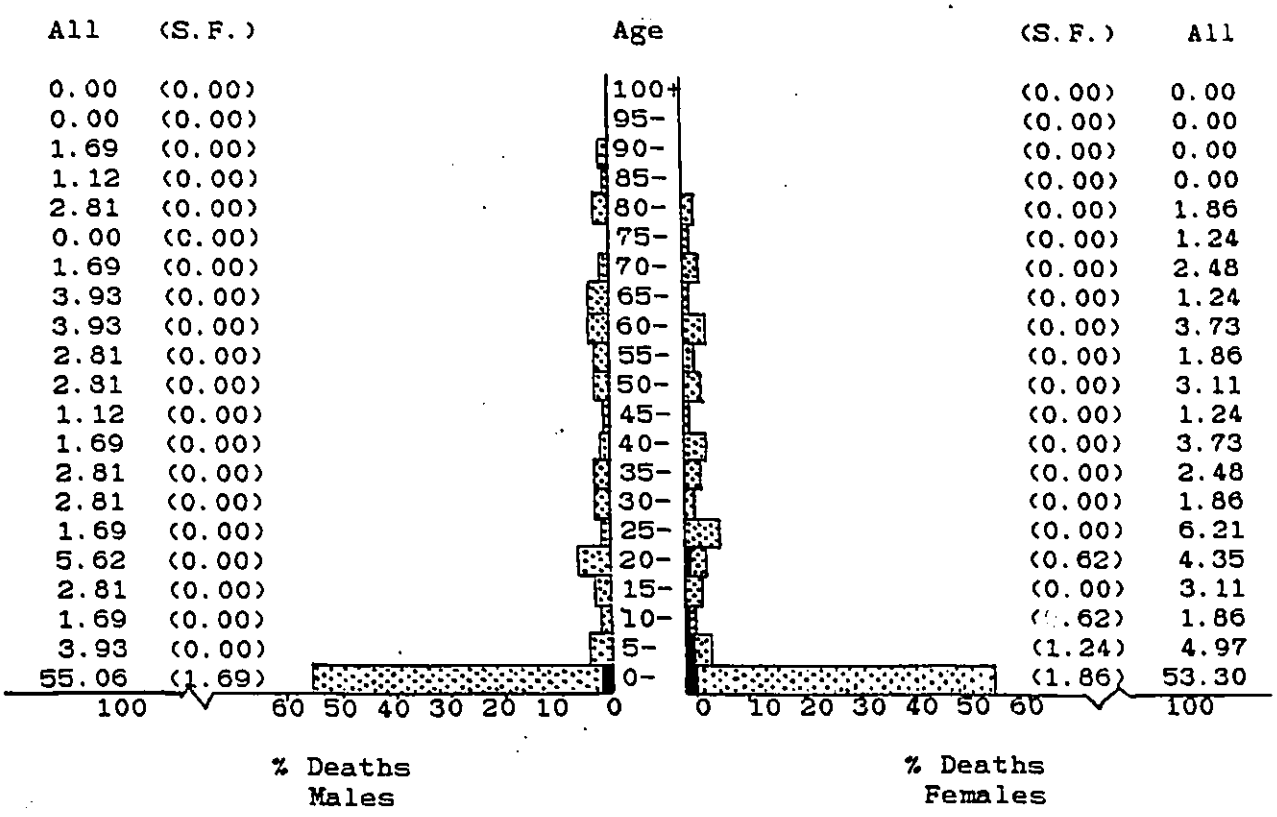
215 Total Deaths--101 Male
114 Female

1 Scarlet Fever Death --1 Male
0 Female

* Note: The total living population for 1871 was not provided in five year cohorts, and is therefore not available for comparison.

