

A HEALTHY AND SALUBRIOUS PLACE: PUBLIC HEALTH AND CITY FORM

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Submitted to the Department of Architecture
in Partial Fulfillment of the Requirements for the
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ABSTRACT

As cities grew larger and more complex at the end of the eighteenth century, they suffered new and more pressing public health problems. The responses to these problems had, in time, an effect on the environment that produced them. This thesis is an examination of the relationship between public health reforms and the urban environment. Public health reforms were stimulated by the perceived deterioration of health in the city. The nature of public health responses designed to cope with this problem was determined, in part, by medical theory, social reform movements, and the physical environment. This thesis examines the nature of these relationships, and their effect on the form of cities in America from the colonial period to the first decades of this century.

Chapter one is an explanation of general problems created by the growth of cities and the consequent attempts to formulate a theory of city form. It is a general discussion of where public health ideas belong in this complex process. The subsequent chapters examine the influence of public health theory and practice on the urban environment in three different time periods. The last chapter shows how another change in public health theory resulted in the uncoupling of broad-based health concerns from urban designs, a characteristic of the twentieth century until recent years.

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INTRODUCTION

The plight of the city--its future and its potential--is again on the social agenda. Dissatisfied with cities as they exist, we wonder how they can be made better places to live and work. How can they be made more beautiful, cleaner and healthier places? How can they be built to encourage friendliness or neighborliness?

Despite the timeless quality, such questions are relatively new in historical terms. It is only within relatively recent history that the city has become a "problem". These issues first surfaced in the wake of the Industrial Revolution as cities grew at unprecedented rates. The increase in the complexity and size of cities from that period to the present transformed them from nascent realities to objects of study and analysis. This is a process that still occupies us today. The problems that have emerged are not yet completely understood, nor the are solutions immediately apparent.

As the urban problem received one social definition or another, various solutions were proposed. The city as an unhealthy place is but one such definition of the problem -- although one that has had an enduring influence. By this characterization improving the city required eliminating the disease-causing influences in its. The definition of "disease causing influences" changed as medical theories

changed and so did the importance of preoccupations about health changed with them. This thesis is about how these changing medical theories affected urban form by affecting the responses to the evils of the city environment.

Using health concerns as the point of departure for an analysis of city form has rarely been attempted. Historians of medicine or public health have traditionally focused their attention on the development of the discipline, or the efficacy of treatment or reform. The effect on city form, if it is noted, is given only secondary importance. Urban historians, on the other hand, including those writing from an architectural or planning perspective, note the effect of public health measures on city form, but tend to slight the importance of the theoretical basis of those reforms.

From earliest colonial settlements to the metropolis of the twentieth century, American cities have responded to the threat of disease. In the early period the response to disease was crisis-oriented, with little attention paid to health practices during periods of relative well-being. With the more settled conditions of the eighteenth century, considerations for public health were more common but dealt only with the most obvious health nuisances within the city. Despite its meagerness in comparison to the full flowering of sanitary reform in the next century, this nuisance abatement was important for the precedent it established.

Operating with a strictly defined social order but lacking a well-defined theory of disease, eighteenth century practitioners ended by focusing on personal rather than public hygiene. It is not until the nineteenth century that public health practice became firmly rooted and could exert a significant influence. It was an influence that was only possible because it combined the efforts of health and social reformers. Stimulated by the worsening health status of city residents, medical practitioners, endeavored to develop an understanding of the nature of disease. Social reformers, responding to the disruptions of the previously stable social order, struggled to explain the city's growing poverty, disease and misery. By the second half of the nineteenth century, they had together forged a powerful tool that focused on environmental control. The physical environment of the city became identified as the source of both physical and social ills. Indeed, the two were inseparable. From the power of symbiotic relationship between sanitary and social reform, sweeping programs were proposed and enacted.

Chapter one of this thesis is an examination of the general problems created by the growth of cities and the consequent attempts to formulate a theory of city form. It is a general discussion of where public health ideas belong in this complex process. The subsequent three chapters

examine the influence of public health theory and practice on the urban environment in three different time periods.

The last chapter shows how yet another change in public health theory resulted in the uncoupling of broad-based health concerns from urban design, a characteristic of the twentieth century until recent years. In the first few decades of the twentieth century, medical theory abruptly changed. The importance of the physical environment as a source of disease was denied by practitioners of the "New Public Health". The city itself was no longer an unhealthy place but simply harbored unhealthy people. Alterations in the physical environment were no longer health concerns, and were ignored by public health practitioners. Public health and social reform diverged the influence of sanitary science on urban form diminished. Yet the image of the city created by nineteenth century reformers -- both in fact and fancy -- has persisted in popular culture. We continue to cherish the notion of the city as a health place, and today a new environmentalism may well be forthcoming. Perhaps the past will be some guide to the future.

CHAPTER I: THE CITY AS A PROBLEM

The City is not a modern invention. But it certainly has a modern form. While ancient and modern cities have certain commonalities, they are also radically different. Early cities had an existence and form that was both accepted and understood by their inhabitants. That form, derived from tradition and slow evolution, had an implicit structure. Cities changed relatively little over time so that for any particular generation the city appeared static--fixed in both time and space (1).

Not until the end of the 18th century, with its dramatic changes in the economic and social fabric of society, did cities become increasingly problematic (2). The changes that occurred during this period have been well-documented: decreasing mortality caused rapid changes in the population age structure; population changes produced shifts in the rural/city balance; technological advances resulted in dramatic increases in productive capacity, accompanied by significant changes in the organization of labor; while formerly stable social and political mechanisms experienced major upheavals (3). The "static" environment no longer existed. The city had become a problem, and the focus of attention.

Along with these developments came attempts to formulate an explicit analysis of urban life. These

theories of city form per se are of two major types: normative theories and analytical theories (5). These two types of theories address fundamentally different issues.

Analytical theories, by and large, are concerned with the "how" and "why" of city form. How did a city develop a particular structure? How does that structure function or work? Whose interests are served? They attempt to explicate urban forms, typically with reference to non-formal structures--social structures, culture, or economics. Their strength lies in their ability to explain the development and evolution of city forms, and the social relationships that take place there. Their ability to explain--or predict-- physical form is limited (4).

There is a fairly substantial sociological literature on the city that largely falls within the realm of analytical theory. Social relationships are the focus of sociological inquiry, and the physical environment has been seen as important only insofar as it is perceived to affect these relationships. Classic sociological works on the city (5) relate to the physical environment primarily as a setting for social relationships. Park's classic work on the city illustrates the sociological approach:

The city is...something more than a congeries of individual men and of social conveniences--streets, buildings, electric lights, tramways, and telephones, etc.; something more also than a mere constellation of institutions and

administrative devices...The city is, rather, a state of mind, a body of customs, and traditions, and of the organized attitudes and sentiments that inhere in these customs and are transmitted with this tradition.(6)

Simmel, in another classic work on the city, also gives secondary importance to the physical environment:

Space as much is in the last analysis a subjective mental category, a form of coordinating discrete sense impressions in a unitary perception. It is a synthesis which results from a specific psychological function, and which, as such, has no immediate sociological significance. What appears as objective space is, as such, merely an irrelevant form.

But what is in reality a mere formal condition without which certain occurrences cannot take place has often been taken for an efficient cause. Certain interpretations of history have laid much stress on the spatial factor and have regarded the size of states, the dispersion or concentration of peoples, the mobility or stability of the masses, as if these factors were efficient causes emanating from space instead of mere expressions in a spatial form of the actual forces and processes. What makes a state big is not the number of square miles of its area, but, the forces and resources of its people. What creates the characteristic phenomena of neighborliness or strangeness is not the spatial proximity or the spatial distance, but a specific psychological content. Notwithstanding this fact, the spatial form of objects and occurrences are often of great importance, not as causes, but as effects that throw light on the character of the actual forces. [emphasis added](7)

Normative theories, in contrast, focus on the question of the "good" city. What is the good city? How do we know

it? What are its salient features? How can it be produced? Reproduced? Frequently, normative theories are not explicitly stated. Strong traditional imperatives may determine city form. These traditions may be reformulated into an explicit theory of city form, but most often they exist as custom, habit, or folk planning.