APPENDIX J

% DEATHS FROM SCARLET FEVER,
SUPERIMPOSED ON % TOTAL DEATHS,
BY AGE, NORTH SIMCOE COUNTY, ONTARIO, 1871



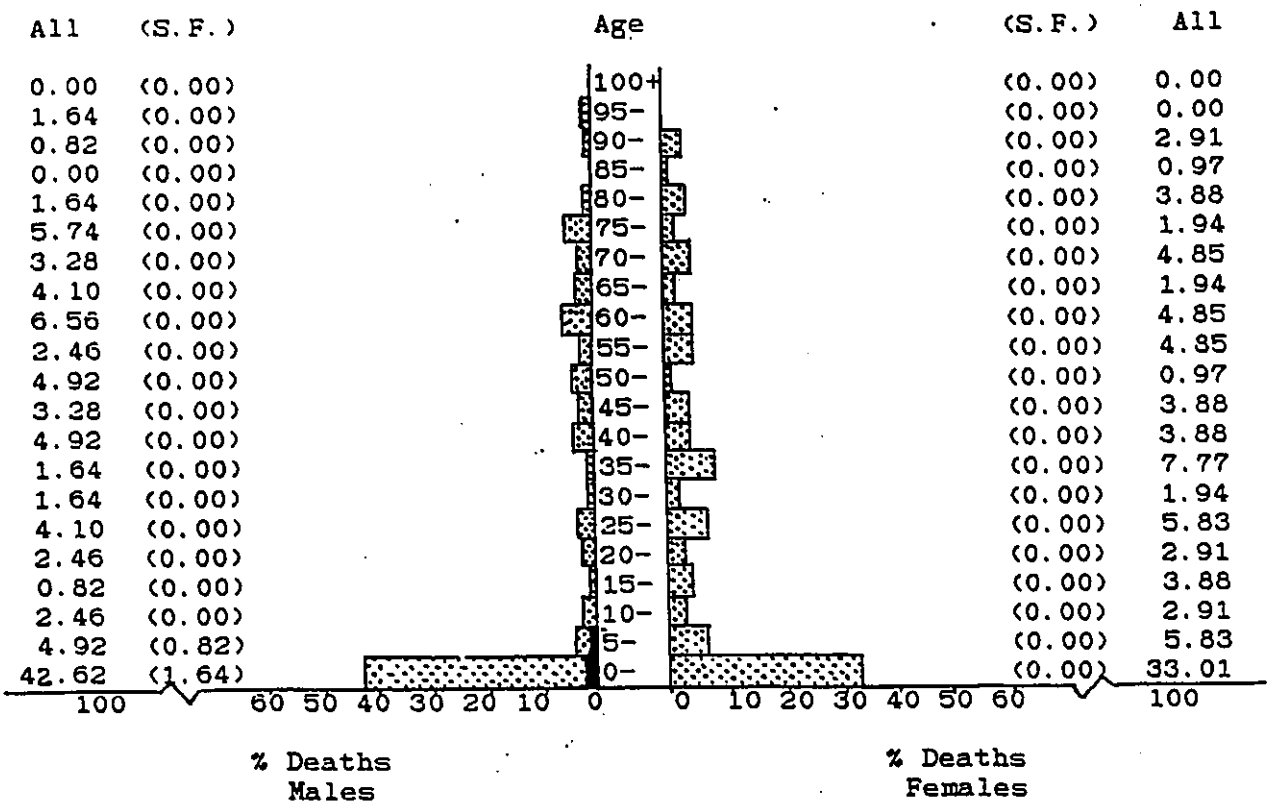
339 Total Deaths--178 Male
161 Female

10 Scarlet Fever Deaths--3 Male
7 Female

* Note: The total living population for 1871 was not provided in five year cohorts, and is therefore not available for comparison.

APPENDIX K

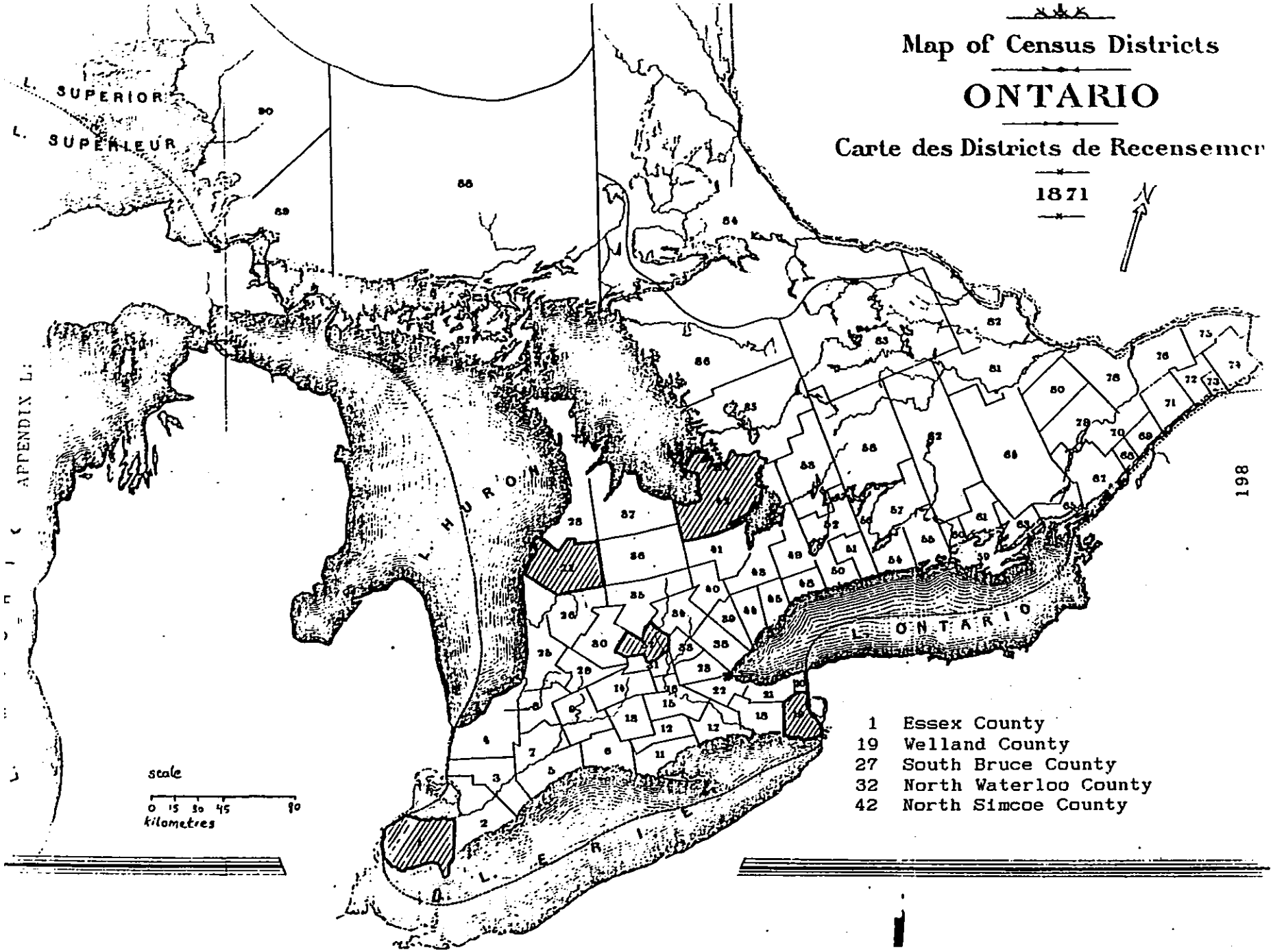
% DEATHS FROM SCARLET FEVER,
SUPERIMPOSED ON % TOTAL DEATHS,
BY AGE, WELLAND COUNTY, ONTARIO, 1871