Within that class of theory defined as normative, three additional sub-types may be identified. These are theories based on cosmic models, on organic models, and on machine models. Each defines the parameters of the "good" city. Oddly enough, although these models do not explain the origins and development of the city, they have greater predictive power, in terms of form, than the non-normative theories.

To a greater extent than the alternative approach, normative theories are concerned with the physical environment. The physical form of the environment provides a critical setting which permits the social activity of the society to occur. In contrast to Simmel's approach, spatial relationships are perceived as causes. Physical forms are perceived to have real effects on the nature of social relationships (8).

Of course any discussion of theories of city form must ultimately deal with the question of whether or not a general theory of city form is possible. Is it possible to construct a theory that will not be limited by cultural and

historical boundaries, that will be able to explain both the past and predict the future (9)? A number of urban historians have taken an essential anti-theoretical approach: each city is unique with its own particular story, explaining both its physical form and its social relationships (10). At the other extreme, are those who suggest that it is possible to construct a theory that is equally applicable to all cities. Typically these are normative theories, where it is held that it is indeed possible to know the "good city". Given knowledge of the "good" city, it is then possible (if not always desirable) to produce it over time and across cultures. There is yet a third position, lying somewhere between the other two. This maintains that each city's development is, indeed, unique, but that there are certain historical processes that are common to all cities. These common historical experiences are transformed through the unique character of individual places, resulting in forms that are at once general and specific. The approach taken in this thesis emphasizes the interaction between physical and social forms. Neither social nor spatial forms are viewed in terms of cause and effect; rather they are seen as interactive. Each is both cause and effect. Physical and social forms are distinct, but inseparable. Normative ideas of city form--especially popular ideas about the "good" city--are a critical

component of the historical process that shapes a city, and thus they must be considered even when the analysis is essential analytical. What is being suggested than, is a normative approach to analytical theory.

The interaction between analytical and normative approaches to city form becomes critical when the role of public health is considered. By and large, public health problems are urban problems (11). Analytical theories may well be able to tell us a good deal about the "how and why" cities developed in such a way as to produce a variety of public health ills (12). However, it is from normative theory that we gain an understanding of the responses to these threats to health. The ideal or "good" city is likely to be defined in ways that will eliminate threats to health in one way or another. The "good" city is the "healthy city"--especially in the 19th century (13).

It is perhaps a bit misleading to talk about theories of city form as though they were tangible objects, open to examination, and shared equally by all city inhabitants. More than likely, particularly in the case of normative theories, they are unconsciously held--a part of popular culture and ideology. Yet "theories" of city form are often implicitly embedded in citizen's perceptions of their city. Anselm Strauss makes this point in Images of the City:

Just as every American city is represented in temporal terms, it receives representation along other dimensions: spatial, geographic, economic, social, cultural. All such representations from a characteristic system of symbolism: they do not merely constitute discrete images. The whole system has historical roots, for it develops out of the contributed perspectives of various important sectors of the city's population as they have experienced the city during its past. Today's populations inevitably redefine anew, but using old symbolism. They also add, in their turn, elements of imagery to the city's total symbolism. Likewise, today's populations may stress or select certain particular images from the total set, ignoring or denigrating others--as some may wish to represent, for instance, their city as progress and disregard its slums. (14) [emphasis added]

It is important then, also to consider the images, their origins and their effects: the city as both a "state of mind" and a set of spatial relationships.

The practice and theory of public health created and sustained a new symbolic representation of the city at a critical stage in urban development. It provided metaphors and a perspective for analysis. However, unlike many other representations public health has both a theory and a practice, and through its practice it attempted to transform symbolic representations into physical forms. In contrast to utopianism public health worked through traditional social institutions: the legislatures, educational institutions, voluntary social organizations and the work place, to name a few. Laws were passed, regulations drafted, behavior and ideas changed. Thus, existing social

relationships were altered--often mediated by changes in the physical environment. Public health offered both the utopian vision of the "healthy city" and the means of achieving it. Thus, it is a logical focus of inquiry from both a sociological and architectural perspective.

Public Health and City Form

It must be emphasized that there is no claim that public health theory or practice represents, even implicitly, a theory of city form. Yet, it provides an explicit set of principles through which the good city can be recognized and realized. Moreover, as a "scientific" discipline, it can put forth a number of essentially normative statements under the mantle of "value-free" science, granting them a certain amount of legitimacy and universal appeal. But public health theory and practice run their own developmental course. The interest of the disciplines, their objectives, and language, are their own.

The same is true of theories of city form. At certain historical moments, however, the language of both harmonizes. This thesis will examine certain of these moments of resonance. The nineteenth century was one, and it is possible that we are about to embark upon another. This harmony between public health theory and practice and ideas about the city give rise to completely new ways of

thinking about the physical environment--a new mode of discourse. A main thread of the analysis attempts to understand the development of a normative theory of city form, as mediated through public health theory and practice. It is, in essence, a study of the develop of a particular aspect of the popular culture and ideology of city form. It is also concerned with the actual effect of this ideology on city form.

An overview of some of the major factors in urban development, both European and American, and the problems associated with that development will help clarify the role of public health in the shaping of urban environments.

The Emergence of the Modern City

The traditional indicators that are used to differentiate towns and cities from "non-cities" -- such as higher population density, economic complexity, more specialization and wealth--do an injustice to the rural/city relationship that existed in the pre-industrial period. These early cities were "tied to the countryside and their inhabitants were often as much concerned with the prices of corn and sheep as with the simple craft and service occupations which supplied the needs of the surrounding countryside."(15) City rhythms were, more often than not, tied to country rhythms, and the economy and social life of a city or large town could easily stop to meet the demands of a harvest time

or ploughing time. It has been said that the city "...was not an organism in itself, but rather an organ within the broader context of an urban-rural continuum". (16)

Numerous historians have noted that the first decisive changes in the transformation to the "modern" city occurred after fairly rapid changes in the population. In England, for example, the population grew steadily between the 16th and 18th centuries. Much of the economic change in the 17th century had been closely associated with, if not a direct response to, the steady increase in population. In the 18th century, for the first time death rates fell below birth rates (17). This had two important consequences. First, there was a change in the size of the population. Second, there was a change in the structure of the population, with an ever growing proportion of young people.

The changes in population structure produced problems that were more complex and far-reaching than those resulting from a simple increase in size alone. Social and economic structures shifted as well, and these shifts had a significant effect on the rural/city population balance (18). Commenting on this period historians have noted that "not only were specific customs and institutions brusquely changed or abolished, but a whole vigorous and variegated popular culture, the matrix of everyday life, was eroded and began to perish." (19)

These changes resulted in a great increase in internal migration as well, beginning in the early years of the 18th century. Country dwellers were lured to the city in hope of gaining some economic or social advantage. The lure of the city stood in sharp contrast to the hopelessness of a life in country poverty--or so it seemed. Thus, fairly large towns and cities suffered an even greater increase in population than that caused by the change in birth and death rates (20).

Simultaneously, changes in technology and productive capacity demanded discrete areas of population density where industrial production could be concentrated. Old centers of population grew, and new ones developed where labor, energy, and access to transport were available (21).

Accompanying this was a concomitant shift in the agricultural and industrial balance. Cottage industries, located in the countryside declined, and large industrial centers grew where a labor force was available or could be attracted. This further encouraged social and spatial mobility.

The growth of cities associated with these shifts produced an unprecedented set of problems. Before the mid-18th century town forms were laid out in accordance with traditional practice, and social and spatial relationships changed very slowly (22). The outlines and interrelationships of the urban system remained substantially unchanged

between 1500-1700. By the end of the 18th century, towns and cities were growing faster than the ideas about them. Modernization meant increasing change...the economic and social behavior of inhabitants, their spatial behavior and locational decisions were clearly different from what they had been in the 16th century (23).

NOTES

Chapter 1 - The City as A Problem

- (1) Benevelo, p. 7.
- (2) Reisman, among other urban sociologists and historians, claims that the change from the pre-industrial city signifies a radical break in the flow of urban history.