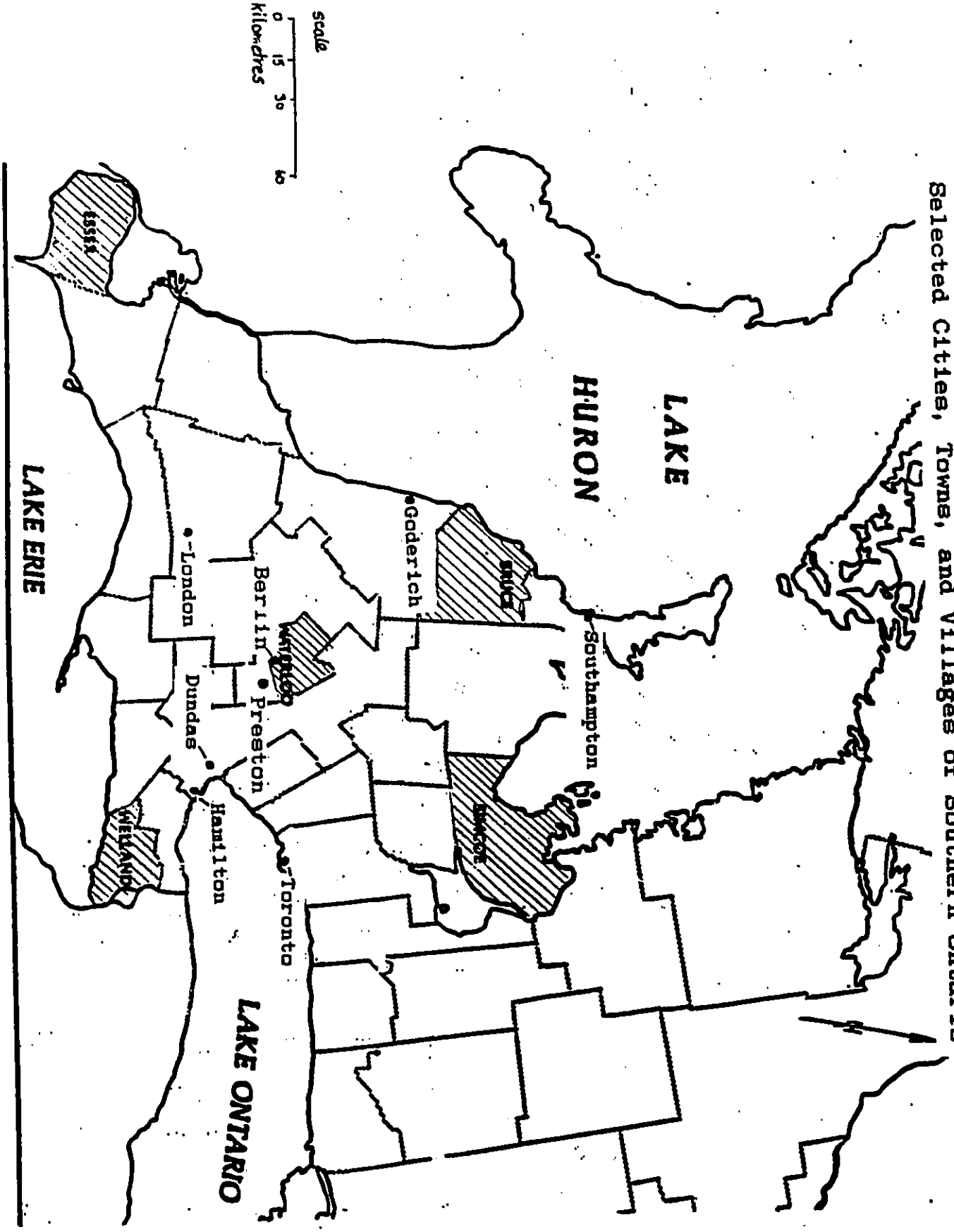
225 Total Deaths--122 Male
103 Female

3 Scarlet Fever Deaths--3 Male
0 Female

* Note: The total living population for 1871 was not provided in five year cohorts, and is therefore not available for comparison.


Map of Census Districts
ONTARIO
Carte des Districts de Recensemer
1871
L. SUPERIOR
L. SUPÉRIEUR
L. HURON
L. ONTARIO
L. ERIE
scale
0 15 30 45 90
kilometres
1 Essex County
19 Welland County
27 South Bruce County
32 North Waterloo County
42 North Simcoe County

Selected Cities, Towns, and Villages of Southern Ontario



BIBLIOGRAPHY

I. BOOKS

Ackerknecht, Erwin Heinz. History and Geography of the Most Important Diseases. New York: Hafner Publishing Company, Inc., 1965.

Anderson, G.W., M.B. Arnstein and M.R. Lester. Communicable Disease Control. New York: MacMillan Company, 1962.

Anderson, Roy M, ed. The Population Dynamics of Infectious Diseases: Theory and Applications. London: Chapman and Hall, 1982.

Ariès, Philipe. The Hour of Our Death. trans. by Helen Weaver. New York: Alfred A. Knopf, 1981.

Ariès, Philipe. Western Attitudes toward DEATH. trans. by Patricia M. Ranum. Baltimore and London: The Johns Hopkins University Press, 1974.

Bailey, Norman T.J. The Mathematical Theory of Epidemics. London: C. Griffin, 1957.

Barker, D.J.P. Practical Epidemiology. Edinburgh: Churchill, Livingstone, 1982.

Beaujot, Roderic. Population Change in Canada: The Challenges of Policy Adaptation. Toronto: McClelland & Stewart Inc., 1991.

Bennett, L. Claire and Sarah Searl. Communicable Disease Handbook. New York: John Wiley & Sons, Inc., 1982.

Best, Geoffrey. Mid-Victorian Britain 1851-1875. London: Weidenfeld and Nicolson, 1971.

Bilson, G. A Darkened House: Cholera in the Nineteenth Century. Toronto: University of Toronto Press, 1980.

Bliss, Michael. Plague: A Story of Smallpox in Montreal. Toronto: Harper Collins Publishers, 1991.

Brien, Dr. J.W., M.B., F.A.C.A., F.R.C.A.(c), L.L.D.(McM). The Medical Men of Essex County. Windsor, 1950.

Brockington, C. Fraser. Public Health in the Nineteenth Century. London and Edinburgh: E. & S. Livingstone, 1965.

Brooks, Stewart M., Natalie Paynton Brooks, and Lorelle J. Pelletier. Handbook of Infectious Diseases Boston,

Massachusetts: Stewart M. Brooks and Natalie Paynton Brooks, 1980.

Bull, Wm. Perkins. From Medicine Man to Medical Man: A Record of a Century and a Half of Progress in Health and Sanitation as Exemplified by Developments in Peel. Toronto: The Perkins Bull Foundation, George J. McLeod, Ltd., 1934.

Burn, Joseph. Vital Statistics Explained. London: Constable and Co., 1914.

Burtniak, John. The History of the County of Welland, Ontario, Its Past and Present. Welland: Welland Tribune Printing House, 1987.