Tager in his analysis of the rise of the industrial city writes:

There are only superficial similarities between the new industrial cities and the cities of the past; Rome had slums and congestion, pre-industrial London had water pollution and crime. But the urban problems of a Londoner or Roman had little importance or impact on the basically agricultural societies of which they were a part. Pre-industrial cities were service areas, centers of commerce and culture, the axis for totally rural life structures. p.2.

- (3) The typology of theories of city form relies heavily on the work of Kevin Lynch, in particularly chapter 2, pp. 37 - 50. Lynch uses "functional theory" rather than "analytical" but since functional has a very specific and different meaning in other social science disciplines I have avoided using it.
- (4) Ibid.
- (5) See, for example, the works of Simmel, Park and Burgess, Sjoberg, Wirth, Weber and Reisman.
- (6) From Park's The City (1925) quoted in Strauss, p. 256.
- (7) From Simmel, Quoted in Spykman pp. 144-5. See also Simmel's "Mental Life in the Metropolis".
- (8) Lynch's work provides an excellent discussion on the various theories and models of city form. Cosmis theories provide an excellent example of the perceived effect of the physical environment.

Lynch writes:

Space and rite are stabilizers of behavior and serve to bind people together...Institutions and forms, acting in support of each other...were thought invincible in reality, so that an actual disaster could be attributed to some careless flaw that had crept into these dispositions. Behind these concepts lie certain primary values: order, stability, dominance; -- above all the negation of time, decay, death, fear, and chaos. (p. 79)

In recent years the work of environmental psychologists has also stressed the importance of the physical environment on behavior. See for example, the work of Altman or Newman.

- (9) Lynch seems to attempt a general theory of city form, although with greater sensitivity to cultural and historical parameters than this statement would suggest.
- (10) See for example, the work of Bidenbaugh, Banham, Warner, or any of the "city" histories.
- (11) There are obvious and significant exceptions. Rural health problems can be quite severe - ranging from specific diseases that are endemic in rural areas to the more general problems of sanitation or malnutrition. These problems are certainly persistent threats in many parts of the world today. Yet, by and large, the origins of the public health movement must be located in the city.
- (12) Marxist analyses are particularly insightful here. Engels descriptions of the city of Manchester have become classic. See Marx and Engels; for more contemporary perspectives, see Lefebvre or Castells. Studies of the city that focus on the city as an arena of conflict -- class, political, or racial -- might also be included here.
- (13) Richardson's Hygeia: City of Health published in 1875 is one of the most striking examples.
- (14) Strauss, p. 32.
- (15) Patten, p. 40.
- (16) Ibid.

- (17) Ibid. p. 78
- (18) Ibid. p. 50
- (19) Ibid.
- (20) Ibid. p. 228
- (21) It should be noted that there is controversy amongst economists concerning location choices of industry. Do industries locate where facilities are available? Or is it that in where areas with facilities industries naturally grow?
- (22) Benevelo writing of traditional practices notes that:
- To lay out a square, a district or a whole town was to give it a definitive and permanent architectural form, though sufficient margin was allowed to absorb, without basic alteration any foreseeable growth; in other words, it was to apply the plausible approximation of an absolutely invariable image to a very slow moving reality.
- (23) Patten, p. 296

CHAPTER II: COLONIAL AMERICA

While the immediate context within which American cities and urban centers developed appears quite different from that of their European counterparts, by the end of the 18th century they were suffering from the same problems.

From the outset they lacked the centuries old building traditions, and were for the most part laid out in the simple grid typical of colonial developments (1). For the first century or so land was plentiful, the economy rested on either trade or agriculture, and the simple grid worked well enough. Within the grid's constraints early settlers reproduced, whenever possible, traditional European village models. This was the tradition they knew and understood. For the early settlements, religious dominance was the rule, and the church occupied a central position--both socially and spatially. The town green of New England, with its Church prominently placed, is example of the strong correspondence between the physical environment and social relationships. In so far as any "theory" of city form was at work it was rooted in traditional European models.

In settling a wilderness, Americans were forced to think about the laying out of towns, but they did so with reluctance and a narrowness of vision. It has been suggested that this reticence to "plan" results from

colonial settlement patterns and land grant policies which granted unique status to the right of private ownership (2). Whatever the specific reasons, the opportunity for early comprehensive planning was lost, and a sense of urban history has never flourished in the United States. Warner wryly comments, "Americans live in one of the world's most urbanized countries, as if it were a wilderness in time and space" (3).

The early developments did seem to serve their communities well, as long as stable populations, stable social structures, and religious and cultural homogeneity prevailed. When this stability broke down, as populations grew and became increasingly mobile, and as industry developed, these traditional settlement patterns lost their coherence and failed to respond to the conditions of their own growth. Private enterprise and private ownership dominated the growing American cities. Here is Warner again on the problems associated with the growth of American cities:

...the American tradition of land management was concentraing on the rights of owners of each bit of land, [while] the city was growing into a giant system whose interactions and intercommunications spread over many miles...Tradition...proved unable to respond [to this growth] (4).

By the time this process was well underway the 19th century and its new conditions would radically transform the city.

But even prior to that public health concerns had left their mark on the face of the colonial city.

The Medical Context of the 18th Century

This is a very brief sketch of the medical and scientific context in which public health practices of the colonial and post-revolutionary period occurred. Its intent is not to provide a complete picture of medicine or public health during this period, but rather to illuminate the rationale behind early public health practice.

Medical thought through much of the 17th and 18th centuries, like that of other centuries, was dogmatic and often extremely contentious. Occult notions, speculation, and religious doctrine offered explanations on the nature of disease, existing side by side with a new interest in experimentation and measurement. Galenic and medieval traditions were slowly giving way to a new approach that focused on specific diseases rather than generic derangements of the body. In this new scheme physicians began to speak of "measles" or "smallpox" rather than "fevers" or "fluxes". But in either event, the main questions concerned what was the "underlying" or "proximate" cause of the disease. There existed a variety of answers to this question. Thus there coexisted a "chemical" approach, a mechanical view, a focus on the nervous and vascular systems, a search for pathological lesions, and a curiosity

about the possible role of the newly discovered "animalculae" all competing for the right to explain disease (5).

Yet despite the variety of medical theories, and the real scientific advances that were being made, medical practitioners could, in fact, do very little in terms of either the cure or prevention of disease. Faced with such limited resources, similar therapies were often used by advocates of very different theories. In addition to looking within the body for the cause of disease, physicians of the period also looked outside the body for remote causes of disease. During the 17th century much attention has focused on moral and astrological causes, superseded in the 18th century, by mental states, environmental factors, heredity, contagion, and infection.

It is within this context of theoretical and practical diversity that early American medicine developed. The first American treatise on general medicine was written in 1724 by Cotton Mather. Mather drew heavily from contemporary European sources for his work, a unique mixture of theology and medicine. Mather maintained that disease was ultimately caused by sin, and that prevention and cure would be attained through prayer and forgiveness. But, he also found religious justification for encouraging practical measures. Mather strongly encouraged the practice of inoculation

against smallpox - introduced in Boston in 1721 - as well as measures to improve personal and community hygiene. As the example of inoculation shows, the period was not totally without medical successes (6). Several procedures worked, even if there was no clearly understood reason. However, there were many more failures than triumphs. The reasons for this are complex, but one certainly is that any of the ideas about the cause of disease encouraged pessimism. If fevers were caused by seasonal variations, for example, what could medicine hope to do? If tuberculosis were hereditary, how, other than through eugenics could it be prevented? If diseases were not contagious, of what good was isolation? And finally, if disease were the will of God, some divine punishment for sin, the "cure" was not to be found in medical practice, but through God and prayer.

Thus, when the first colonists reached American shores, and for nearly two centuries afterwards, "medical" theory and practice was of limited help for coping with health problems. The immigrants were relatively fortunate, however. They found few dangerous indigenous diseases of Europe--plague and leprosy. Once the initial hardships were over, the colonists probably enjoyed relatively good health given the standards of the day (7). Overall, the major causes of death, after the very early years of settlement, were respiratory and intestinal infections, malaria, and consumption. Yet it was the epidemic diseases--especially

smallpox and yellow fever--that were most feared. Endemic diseases were taken for granted--a natural event to which people were resigned. Epidemics, on the other hand, were "unnatural" and evoked strong community responses. These responses were most often improved sanitation efforts, isolation of victims, and occasionally, mass flight from the scene of the epidemic. Although isolation and evacuation represented one view of disease (contagionist), and sanitary measures another (anti-contagionist) both were likely to be practiced during an epidemic. Crises were marvellous reconcilers of contradictions (8).

The dominant strain, then, in medical and public health practice was a pragmatism that transcended many systems and doctrines. That this was so did not make the results any less permanent or significant. To see what these effects were we must take a detailed look at the nascent cities of the New World and their public health problems.

Public Health in the Colonies

Life in the colonies presented a harsh reality to the early settlers. Weakened by a long sea journey they arrived in a hostile environment where changes in diet, a new climate, different sources of water, and crude provisions for shelter took their toll. The necessity of establishing a new social order added to the rigors of the physical environment. Public health in the very earliest of colonial

settlements was primarily concerned with the most basic issues of survival: the provision of shelter, the acquisition of food, and the establishment of social boundaries (9).

Still the early settlers hoped to find a healthy environment in the New World and brought with them a number of ideas on how to achieve that end. Possibly the most important public health idea in early settlement patterns was the avoidance of low marshlands. "Bad air", "miasmas", noxious odors, or being exposed to the products of putrefaction of animal and vegetable matter were all seen as potentially dangerous, and towns were laid out, insofar as possible to avoid these influences. Sometimes these requirements were not met until disease forced them upon the town fathers. The city of Charleston, South Carolina, for example, was built on low, wet lands. In 1666 town officials boasted that Charleston was most healthy [in spite of its location] "even at that time of year when it is sickly in Virginia"(10). Only twenty years later the city was so plagued by disease that it was actually moved across the harbor to what was believed a healthier environment (11).

The typical rural isolation of many settlers offered some protection against the spread of diseases. This was particularly true of the more inland settlements. The distance between settlements, and the infrequency of travel between them, meant that an epidemic could quickly burn

itself out in a colonial town. (By contrast, the same disease might well remain endemic in a similar English community.) (12)

With the development of seaport colonies into busy commercial centers, new public health problems arose. In contrast to other, more isolated, settlements seaports were almost always sources of infection. Disease carried from Europe would spread via the native population to the more inland towns. As the size of the towns increased, and the distance between them decreased, they became sites of endemic disease.

As a practical matter, the chief preventive measures against disease in the Colonies were directly copied from European traditions. These included isolation; disinfection, through burning and fumigation; and nuisance abatement. Of these, nuisance abatement probably had the most direct and long-term effect on city form in that it alone focused on spatial relationships and the built environment.

Nuisance Abatement

While the origins of disease were poorly understood during the colonial period, there was a widespread belief that disease was spread through a "corruption" of the atmosphere. In this, public health theory followed a path laid

down centuries earlier. Thus the Regimen Sanitatis Salernitanum, dating from the twelfth century averred:

Though all ill savours do not breed infection
 Yet sure infection commeth most by smelling
 Who smelleth still perfumed, his complexion
 Is not perfumed by Poet Martia is telling;

Yet for your lodging rooms give this direction,
 In houses where you mind your dwelling;
 That near the same there be no evil scents
 Of puddle-waters or excrements;
 Let aire be cleare and light, and free from faults,
 That come of secret passages and vaults (13).

Early Massachusetts settlers were largely in agreement with this advice. Between 1630 and 1690 the Town of Boston passed a number of ordinances to insure that its "aire be clean and light". In 1634 the town fathers ordered:

No person shall leave any fish or garbage near the said bridge or common landing place between the two Creeks whereby any annoyance may come to people that pass that way, upon pain to forfeit for every such offense five shillings (14).

By 1653 the town had passed a number of similar ordinances prohibiting the throwing of "any intralls of beast or fowles or garbage, or carion, or dead dogs or cats, or any other such stinking thing in any highway or ditch or common within this neck of land of Boston."(15) The mere number of regulations passed concerning the dumping of garbage indicates that this must have been both a widespread and troublesome practice.

Recognition of the potential threat to health posed by decaying organic matter also led to a number of regulations concerning the placement of privies. They were not to be closer than twenty feet to a neighboring house or highway unless combined with a six foot vault. Those early regulations concerning the placement of privies and the disposal of human wastes were to extend their influence well into the nineteenth century. It has even been suggested that the problem even determined the fundamental unit of urban structure, the city lot: "The deep backyards so common in cities partly reflected the necessity of discharging wastes to the rear of the building and coping with the results." (16)

Nuisances, frequently defined in terms of decaying organic matter, were no mere matter of esthetics or comfort. While their presence announced itself by their noxious odors, nuisances were seen as threats to health, fouling water and soil. They were potentially life threatening. The combination of decaying matter and wet soil was particularly unhealthful, and persons of means avoided whenever possible, the low-lying areas where such combinations were likely.

Many nuisance ordinances were focused on specific trades and activities. The regulations noted the potential danger to health from these activities, but did not seek to eliminate the activities, merely to isolate them. That is, they were concerned with the spatial location of noxious

activities, but not with their existence. The physical environment of the town was not viewed comprehensively, but rather in terms of discrete units. Thus, moving noxious activities was seen as a viable solution to the problems presented--out of sight (or more accurately, out of smell!) meant out of mind. This emphasis on spatial location would have implications for subsequent development.

Butchers, for example, were among the first and most vigorously regulated of the early trades (17). The obvious organic wastes produced by butchering were seen to present a serious health hazard, and so, laws regulating this activity appeared as early as 1684 in Boston. In 1692 one of the first measures of a new Charter was to pass a more stringent act requiring the Selectmen of Boston, Salem, and Charlestown and all other market towns with two Justices of the Peace to assign places where butchers, distillers, changlers, and carriers could carry out their trade with the least offense to others (18). These regulations are an early, but explicit attempt to segregate commercial and residential use within the city. This segregation did not come "naturally" but as a result of regulations designed to protect health. For slaughter houses, several wharves were selected in the hopes that the tide would carry ofal out to sea. By 1710, butchers were again becoming "very Noysome and Offensive to Inhabitants" and the Court decided that the

original assigned places were no longer appropriate due to the town's growth. Permits were revoked, butchers relocated, and the recalcitrant were vigorously persued by the courts (19).

These attempts at regulation follow directly from European precedents, where regulation of noxious trades had occurred for some time. While these ordinances did not threaten traditional town/city land use patterns, but grew out of the European tradition, they are significant in the development of American cities in that they are among the very first attempts to regulate private property use through secular authority.

Nuisance abatement aside, environmental sanitation largely remained an individual matter during most of the colonial period, with groups of neighbors often dealing with problems cooperatively. The town selectmen often permitted groups of neighbors to join together to build common sewers to carry stagnant water and decaying matter away from homes or to construct large common wells. These groups were also permitted to prohibit non-members from using their facilities (20).

These early cooperative efforts also posed a number of immediate problems. Here, as in the nuisance regulations, there was an emphasis on spatial location, rather than on the underlying problem. These early sewers simply carried wastes from individual basements to the somewhat removed

shoreline, where they became someone else's problem. In addition, these private attempts to deal with wastes often created an additional, unanticipated consequence. Uncoordinated, and often built to uncertain standards, they themselves often created a nuisance, becoming clogged and overflowing, spreading wastes along their route. In addition, they were in constant need of repair and construction. Residents were constantly tearing up the streets to install or repair private water systems, and so, in 1709, permission for digging up the street had to be granted by the Selectmen, and all sewers and wells had to be constructed of stone or brick (21). Permission was often granted routinely, however, and an extremely complicated system of wells and drains developed. These became a source of trouble as the town grew and as repairs and changes became more and more necessary. This problem was eventually solved by municipal control of the water and sewer system in the following century.

Perhaps the greatest effect of these early cooperative ventures was to demonstrate their feasibility. Groups of individuals, cooperatively, altered the public spaces in the urban environment to protect their own health. This laid the foundation for later municipal ordinances and services to protect the public health.