Cartwright, Frederick F. A Social History of Medicine. London: Longman, 1977.

Cartwright, Frederick F. Disease and History. New York: Dorset Press, 1992.

Chadwick, Edwin. Report on the Sanitary Conditions of the Labouring Population of Great Britain. Edinburgh, 1965.

Chase, Allen. Magic Shots: A Human and Scientific Account of the Long and Continuing Struggle to Eradicate Infectious Diseases by Vaccination. New York: Morrow, 1982.

Cheeseman, E.A. Epidemics in Schools. Medical Research Council Special Report No. 271, London: HMSO, 1950.

Christie, Andrew Barnett. Infectious Diseases, Epidemiology and Clinical Practice. Edinburgh: E. & S. Livingstone, 1969.

Cliff, Andrew D. and Peter Haggett. Atlas of Disease Distributions: Analytic Approaches to Epidemiological Data. Oxford, England: Blackwell Publishers, 1988.

Cliff, A.D., P. Haggett, and J.K. Ord. Spatial Aspects of Influenza Epidemics. London: Pion, 1986.

Cliff, A.D., P. Haggett, J.K. Ord, and G.R. Versey. Spatial Diffusion: An Historical Geography of Epidemics in an Island Community. Cambridge: Cambridge University Press, 1981.

Corsi, P. and P. Weindling, eds. Information Sources in the History of Science and Medicine. London: Butterworth Scientific, 1983.

Creighton, Charles. The History of Epidemics in Britain. vols. 1 & 2. London: F. Cass, 1965.

Crosby, Alfred W. Epidemic and Peace, 1918. Connecticut: Greenwood Press, 1976.

Dublin, Louis I., ed. Population Problems in the United States and Canada. Boston and New York: Houghton Mifflin Company, 1926.

Dubos, René J. Man Adapting. New Haven: Yale University Press, 1980.

Edginton, Barry. Health, Disease and Medicine in Canada: A Sociological Perspective. Toronto: Butterworths, 1989.

Elderton, W. Palin, and Richard C. Fippard. The Construction of Mortality and Sickness Tables. London: A. and C. Black, Ltd., 1922.

Evans, Alfred S. Viral Infections of Humans: Epidemiology and Control. New York: Plenum Medical Book Co., 1989.

Eyles, John. Social Geography of Medicine and Health. London: Croom Helm, 1983.

Farrell, James J. Inventing the American Way of Death, 1830-1920. Philadelphia: Temple University Press, 1980.

Fieguth, W.W. The Personality of North Simcoe County: A Study in Historical Geography. London: University of Western Ontario, Department of Geography, Occasional Paper No. 2., 1968.

Finer, S.E. The Life and Times of Sir Edwin Chadwick. New York: Barnes & Noble, 1970.

Gagnon, Serge. Mourir hier et aujourd'hui. De la mort chrétienne dans la campagne québécoise au XIXe siècle à la mort technisée dans la cité sans Dieu. Québec: Presses de l'Université Laval, 1987.

Gale, Arthur H. Epidemic Diseases. Harmondsworth: Penguin Books, 1960.

Gateman, Laura M. Echoes of Bruce County (the Land of Beef and Beaches) St. Jacobs: St. Jacobs Printery, 1982.

Gilman, Sander L. Disease and Representation: Images of Illness from Madness to AIDS. Ithaca and London: Cornell University Press, 1988.

Godfrey, C.M. The Cholera Epidemics of Upper Canada, 1832-1866. Toronto: Seccombe House, 1968.

Godfrey, Charles M. Medicine for Ontario: A History. Belleville: Mika Publishers, 1979.

Griffith, G.T. Population Problems of the Age of Malthus. New York: A.M. Kelley, 1967.

A Guide to Waterloo County. published by the Waterloo Trust and Savings Company, 1967.

Heagerty, John J. Four Centuries of Medical History in Canada, and a Sketch of the Medical History of Newfoundland. 2 volumes. Toronto: MacMillan Co. of Canada Limited, 1928.

Heagerty, J.J. The Romance of Medicine in Canada. Toronto: The Ryerson Press, 1940.

Howe, George Melvyn. Man, Environment and Disease in Britain: a Medical Geography of Britain Through the Ages. New York: Barnes & Noble Books, 1972.

Howe, George Melvyn. A World Geography of Human Diseases. London: Academic Press, 1977.

Howell, William Boyman. Medicine in Canada. New York: AMS Press, 1978.

Hunter, Andrew F. A History of Simcoe County. Barrie: Historical Committee of Simcoe County, 1909.

Inglis, B. Fringe Medicine. London: Faber and Faber, 1964.

Jack, Donald. Rogues, Rebels, And Geniuses: The Story of Canadian Medicine. Toronto: Doubleday, 1981.

Jones, Kelvyn. Health, Disease, and Society: A Critical Medical Geography. London: Routledge & Kegan Paul, 1987.

Kalbach, Warren E. and Wayne W. McVey. The Demographic Bases of Canadian Society. Toronto: McGraw-Hill Company of Canada, 1971.

Kearns, Gerard. Urban Epidemics and Historical Geography: Cholera in London, 1848-9. Norwich: published by Geo Books for the Historical Research Group of the Institute of British Geographers, 1985.

Lambert, Royston. Sir John Simon, 1816-1904, and English Social Administration. London: MacGibbon & Kee, 1963.

Learmonth, Andrew Thomas Amos. Patterns of Disease and Hunger. London: David & Charles, 1978.

Learmonth, A.T.A. Disease Ecology: An Introduction. Oxford: Basil Blackwell, 1988.

Leibbrandt, Gottlieb. Little Paradise: The Saga of the German Canadians of Waterloo County, Ontario, 1800-1975. Kitchener: Allprint Company Limited, 1980.

MacDermot, H.E. One Hundred Years of Medicine in Canada, 1867-1967. Toronto: McClelland and Stewart Limited, 1967.

MacDougall, Heather. Activists and Advocates: Toronto's Health Department, 1883-1983. Toronto: Dundurn Press Limited, 1990.

Marks, Geoffrey and William K. Beatty. Epidemics: The Story of Mankind's Most Lethal and Elusive Enemies - From Ancient Times to the Present. New York: Charles Scribner's Sons, 1976.