Often public health considerations reinforced other interests to bring about change. Both health and commerce

required an urban setting where streets were clean and clear, in the first instance to prevent disease, in the second to facilitate trade-related traffic. This combination encouraged the development of wider streets that were often paved. The specific health concerns were often related to the fear of epidemic disease. Devastating scourges of yellow fever, smallpox and other maladies were thought to be the result of miasmas produced by accumulations of decaying organic matter which often littered the streets. Provision of easily cleanable (i.e., wide and paved) streets was often mentioned as a specific preventative (22).

Even in the South, where climate presented a different set of health concerns, street paving was frequently mentioned as an aid to health maintenance:

Whether paving the streets of Charleston would conduce to the health of the inhabitants has been doubted by many. It might add to the heat of the air [often believed to be of itself a health problem, particularly for Englishmen not accustomed to extremes of temperature], but it would definitely lessen its morbid qualities, by repressing exhalations...it is probable that the inhabitants would be gainers on balancing the advantages against the disadvantages from paving the streets of the city (23).

Considerable energy was put into the paving and naming of streets. In Boston in 1708, for the first time, street

boundaries were fixed and recorded. With this new population density, fires became an increasingly significant threat to life. Since 1653 every household in Boston had been required to be equipped with a ladder and pole for putting out roof fires. After the great Boston fire of 1747 all new construction in Town was required to be of brick. This had a profound impact on the city's appearance (24).

The fear of epidemic disease also led to other requirements in city development. Towns often constructed pesthouses on city islands or town outskirts so as to isolate those suspected of being disease carriers or those actually stricken with disease. And so: "...a motion was offered in a town meeting to erect a pesthouse in some remote location...After some controversy of the site, the Province built the hospital in 1717 on Spectacle Island,"(25) for the purpose of quarantine. Strict regulations also applied to incoming ships and their cargo, both human and commercial. By 1720 Boston had a quarantine system backed by law, and regularly enforced it. Fear of disease and contagion contributed to the routine placement of hospitals outside city limits.

In addressing the issue of hospital location, isolation was the critical variable. Here, as in the early attempts to regulate noxious trades, removal to an isolated site was deemed a necessary and sufficient solution to the public health menace that was perceived.

Increased government activity during this period resulted in more careful record-keeping, a rise in the number of officials (significantly, the Overseers of the Poor, assessors and inspectors), the passage of new laws and the consolidation and publication of the Town's by-laws. This development of bureaucratic mechanisms facilitated later sanitary reforms (26).

In this development we can see the beginnings of an increased social complexity and interdependence. Traditional social mores were less powerful, and were supported by a growing secular organizational system.

The early experimentation with public regulation and supply of essential service is more significant for its public policy implications than immediate results. In terms of city form it is important for the perceived authority of local government to pass legislation and enforce regulations which restrict the development and private control of a city. These regulations were most frequently passed in the name of public health and safety. Certainly building codes, property standards and municipal services still are justified in health and safety terms. This is one of the principal ways that public health legislation and regulation, grounded in medical theory and popular culture, helped to shape cities.

In this context, Benevolo notes that "...minor sanitary defects...depending on a large number of factors and neces-

sitating special legislation...soon spread from sanitation to the field of town planning in general" (27).

From 1720 through the time of the Revolution, colonial cities and towns continued to make small advances in the area of public health with further attempts to regulate sanitation, to provide clean water, and to isolate disease. It is not until the nineteenth century, however, that qualitatively new approaches were tried. The decades just after the Revolution stand as a link to past practices and a prologue to future ones.

The Developing Country: Years After the Revolution

The years following the revolution were marked by accelerated urban growth and prosperity. Health, and in particular public health began to take on a new importance in the developing country. The "Ode to Health", published in the "Massachusetts Magazine" captures the spirit of the time, and provides a sharp contrast to the grim Puritanism of the early colonial days.

Blest Hygiea! Heavenly Power!
 Hear oh hear thy votary's call,
 First of all Blessings, all in all!
 Grown with health each circling hour.
 What are riches? Idle toys;
 Gold it gives no real joys;
 Silver, diamonds, hoards of wealth;
 Less than nothing, without health (28).

In spite of its optimism, the emerging country was faced with serious public health problems. The problems of sanitation continued to vex the city and the related problems of noxious trades, and the provision of a pure water supply were major public health issues. Filth, odors, and water of questionable quality were an assault on the population's senses, and were believed to cause and spread disease. Epidemic diseases increased in intensity, and were an additional focus of public health concern.

Prevention, rather than cure, seemed to provide the most helpful approach, and physicians, laypeople, and reformers all turned their energies to this task. The war experience seemed to provide some guidance in the area of disease prevention, and the advice of John Pringle, a military sanitarian was typical:

From the point of view of the causes of malignant fevers and fluxes, it is easy to see how incident they must be, not only to all marshy countries after the hot seasons, but to all populous cities, low and ill-aired; unprovided with common sewers; or where the streets are narrow and foul, or the houses dirty; where fresh water is scarce; where jails and hospitals are crowded and not ventilated, or kept clean; when in sickly times the burials are within walls and the bodies are not laid deep; when slaughter houses are likewise kept within walls; or when dead animals and offals are left to rot in kennels, or on dunghills; when drains are not provided to carry off any large body of stagnating water in the neighborhood; when fleshmeats make the greatest part of the diet, with a mixture of bread, grains, greens, wine or other fermented liquors; when the grain is old and moldy, or

has been damaged by a wet season; or when the fibers of the body are relaxed by immoderate warm bathing. I say, in proportion to the number of these or the like causes concurring, a city will be more or less subject to the pestilential diseases, or to receive the leaven of a true plague when brought to it by any merchandise (29).

Pringle's observations tell us much about the living conditions in the city, the concerns of the populace and the likely avenues of correction.

The war years had focused American attention on some new public health problems. War casualties led to a renewed concern over the health implications of urban burial grounds. Animal putrefaction was still considered to be a major cause of disease, and during the way improperly interred bodies both in the city and on the battlefield were considered a source of infection and disease. In a popular medical book from the 1780's it was written:

Whatever gave rise to the custom of [urban burials] it is a bad one. It is habit alone which reconciles us to these things; by means of which the most ridiculous, nay pernicious customs, often become sacred. Certain it is that thousands of putrid carcasses so near the surface of the earth, in a place where the air is confined cannot fail to taint it, and that such air, when breathed into the lungs, must occasion disease (30).

This opinion was widely held, and in 1795 the Common and Chapel burying grounds in the Town of Boston were closed on the advice of physicians. It was believed that the health

of "the Inhabitants is in danger from the crowded state of these grounds and the exhalations that must frequently arise from the opening of Graves therein."(31) Over the next three decades, these public health concerns would culminate in the opening of garden cemeteries, outside city limits.

The harmful exhalations given off by the dead were compounded by the habits of the living. Street cleaning and nuisance removal remained major concerns in the city. Despite renewed legislative attempts to control wastes, the streets of the city remained filthy. They often contained pits of stagnant water described as "noxious, putrid, and offensive...the effluvia from such a source is highly injurious." The streets of Boston were "a disgrace to everyone."(32)

The evils of dirty streets resulted from the fact that they polluted the air, thus causing disease:

In great cities so many things tend to pollute the air, that it is no wonder it proves so fatal to the inhabitants. The air in cities is not only breathed repeatedly over, but it is likewise loaded with sulphur, smoke, and other exhalations, besides the vapours continually arising from the innumerable putrid substances such as dunghills, slaughterhouses, etc. All probable care should be taken to keep the streets of large towns open and wide, that the air may have a free current throughout. They ought likewise be kept very clean. Nothing tends more to pollute and contaminate the air of a city than dirty streets (33).

Numerous attempts to improve the condition of the streets were made. Paving the streets as an aid to sanitation was inspired by these public health concerns. This had a dramatic effect in appearance, and in giving the city permanence and a fixed set of boundaries that dirt roads could not. Paving streets created a new set of problems, which in turn, also influenced city form. By decreasing the ability of streets to absorb water from rain and other sources, runoff water on paved streets became a new urban problem. We can see in the advice above a new voice for public health: one that not only tells us what must be forbidden, but what should be.