Mausner, Judith S., M.D., M.P.H. and Anita K. Bahn, ScD., M.D. Epidemiology: An Introductory Text. Philadelphia: W.B. Saunders Company, 1974.

McGrew, Roderick E. Encyclopedia of Medical History. New York: McGraw-Hill, 1985.

McInnes, Mary Elizabeth. Essentials of Communicable Disease. Saint Louis: The C.V. Mosby Company, 1975.

McKeown, Thomas. The Modern Rise of Population. London: Edward Arnold, 1976.

McNeill, William Hardy. Plagues and Peoples. New York: Doubleday, 1976.

Meade, Melinda S. Medical Geography. New York: Guildford Press, 1988.

Mitchinson, Wendy. The Nature of Their Bodies: Women and Their Doctors in Victorian Canada. Toronto: University of Toronto Press, 1991.

Morris, R.J. Cholera 1832: The Social Response to an Epidemic. New York: Holmes & Meier Pub., 1976.

Morrison, Neil F. Garden Gateway to Canada: One Hundred Years of Windsor and Essex County, 1854-1954. Windsor: Herald Press Limited, 1954.

Muntz, Earl E., Ph.D. Urban Sociology. New York: The MacMillan Company, 1938.

Newsholme, Arthur. The Elements of Vital Statistics. London: G. Allen & Unwin Ltd., 1923.

Nnochiri, Enyinnaya, M.D., M.Sc., Ph.D. Textbook of Imported Diseases. Oxford: Oxford University Press, 1979.

Overbeek, Johannes. Population and Canadian Society. Toronto: Butterworth & Co., 1980.

Overton, Frank and Willard J. Denno. The Health Officer. Philadelphia and London: W.B. Saunders Co., 1920.

Pacione, Michael. Medical Geography: Progress and Prospect. London: Croom Helm, 1986

Paradis, A. and H. Naubert, in collaboration with D. Goulet. Récension bibliographique: les maladies infectieuses dans les périodes médicaux québécoise du XIXè siècle. Trois Rivières: Collection "Matèriaux pour l'histoire de la médicine québécoise", Centre recherche en études québécoises, 1988.

Parry, Wilfrid H. Communicable Diseases. London: Hodder and Stoughton, 1979.

Paul, John R. Clinical Epidemiology. Chicago: The University of Chicago Press, 1958.

Pelling, Margaret. Cholera, Fever and English Medicine, 1825-1865. New York: Oxford University Press, 1978.

Pyle, Gerald F. Applied Medical Geography. Washington: V.H. Winston & Sons, 1979.

Richardson, Benjamin Ward. The Health of Nations: A Review of the Works of Edwin Chadwick. 2 volumes. London: Dawsons of Pall Mall, 1965.

Robertson, Norman. The History of the County of Bruce and of the Minor Municipalities Therein. J.M. Dermot & Sons (Canada) Limited, 1906.

Rosenberg, Charles E. The Cholera Years, the United States in 1832, 1849, and 1866. Chicago: University of Chicago Press, 1962.

Schmeckebier, Laurence F. The Public Health Service: Its History, Activities and Organization. Baltimore: The Johns Hopkins Press, 1923.

Siegfried, André. Germs and Ideas: Routes of Epidemics and Ideologies. Edinburgh and London: Oliver & Boyd, 1965.

Sinnecker, Herbert. General Epidemiology. London: John Wiley & Sons, 1976.

Smith, F.B. The People's Health, 1830-1910. New York: Holmes & Meier Publishers, Inc., 1979.

Spink, Wesley W. Infectious Diseases: Prevention and Treatment in the Nineteenth and Twentieth Centuries. Minneapolis: University of Minnesota Press, 1978.

Sutherland, Neil. Children in English-Canadian Society: Framing the Twentieth-Century Consensus. Toronto: University of Toronto Press, 1976.

Thorpe, Ethel L.M. The Social Histories of Smallpox and Tuberculosis in Canada: (Culture, Evolution and Disease). Winnipeg, 1989.

Tiessen, Paul, ed. Berlin, Canada: A Self-Portrait of Kitchener, Ontario Before World War One. St. Jacobs, Ontario: Sand Hills Books, Inc., n.d.

Urquhart, M. Historical Statistics of Canada. Toronto: The MacMillan Company of Canada, 1965.

Uttley, W.V. (Ben). A History of Kitchener, Ontario. Waterloo: Wilfred Laurier University Press, 1975.

Valverde, Mariana. The Age of Light, Soap, and Water: Moral Reform in English Canada, 1885-1925. Toronto: McClelland & Stewart Inc., 1991.

Vilee, Claude Alvin and Vincent Gaston Dethier. Biological Principles and Processes. Philadelphia, London, Toronto: W.B. Saunders Company, 1971.

Wallace, Bruce, ed. Essays in Social Biology. vols. 1, 2 and 3. Englewood Cliffs, N.J.: Prentice Hall, Inc., 1972.

Wells, W.F. Airborne contagion and air hygiene. An Ecological Study of Droplet Infections. Cambridge, Massachusetts: Harvard University Press, 1955.

Whipple, George Chandler. Vital Statistics. New York: John Wiley and Sons, Inc., 1923.

Winslow, Charles-Edward Amory. The Conquest of Epidemic Disease. A Chapter in the History of Ideas. New York: Hafner Publishing Co., 1943.

Wohl, A. Endangered Lives: Public Health in Victorian Britain. Cambridge, MA: Harvard University Press, 1983.

Zinsser, Hans. Rats, Lice and History. Boston: Printed and published for the Atlantic Monthly Press by Little: Brown, 1935.

II. ARTICLES

Anderson, Michael. "The Social Implications of Demographic Change," in F.M.L. Thompson, ed., The Cambridge Social History of Britain, 1750-1950. vol. 2, People and Their Environment. Cambridge: Cambridge University Press, 1990. 1-70.

Ariès, Philipe. "The Reversal of Death: Changes in Attitudes Toward Death in Western Societies," in David E. Stannard, ed., Death in America. trans. by Valerie M. Stannard. Pennsylvania: University of Pennsylvania Press, 1975. 134-158.

Aucoin, Peter. "Federal Health Care Policy," in Carl A. Meilicke and Janet L. Storch, eds., Perspectives on Canadian Health and Social Services Policy: History and Emerging Trends. Ann Arbour, Michigan: Health Administration Press, 1980. 244-268.

Bailey, Norman T.J. "Maximum-likelihood Estimation of the Relative Removal Rate from the Distribution of the Total Size of an Intra-household Epidemic," Journal of Hygiene, Cambridge, 1954, 52: 400-402.

Bailey, Norman T.J. "Significance Tests for a Variable Chance of Infection in Chain-binomial Theory," Biometrika, 1956, 43: 332-336.

Bailey, Norman T.J. "Some Problems in the Statistical Analysis of Epidemic Data," Journal of the Royal Statistical Society, series B, 1955, 17: 35-58.

Bailey, Norman T.J. "The Use of Chain-binomials with a Variable Chance of Infection for the Analysis of Intra-household Epidemics," Biometrika, 1953, 40: 279-286.

Berridge, Virginia. "Health and Medicine," in F.M.L. Thompson, ed., The Cambridge Social History of Britain, 1750-1950, vol. 3, Social Agencies and Institutions. Cambridge: Cambridge University Press, 1990. 171-242.

Bilson, Geoffrey. "Canadian Doctors and the Cholera," in S.E.D. Shortt, ed., Medicine in Canadian Society: Historical Perspectives. Montreal: McGill-Queen's University Press, 1981. 115-136.

Bilson, Geoffrey. "The Cholera Epidemic in Saint John, N.B., 1854," Acadiensis, 1974 4(1): 85-99.

Bordessa, R. and J.M. Cameron. "Sanitation, Water and Health: Two Centuries of Public Health Progress in Toronto," in Frank A. Barrett, ed., Canadian Studies in Medical Geography. Geographical Monographs, No. 8. Downsview: York University, 1980. 121-146.

Bradbury, Bettina. "The Fragmented Family: Family Strategies in the Face of Death, Illness, and Poverty, Montreal, 1860-1885," in Joy Parr, ed., Childhood and Family in Canadian History. Toronto: McClelland & Stewart Limited, 1982. 109-128.

Brotherston, John. "Evolution of Medical Practice," in Gordon McLachlan and Thomas McKeown, eds., Medical History and Medical Care: A Symposium of Perspectives, Arranged by the Nuffield Provincial Hospitals Trust and the Josiah Macy Jr Foundation, London: Oxford University Press, 1971. 87-128.

Cliff, A.D. and P. Haggett "Epidemic Control and Critical Community Size: Spatial Aspects of Eliminating Communicable Diseases in Human Populations," in R.W. Thomas, ed., Spatial Epidemiology. London: Pion Limited, 1990. 93-110.

Coll Martin, Sebastian. "Assessing the Reliability of Early Censuses: The 1818 Spanish "Cuadernos De Riqueza" as a Test Case," Paper presented at the Conference on the Use of Census Manuscripts for Historical Research, March 4-7, 1993, University of Guelph, Guelph, Ontario.

Copp, Terry. "Public Health in Montreal, 1870-1930," in S.E.D. Shortt, ed., Medicine in Canadian Society: Historical Perspectives. Montreal: McGill-Queen's University Press, 1981. 395-416.

Craig, Barbara. "Smallpox in Ontario: Public and Professional Perception of Disease, 1884-1885," in Charles Roland, ed., Health, Disease and Medicine: Essays in Canadian History. Proceedings of the First Hannah Conference on the History of Medicine, McMaster University, June 3-5, 1982. 215-249.

Crellin, J.K. "The Dawn of the Germ Theory: Particles, Infection and Biology," in F.N.L Poynter, ed., Medicine and Science in the 1860s, Proceedings of the Sixth British Congress on the History of Medicine, University of Sussex, 6-9 September, 1967. London: Wellcome Institute of the History of Medicine, 1968. 57-76.

Curtis, Bruce. "The Local Construction of Statistical Knowledge, or Mistaking the 1861 Census," Paper presented at

the Conference on the Use of Census Manuscripts for Historical Research, March 4-7, 1993, University of Guelph, Guelph, Ontario.

Diggle, P.J., A.C. Gatrell, and A.A. Lovett. "Modelling the Prevalence of Cancer of the Larynx in Part of Lancashire: A New Methodology for Spatial Epidemiology," in R.W. Thomas, ed., Spatial Epidemiology. London: Pion Limited, 1990. 35-47.

Douglas, Ann. "Heaven Our Homes: Consolation Literature in the Northern United States, 1830-1880," in David E. Stannard, ed., Death in America. Pennsylvania: University of Pennsylvania Press, 1975. 49-68.

Foster, J. "Nineteenth-Century Towns: A Class Dimension," in M.W. Flinn and T.C. Smout, eds., Essays in Social History. Oxford: Clarendon Press, 1974. 178-196.

French, Stanley. "The Cemetery as Cultural Institution: The Establishment of Mount Auburn and the "Rural Cemetery" Movement," in David E. Stannard, ed., Death in America. Pennsylvania: University of Pennsylvania Press, 1975. 69-91.

Gaffield, Chad. "Children, Schooling, and Family Reproduction in Nineteenth-Century Ontario," Canadian Historical Review, June 1991, 72(2): 157-191.

Gaffield, Chad. "Schooling, the Economy, and Rural Society in Nineteenth-Century Ontario," in Joy Parr, ed., Childhood and Family in Canadian History. Toronto: McClelland & Stewart Limited, 1982. 69-92.

Gidney, R.D. and W.P.J. Millar. "The Origins of Organized Medicine in Ontario, 1850-1869," in Charles G. Roland, ed., Health, Disease and Medicine: Essays in Canadian History. Proceedings of the First Hannah Conference on the History of Medicine, McMaster University, June 3-5, 1982. 65-95.

Hardy, Ann. "Scarlet Fever," in Kenneth F. Kiple, ed., The Cambridge World History of Human Disease. Cambridge: Cambridge University Press, 1993. 990-992.