Providing a safe and pure water supply became a major issue by the end of the 18th century. In 1795 the Boston Aqueduct Corporation was chartered to provide the city with piped water from Jamaica Pond. Pine logs were drilled for pipes, and by 1798 an aqueduct ran from the Pond to the center of town. Rates for piped water ranged from 8-12 dollars a year; individuals could also buy piped water by the barrel from a local distributor. Boston was the first American city with an aqueduct, and was widely praised for the project. Local newspapers commented:

[The most important benefit of Aqueduct water is to increase] the means to preserve HEALTH. ...Well water continually grows worse in cities, by the constant accumulation of matter which soaks into the earth. Hence, it is that all well water in old cities becomes extremely

unhealthful and thereby greatly increases the bills of mortality...To have it pure and plentiful in great cities, by every way of increasing the means of cleanliness, as well as by rendering the system of nutrition more healthful, must be of the highest consequence to prevent putrid and other pestilential fevers, and other fatal diseases (34).

Although undertaken by a private corporation, this was a major "public works" project for the period, and a source of civic pride.

Fear of yellow fever and other fevers created a source of almost constant agitation over the sanitary condition of the city. A disciple of John Howard, the British philanthropist and reformer, wrote the following of the city:

Admonishing men of wealth to take stock of their good fortune he reminded them of the less fortunate: To know what many suffer, it is only necessary in a sultry day to walk through Fitch's alley, Wilson's Lane, Exchange Lane--through Fore Street as far as Winnesmet Ferry, White Bread Alley, and many other crevices, almost debarred from free air and the light of heaven--and then ask yourself this sober question--How could I live in such a place as this, where the comfort of a refreshing breeze can never come--how can these miserable people bear the stench and filth--what if I should be reduced to the sad necessity of leaving my pleasant, airy and elegant habitation, and condemned to live where I can scarcely see to read--and then if such a fever should come as almost depopulated Philadelphia, or such sickness and fires that have desolated Charlestown, what hope of life or property could remain? Why should not those blessings of which all ought to be partakers and which it is in our power to dispense, why should they not be more equally difused to all parts of the town, and the benefits of free air and green and shady walks

be enjoyed as easily and cheap by one as another? (35)

The voice of the reformer, the call to equalize the benefits of the city, and to reduce some of the risks rings out clearly in this passage. It is a sentiment that will be repeated again and again, and which will take on increasing force as urban conditions become more problematic.

In 1798, despite years of agitation for sanitary reform, Boston was struck by an epidemic of yellow fever. Hundreds died in the summer of 1798, while thousands of others, in a desperate measure, fled the city, to return after frost had settled, and the disease was checked. Inspired by fear, and the belief that the disease was the result of accumulations of filth, the Town of Boston, in December of 1798, authorized a Board of Health, which was installed in February, 1799 (36). The establishment of a Board of Health marks a turning point in the history of public health in Boston. From this point on there was an official body authorized to act on behalf of the city's health. A new era, marked by an increasingly vigorous and systematic reform movement was about to begin. It is during the 19th century that the public health/city form relationship is to become most powerful.

The Early Period: Conclusions

Despite the rather piece-meal application of public health measures during this early period of development, it is an important era in terms of subsequent reforms and city planning. Public health measures during this early period were most frequently concerned with spatial relationships, though often not in a clearly articulated way. The object of early nuisance abatement, for example, was removal of potentially disease-causing organic matter and noxious odors. There are a number of possible solutions to this problem, but it is significant that early public health leaders fought for spatial isolation of the offenders. Activities that had been diffusely located throughout the community--from trade activities to waste disposal--were forced into specially designated areas. These areas became pockets of concentrated filth, which, it was hoped, would have less morbid influence through their distance from more densely populated residential areas. Thus, an attempt was made to segregate and isolate environmental factors related to disease, rather than dealing with them as they occurred in the community.

We can see the same tendencies to spatially isolate "unhealthy" influences on the human and social level. Quarantine measures incarcerated infective people and

impounded goods, while hospitals began to isolate the sick and dying.

By the end of the 18th century, the economic advantages of the centralization of productive forces were also becoming manifest. Thus, we can see, by the end of the 18th century, a strong commitment to isolate and segregate features of social life along lines of social category ("poor", "sick", "worker", for example) (37). This is occurring at exactly the same time that one sees an increase and consolidation in urban population centers. The city, as a center for trade, business and production, begins to sever its ties to the surrounding countryside. Paradoxically, as the population becomes more closely bound spatially, various segments of that same population become disengaged and isolated--spatially and socially. With the 19th century, a new era begins.

NOTES

Chapter II: Colonial America

- (1) Peterson, pp. 2-4.
- (2) Ibid; See also S. B. Warner's Urban Wilderness.
- (3) Warner Urban Wilderness p. 4
- (4) Ibid. 25.
- (5) See Shryock, Medicine and Society, especially Chapter II. Also Rosen's History of Public Health, espec. Chapter V; Duffy, Part I and II.
- (6) See Blake's Public Health In Boston, chapter IV for a discussion of the inoculation controversy.
- (7) Shryock, pp. 82-115, passim.
- (8) The actual mechanism by which disease was spread--particularly fevers--was not understood during this period. Two theories struggled for acceptance. Contagionists believed that disease could be spread from person to person. They pointed out, in the case of Yellow Fever, that local, noxious exhalations could not be the cause of the disease, or it would be endemic. They believed the disease was imported, and spread from the seaport communities inland. Although the contagionists believed that the impure atmosphere could facilitate the spread of disease, and therefore approved local sanitary reforms, they urged stringent quarantine as the primary defense.

Anticontagionists believed that Yellow Fever was just another of the "seasonal fevers" produced by putrid exhalations. They denounced maritime quarantine as a harmful delusion, and urged more comprehensive sanitary reform as the primary defense. Obviously in a busy seaport city--like New York or Boston, the contagionist view had dire consequences in terms of trade. Strict quarantine laws interfered with trade: sanitary reform would probably help trade. Noah Webster and Benjamin Rush, two prominent figures were also leading proponents of the anti-contagionist view. The details of the theoretical struggle between the contagionists and the anti-contagionists

are significant in the history of public health and medicine. The implications of this theoretical struggle are significant for historians of urban development. The anti-contagionist view links disease directly to the environment rather than to people; thus it can contribute directly to the process of urban development. For example, the enforcement of sanitary codes, the provision of sewers, and the protection of the public water supply, can have a direct effect on city form and growth. The contagionist view emphasizes the control of individuals, and only affects city form insofar as it contributes to make this goal easier. The significance of this debate, and its ultimate resolutions will be discussed in greater detail in Chapter II of this thesis.

- (9) While the provision of food and shelter may seem obvious, the establishment of social boundaries was also an "essential" for these relatively small groups, isolated from other cultural ties. See, for example, K. Ericson's Wayward Puritans.
- (10) quoted in Shryock, p. 86.
- (11) *ibid.*, The proprietors of the town wrote to the governor, stating: [We] are very sorry for ye great Sickness you have been troubled with, which we impute chiefly to the unhealthy scituaton of Charles towne."
- (12) *Ibid.* p.86.
- (13) quoted in Blake, p.11
- (14) from the Boston Record Commissioners, Report, II, 1-2 quoted in Blake, p. 13.
- (15) Whipple, p. 5
- (16) Peterson, p. 12
- (17) Blake, p. 26.
- (18) *Ibid*, p. 30. Blake notes that the Selectman continued to show interest in this area, turning down petitions in both 1714 and 1718 to errect additional slaughter houses.
- (19) *Ibid.*
- (20) Rutman, p. 215

- (21) Blake, pp. 27-9.
- (22) Ramsey, pp. 26-7.
- (23) Ibid.
- (24) Rutman, p. 214
- (25) Blake, p. 35
- (26) During the period under discussion here, public health acted in response to urban conditions. In doing so, however, forces were set in motion that were later able to actively shape those environments. During this period regulations tended to be piecemeal and crisis-oriented; by establishing precedents, however, they were later able to become systematic reforms anticipating as well as responding to problems. The development of bureaucratic, organized public health authority was essential for that transformation to take place.
- (27) Benevelo, p. 38.
- (28) The Massachusetts Magazine, 1791, p. 376.
- (29) From John Pringle's Observations pp. 324-5, quoted in Blake, p. 141.
- (30) Buchan, p. 79.
- (31) From the Boston Registry, quoted in Blake, p. 156. Mount Auburn Cemetery, which was opened in 1832 was the result of years of controversy over the health effects of urban graveyards. The garden cemetery movement was clearly inspired by public health concerns, and was to have implications far beyond the initial objective of ending urban burials.
- (32) From the Massachusetts Centinel, 8/20/1788, quoted in Blake, J. p. 157
- (33) Buchan, p. 79.
- (34) From the Massachusetts Centinel, 8/18/1798, quoted in Blake, J. p. 157.
- (35) Ibid, p. 160.

- (36) Rosenkrantz, p. 4; See Blake, J. pp. 151 - 176, for a discussion of the impact of Yellow Fever on Boston (1793 - 1800). Also Duffy, pp. 97-123 for impact of yellow fever on New York City during this same period.
- (37) See Rothman's Discovery of the Asylum and Foucault's Birth of the Clinic for discussion of this process in Europe and the United States.

CHAPTER III: EARLY NINETEENTH CENTURY: VESTIBULE OF REFORM

The same forces that transformed European cities were eventually to affect American cities, though perhaps not so brutally. By the beginning of the 19th century many American cities were faced with swelling populations, both native and immigrant; increasing industrialization, with its associated changes in the economy; and the decline of traditional social structures. Like their European counterparts, they were faced with overcrowding and poor housing, the failure of existing sanitary facilities to meet new demands, and the inevitable disease and misery brought about by those failures. Industrial productivity increased, and cultural homogeneity declined. This process had begun in earnest as the new century began.

Some cities, New York, Boston, and Philadelphia, for example, had been busy cosmopolitan centers for some time--but these were the exceptions. Suddenly new urban centers sprang up. In the decade between 1820-1830 the number of towns in the United States with populations greater than 8,000 had doubled; between 1830 and 1840 that number had doubled again. The greatest gains of all were in the 1840's: New York's population jumped from 300,000 to over half a million; Buffalo grew from 18,000 to 212,000; Chicago, from only 5,000 to over 30,000. (1). With this

growth, came a number of changes--among them, an increase in serious public health problems, and a new social outlook (2).

The American experience was tempered a bit by the fact that the opportunities for expansion--both socially and spatially--were not as constrained here. Beyond actual opportunities for growth, the American ideology nurtured optimism in the face of hardship. It was, after all, the "land of opportunity" where fame and fortune were waiting to be made, and where the rigid class and social restrictions of Europe had been abandoned. The static quality of the old European cities--again, both socially and spatially--had never really existed in America. Rapid changes in the pre-industrial era were simply followed by even more rapid change in the later period (3).

A colonial tradition that protected individual property rights, a laissez-faire economy, and an ideology that stressed individual effort in the face of adversity, did not at first provide a fertile setting for either planning or social reform. It did provide an environment where industrial growth and social change--with their associated problems and opportunities--occurred rapidly.

One of the significant social changes of the period, that can be directly related to increased growth and complexity, was a breakdown in traditional community ties. Early communities in America were closely knit, and bound together through the concept of a covenant--particularly

the New England colonies. This doctrine resulted in a strong moral order, coupled with a sense of community responsibility. The community, through its own resources, cared for "its own"--in sickness and in health, in poverty and in wealth (4). As communities grew--through natural increase, through foreign immigration, and through internal migrations, these common bonds no longer sufficed: indeed, communities often had difficulty defining exactly who their "own" were, and began establishing residency requirements for relief, and other charities. Increasingly, the poor, the sick, the strangers, and the socially marginal were either left to their own devices, or subject to ever more stringent measures of control (5). However, the inability of the old orthodoxy and private charity to deal with the new problems of growth, and loss of community was mitigated somewhat by the rise of a new social view--romantic reform.

Romantic reform was inspired by the belief that the old orthodox theology had lost its validity in a "new" world. The new liberal theology, with which romantic reform was associated, was shaped by a belief in human perfectability. Determinism was rejected in favor of progress. Romantic reform and a new liberal humanitarianism went hand in hand.

Romantic nostalgia for the old pastoral virtues and the perfection inherent in country life played a strong part in the new humanitarianism. There was a strong hostility toward cities, and a celebration of country life which

followed "logically from the assumption that the perfected individual...could be created only by the reunification of mental and physical labor. The rural life...could sustain the...sensibility...threatened by the city."(6) In this spirit, the New York Children's Aid Society planned to remove children from the city and bring them to rural areas upstate for "moral disinfection" (7). Likewise, Robert Hartley, founder of the New York Association for Improving the Condition of the Poor, could advise city dwellers to "Escape from the city--for escape is your only recourse--and the further you go the better" (8).

Belief in the perfectability of man--when removed from the corrupting influence of the city--led romantic reformers into a wide range of social movements, including children's aid societies, temperance societies, abolitionism, and communitarian experiments. These were all designed to eliminate those evils that stood in the way of human perfection and a harmonious social order.

From this tradition come two of the first public health efforts that were not related to any particular crisis, Robert Hartley's Association for Improving the Condition of the Poor (1842) and John Griscom's Report on the Sanitary Condition of New York (1842). Hartley was an Episcopalian, and Griscom a Quaker. The work of both men was profoundly influenced by their religious views. Charles and Carol Rosenberg, writing of the two men, note that, "Physical

health and living conditions, morality and religion were a tightly knit series of causes and effects. The cellar resident no matter how pious could not long remain a productive church goer. Damp, ill-ventilated apartments soon brought disease, depressed vital energies, and inevitably, the (moral tone) as well."(9)

The romantic reformers were, for the most part, moral reformers, believing that man had an innate morality and love of order and cleanliness, and a natural capacity for virtue and health. The city was the villain in this morality play, for it was the city with its dirt, filth, and vice that corrupted these natural tendencies. The association of health, cleanliness, and virtue became a platform for a body of social criticism and a vehicle for public education and sanitary reform. Moral reformers placed the responsibility for disease on social causes rather than Divine retribution. Poverty, not God, caused disease. Robert Hartley, expressing the views of most reformers wrote:

Is so large a number of His rational offspring born with such feeble powers and vitality that life necessarily becomes extinct on the threshold of existence? Such conclusions, being inconsistent with the teaching of His word and Providence must be rejected as impious and absurd (10).

A New York physician echoed Hartley's questions:

Let the poor be taught that there is religion in cleanliness, in ventilation, and good food. Let them be induced to put these lessons into practice...Disease like sin is permitted to exist, but conscience and revelation on the one hand, and reason and science on the other are the kindred means with which God has armed us against them (11).

Sickness and disease, and the poverty that seemed to cause them, were not simply the result of God's will, but rather the result of the misuse of the resources He provided. Those who "had" also had a responsibility to come to the aid of those who "had not" to correct the human causes of disease, poverty and suffering (12).

The shift from Divine to human responsibility for social problems took place gradually over the first half of the nineteenth century. In the confusion, optimism, fear, and doubt, that accompanied urban growth in this period, so did explanations and answers. Powerful ideological arguments developed as people tried to cope with a rapidly changing world.

Often very different views "explained" the same problems. In the first 20-30 years of the nineteenth century, many powerful voices in the city still saw disease quite simply as Divine punishment. Following the 1832 cholera epidemic in NY, a newspaper editorial could quite confidently state:

Drunkards and filthy, wicked people of all descriptions are swept away in heaps as if the Holy God could no longer bear their wicked-

ness, just as we sweep away a mess of filth when it has become so corrupt that we cannot bear it...The cholera is not caused by intemperance and filth in themselves, but it is a scourge, a rod in the hand of God (13).