Hart, Jenifer. "Nineteenth-Century Social Reform: A Tory Interpretation of History," in M.W. Flinn and T.C. Smout, eds., Essays in Social History. Oxford: Clarendon Press, 1974. 197-217.

Hastings, J.E.F. and W. Moseley. "Introduction: The Evolution of Organized Community Health Services in Canada," in Carl A. Meilicke and Janet L. Storch, eds., Perspectives on Canadian Health and Social Services Policy: History and Emerging

Trends. Ann Arbour, Michigan: Health Administration Press, 1980. 145-155.

Heagerty, J.J. "The Development of Public Health in Canada," in Carl A. Meilicke and Janet L. Storch, eds., Perspectives on Canadian Health and Social Services Policy: History and Emerging Trends. Ann Arbour, Michigan: Health Administration Press, 1980. 137-144.

Hodgkinson, Ruth G. "Social Medicine and the Growth of Statistical Information," in F.N.L Poynter, ed., Medicine and Science in the 1860s, Proceedings of the Sixth British Congress on the History of Medicine, University of Sussex, 6-9 September, 1967. London: Wellcome Institute of the History of Medicine, 1968. 183-198.

Hope Simpson, R.E.. "Infectiousness of communicable diseases in the household," Lancet, 1952, 2: 549-554.

Howell, Colin D. "Back to the Bedside: Recent Work on the History of Medicine in Canada," Acadiensis, Spring 1988 17(2): 185-194.

Howell, Colin D. "Elite Doctors and the Development of Scientific Medicine: The Halifax Medical Establishment and 19th Century Medical Professionalism," in Charles G. Roland, ed., Health, Disease and Medicine: Essays in Canadian History. Proceedings of the First Hannah Conference on the History of Medicine, McMaster University, June 3-5, 1982. 105-122.

Howell, Colin and Michael Smith. "Orthodox Medicine and the Health Reform in the Maritimes, 1850-1885," Acadiensis, Spring 1989 18(2): 55-72.

Innes, F. "Medical Geography: A Preliminary Investigation at Two Scales in Ontario," in Frank A. Barrett, ed., Canadian Studies in Medical Gepgraphy. Geographical Monographs, No. 8. Downsview: York University, 1980. 95-119.

Keele, K.D. "Clinical Medicine," in F.N.L Poynter, ed., Medicine and Science in the 1860s, Proceedings of the Sixth British Congress on the History of Medicine, University of Sussex, 6-9 September, 1967. London: Wellcome Institute of the History of Medicine, 1968. 1-12.

Lambert, R.J. "A Victorian National Health Service--State Vaccination, 1855-71," History Journal, 1962, 5: 1-18.

Little, J.I. "Death in the Lower St. John River Valley: The Diary of Alexander Machum, Jr., 1845-1849," Acadiensis, Autumn 1992, 22(1): 122-133.

Logan, W.P.D. "Mortality in England and Wales from 1848 to 1947," Population Studies, 1950, 4: 132-78.

Longstaff, G.B. "The recent decline in the English death rate considered in connection with the cause of death," Journal of the Statistical Society, 1884, 47: 221-58.

Marshall, David B. "Death Abolished: Changing Attitudes Toward Death in Victorian Canada," Paper presented to the annual meeting of the Canadian Historical Association, 1990.

McGinnis, J.P. "A City Faces an Epidemic," Alberta History, 1976, 24(4): 1-11.

McKeown, Thomas. "A Historical Appraisal of the Medical Task," in Gordon McLachlan and Thomas McKeown, eds., Medical History and Medical Care: A symposium of perspectives, Arranged by the Nuffield Provincial Hospitals Trust and the Josiah Macy Jr Foundation, London: Oxford University Press, 1971. 29-55.

McKeown, Thomas. "A Sociological Approach to the History of Medicine," in Gordon McLachlan and Thomas McKeown, eds., Medical History and Medical Care: A symposium of perspectives, Arranged by the Nuffield Provincial Hospitals Trust and the Josiah Macy Jr Foundation, London: Oxford University Press, 1971. 3-18.

McKeown, T. and R.G. Record. "Reasons for the Decline of Mortality in England and Wales During the Nineteenth Century," in M.W. Flinn and T.C. Smout, eds., Essays in Social History. Oxford: Clarendon Press, 1974. 218-250.

McLaren, Angus. ""Keep Your Seats and Face Facts": Western Canadian Women's Discussion of Birth Control in the 1920's," Canadian Bulletin of Medical Health, 1991, 8: 189-201.

Meilicke, Carl A. and Janet L. Storch. "Introduction: An Historical Framework," in Carl A. Meilicke and Janet L. Storch, eds., Perspectives on Canadian Health and Social Services Policy: History and Emerging Trends. Ann Arbour, Michigan: Health Administration Press, 1980. 1-18.

Mitchinson, Wendy. "Canadian Medical History: Diagnosis and Prognosis," Acadiensis, Autumn 1982, 12(1): 125-135.

Mitchinson, Wendy. "Causes of Disease in Women: The Case of Late 19th Century English Canada," in Charles G. Roland, ed., Health, Disease and Medicine: Essays in Canadian History. Proceedings of the First Hannah Conference on the History of Medicine, McMaster University, June 3-5, 1982. 381-396.

Mitchinson, Wendy. "The Health of Medical History," Acadiensis, Autumn 1990, 20(1): 253-264.

Oddy, D.J. "Food, drink and nutrition," in F.M.L. Thompson, ed., The Cambridge Social History of Britain, 1750-1950, vol. 2, People and their Environment. Cambridge: Cambridge University Press, 1990. 251-278.

Phillips, S. "A review of mortality statistics during the last half century," Clinical Journal, 1908, 30: 55-61, 73-80.

Price, R. "Hydropathy in England, 1849-70," Medical History, 1981, 25: 269-80.

Pryke, K.G. "The 1871 Census for the Dead: An Overview," Paper presented at the Conference on the Use of Census Manuscripts for Historical Research, March 4-7, 1993, University of Guelph, Guelph, Ontario.

Roland, Charles G. "The Early Years of Antiseptic Surgery in Canada," in S.E.D. Shortt, ed., Medicine in Canadian Society: Historical Perspectives. Montreal: McGill-Queen's University Press, 1981. 237-254.

Rosen, George. "Historical Trends and Future Prospects in Public Health," in Gordon McLachlan and Thomas McKeown, eds., Medical History and Medical Care: A symposium of perspectives, Arranged by the Nuffield Provincial Hospitals Trust and the Josiah Macy Jr Foundation, London: Oxford University Press, 1971. 59-84.

Siegel, Linda S. "Child Health and Development in English Canada, 1790-1850," in Charles G. Roland, ed., Health, Disease and Medicine: Essays in Canadian History. Proceedings of the First Hannah Conference on the History of Medicine, McMaster University, June 3-5, 1982., 360-380.

Smith, Michael. "Condemnation and Cooptation: The Erosion and Decline of the Health Reform Movement in Victorian Eastern North America," Paper presented to the Learned Society Conference, Ottawa, June -1-3, 1993.

Sutherland, Neil. ""To Create a Strong and Healthy Race": School Children in the Public Health Movement, 1880-1914," in S.E.D. Shortt, ed., Medicine in Canadian Society: Historical Perspectives. Montreal: McGill-Queen's University Press, 1981. 361-394.

Szreter, S. "The Importance of Social Intervention in Britain's Mortality Decline, c.1850-1914: A Re-interpretation of the Role of Public Health," Social History of Medicine, 1988, 1: 1-37.

Thomas, R.W. "Introduction: Issues in Spatial Epidemiology," in R.W. Thomas, ed., Spatial Epidemiology. London: Pion Limited, 1990. 1-14.

Tower, Bernard. "The Impact of Darwin's Origin of Species om Medicine and Biology," in F.N.L Poynter, ed., Medicine and Science in the 1860s, Proceedings of the Sixth British Congress on the History of Medicine, University of Sussex, 6-9 September, 1967. London: Wellcome Institute of the History of Medicine, 1968. 45-56.

Zelinsky, Wilbur. "Unearthly Delights: Cemetery Names and the Map of the Changing American Afterworld," in David Lowenthal and Martyn J. Bowden, eds. Geographies of the Mind: Essays in Historical Geography New York: Oxford University Press, 1976. 171-195.

III. PRIMARY DOCUMENTS

Canada, British North America Act, 1867, Sections 91 and 92. Ottawa: Queen's Printer, 1867.

Canada, Census of the Dominion of Canada for the year 1871. Volumes I and II; Tables I, V, VI, VII, XIII, XIV, XV, XVI, XVII, and XVIII. Ottawa: Queen's Printer, 1871.

Canada, Census of 1871, District No. 1, Essex, Province of Ontario, Dominion of Canada. (Manuscript). Schedule Two--Nominal Return of Deaths, microfilm # 9888, 9889, and 9890. Ottawa: Queen's Printer, 1871.

Canada, Census of 1871, District No. 19, Welland, Province of Ontario, Dominion of Canada. (Manuscript). Schedule Two--Nominal Return of Deaths, microfilm # 9919, and 9920. Ottawa: Queen's Printer, 1871.

Canada, Census of 1871, District No. 24, Hamilton, Province of Ontario, Dominion of Canada. (Manuscript). Schedule Two--Nominal Return of Deaths, microfilm # 9926, 9927, and 9928. Ottawa: Queen's Printer, 1871.

Canada, Census of 1871, District No. 27, Bruce (South), Province of Ontario, Dominion of Canada. (Manuscript). Schedule Two--Nominal Return of Deaths, microfilm # 9933, 9934, 9935, and 9936. Ottawa: Queen's Printer, 1871.

Canada, Census of 1871, District No. 32, Waterloo (North), Province of Ontario, Dominion of Canada. (Manuscript). Schedule Two--Nominal Return of Deaths, microfilm # 9943, 9944, and 9945. Ottawa: Queen's Printer, 1871.

Canada, Census of 1871, District No. 42, Simcoe (North), Province of Ontario, Dominion of Canada. (Manuscript). Schedule Two--Nominal Return of Deaths, microfilm # 9962, 9963, and 9964. Ottawa: Queen's Printer, 1871.

Canada, Climate Information Branch, Environment Canada, 1872 Data from Weather Stations #6137735, 6149625, 6122845, 6158350, and 6139520. Downsview: Environment Canada, 1994.

Canada, Department of Agriculture, "Report of the Minister of Agriculture of the Dominion of Canada for the calendar year 1871," Sessional Papers of the Government of Canada. Ottawa: Queen's Printer, 1872.

Canada, Department of Inland Revenue, "Report, Returns, and Statistics of the Inland Revenues of the Dominion of Canada for the fiscal year ending 30th June, 1871," Sessional Papers of the Government of Canada. Ottawa: Queen's Printer, 1872.

Canada, Department of Marine and Fisheries, "Annual Report of the Department of Marine and Fisheries for the year ending 30th June, 1871," Sessional Papers of the Government of Canada. Ottawa: Queen's Printer, 1872.

Province of Ontario, "Annual Report of the Commissioner of Agriculture and Public Works for the Province of Ontario, on Immigration, for the year 1871," Ontario Provincial Government Documents--Sessional Papers, 1871-2. Toronto: Queen's Printer, 1871.

Province of Ontario, "First Annual Report of the Provincial Board of Health of Ontario being for the year 1882." Toronto: Queen's Printer, 1882.

United States of America, Ninth Census of the United States, (Manuscript) Schedule 2--Persons who Died during the Year ending 1st June, 1870 in the County of Wayne. Washington: Government Printing Office, 1870.

United States of America, Ninth Census of the United States - Statistics of Population. Washington: Government Printing Office, 1872.

Watson, Thomas, M.D. Lectures on the Principles and Practice of Physic. Philadelphia: Blanchard and Lea, 1851.

VITA AUCTORIS

NAME:	Kathleen Amanda Lillian Smith
PLACE OF BIRTH:	Windsor, Ontario
YEAR OF BIRTH:	1968
EDUCATION:	North Collegiate Institute, Barrie, Ontario 1982-1983
	Lawrence Park Collegiate Institute, Toronto, Ontario 1983-1987
	University of Windsor, Windsor, Ontario 1987-1991 honours B.A.
	University of Windsor, Windsor, Ontario 1991-1994 M.A., Certificate in Public Administration