Yet at the same time, liberal theologians and reformers steadfastly rejected this stern and vengeful view, and put forth an alternative. They saw an inherent beauty and harmony in the world that was upset by human works. These same works could restore order and harmony--everything was within reach: "Between Prayer and the Answer there are many commonplace events. No miracle, but common human agencies." (14)

It is clear that these world views have significant consequences in terms of the city and public health work. Clearly, if evil is the cause of disease and suffering, one need do little about it: a comforting thought for those well off, for those building flimsy tenements, for those not providing for means of waste removal, or for those not paying employees living wages. On the other hand, the romantic reformers and liberal theologians located the source of human suffering not in wicked individuals, but in the community. Despite their pastoral nostalgia, the reformers believed in progress, and saw hope in the same technological developments that seemed to be causing contemporary problems. The Reform ideology became increasingly significant as the century wore on, helping to shape public

attitudes toward the city, health, and poverty. As Charles Rosenberg noted in his study of "The Cholera Years",:

cholera, a scourge of the sinful in 1832 had by 1866 become the consequence of remediable faults in sanitation. Whereas ministers in 1832 urged morality of their congregations as a guarantee of health, their forward looking counterparts in 1866 endorsed sanitary reform as a necessary prerequisite to moral improvement. There could be no public virtue without public health.

Thus the first half of the nineteenth century saw the development of a powerful synergism between the idea of progress and the technique of meliorism, on the one hand, and the identification of poor environments, poor morals, and poor health, on the other. This chapter will show how this connection was recognized and established as a basic tenet of reform, both sanitary and moral. While the actual consequence for city form in this period is minimal, the result is a potent ideology that will have significant consequences for the built environment in the second half of the century.

Early 19th Century Medical Context

The beginning of the nineteenth century in the United States also brought with it an increased interest in disease etiology--inspired perhaps by the visitation of previously unknown epidemic diseases, especially yellow fever and cholera. The underlying cause of disease, and its mode of

transmission became increasingly important as communities attempted to cope with the frightening phenomenon of widespread epidemic disease. Although disease was common enough before the turn of the century, most of it had been endemic--a "natural" event, taken for granted as part of life. The epidemics were different, appearing "unnatural".

The visitations of cholera and yellow fever accelerated the debate in the medical community over the nature of disease. The arguments presented were rather complex. First there was the "nature" of disease to be considered: was disease a singly entity arising from a single source, only presenting itself in different ways, or were there a number of different and distinct diseases? Was there a specific or general etiology for disease? Benjamin Rush, a leading medical figure of the period, believed in the unity of disease. As there was only one God, he claimed, so too there was but one disease:

The physician who considers every different affection of the systems in the body, or every affection of different parts of the same system, as distinct diseases, when they arise from one cause resembles the Indian or African savage, who considers water, dew, ice frost, and snow as distinct essences; while the physician who considers the morbid affections of every part of the body, (however diversified they may be in their form or degrees) is derived from one cause, resembles the philosopher who considers and as simply derived from the absence of health (16).

The matter of underlying cause was related to the mode of transmission: "Cause" for Rush and many of his contemporaries was the environment.

In contrast to the great diversity concerning the nature of disease in the previous century, in the first part of the 19th century there were essentially two theories competing for dominance.

The two main theoretical positions on the mode of transmission of disease were the contagionism, and the anti-contagionism. The first of these, contagionism, was an old doctrine, widespread throughout Europe from the 14th century on, and was probably developed from Biblical references (17). Contagionist theory held that disease is spread from person to person. The exact mode of transmission was not understood, and there was some disagreement between contagionist proponents. Since disease was believed spread from person to person, isolation or quarantine of the infected was an essential preventative. Isolation was often coupled with disinfection of person possessions such as clothing and bedding, which might harbor the agents of disease.

The anti-contagionists, on the other hand, did not believe that epidemic diseases were spread through personal contact, but rather that they arose from local causes. These environmental conditions included "miasmas", filth, decaying organic matter, seasonal changes, and local climate. Since disease had both a local environmental

origin, and was spread through these same factors, isolation and quarantine were unnecessary. Prevention was to be found in removing local conditions conducive to disease generation--in short, sanitary reform. Indeed, given this belief, many anti-contagionists believed that quarantines could be harmful in that they diverted attention and resources from the mission of sanitary reform.

The anti-contagionists accepted the contagious nature of certain diseases--for example, smallpox, measles, and syphilis. They quickly pointed out that these diseases were quite different from other epidemic disease such as cholera or yellow fever. Smallpox, the "model" contagious disease presented with a clearcut clinical picture, occurred independently of season and struck its victims only once. Epidemic diseases exhibited more protean forms, were clearly seasonal, and could strike a person more than once. Many contagionists, for their part, admitted to the influence of environment through the notion of "predisposing" or "exciting" cause. Environmental conditions could thus make one more likely to come down with a contagious disease. (This intermediate position went under the name of "contigent contagionism").

The contagionists had a difficult time proving their case. The epidemic diseases simply did not behave like the "model" contagious diseases. Indeed, until the mode of disease transmission became understood, the contagionist

position was limited. A noted modern sanitarian has commented that "until the theory of inanimate contagion was replaced by a theory of living germs, and to that theory were added the concepts of long-distance transmission by water and food-supply, and above all of animal and human carriers, the hypothesis of contagion would not work...-Hypotheses born before their time are often sterile."(18) The spirit of scientific and medical inquiry that had started in the 19th century also played a part in the debate. The "old" theory of contagionism had not, until now, been subject to careful study. When studied, it seemed unable to explain much of what was happening in the spread of epidemics. Frequently, the leading anticontagionists were also leading scientists of the period.

More importantly, however, the vigor of the "scientific" debate must also be seen in the social context in which it occurred. Ackerknact, in his classic paper on the subject, points out that:

Contagionism was not a mere theoretical or even medical problem. Contagionism had found its material expression in the quarantines and their bureaucracy, and the whole discourse was thus never over contagion alone, but always on contagion and quarantine. Quarantines meant, to the rapidly growing class of merchants and industrialists a source of losses, a limitation to expansion, a weapon of bureaucratic control that it was not willing to tolerate, and this class with its press and deputies, its material, moral, and political resources were behind those who showed that the scientific foundations of

contagionism were naught. Contagionism, would, through its associations with the old bureaucratic powers be suspect to all liberals trying to reduce state interference to a minimum. Anti-contagionists were not simply scientists, they were reformers, fighting for the freedom of the individual and commerce against the shackles of despotism and reaction." (19)

Thus, were the quarantines and sanitary cordons of the contagionists associated with the "engines of bureaucracy, oppression, and despotism" (20).

Both contagionists and anti-contagionists used economic arguments in an attempt to gather support for their position. The anti-contagionist view, with its emphasis on local, environment causes was a potential threat to local real estate values and development. The contagionist view, on the other hand, severely restricted trade and commerce. Of the two, the threat to trade posed by quarantines probably was more influential, since commercial interests had greater political power.

The ascendancy of the anti-contagionist view of disease had enormous impact on cities, since it led directly to municipal sanitary reforms. The anti-contagionist view--the "filth theory of disease"--also complemented a number of growing social reform movements. The combination of medical theory and social theory in public health was to create, later in the century, a powerful instrument for shaping the environment and ideas about it.

Meanwhile, the new public health reform alliance was being born in the depths of the city, as problems caused by rapid growth multiplied and intensified.

A Place to Live: Slums, Utopias and Industrial Towns

The increase in the rate of population growth at the beginning of the century resulted in the severe housing shortages for most large cities. While shortages were to become increasingly severe as the century wore on, a housing crisis was apparent even in the early decades. The new urban populations tended to be poorer and less skilled than those of earlier generations (21). New immigrants tended to remain in the city of their arrival, rather than moving on to the countryside as earlier groups had done, and they therefore required immediate and inexpensive shelter. The result was terrible overcrowding in poor neighborhoods, creating a nidus of disease in the community.

The medical community recognized and deplored the conditions of the poor in crowded urban areas. But distracted by internal disputes over the cause of disease, and periodically faced with the crisis of epidemics, they actually did very little in terms of pushing for specific reforms such as housing, sanitary or building codes. Instead, their efforts during much of this period were focused on documenting the disease/environment relationship showing that it was the living conditions of the poor, and not their personal

habits, that were causing disease. Until that relationship could be firmly established, their commitment to improving housing standards would be uncertain.

The housing of the poor was addressed in a more direct manner by social reformers of the period. Unfortunately, the most progressive of these reformers proposed solutions which were simply not feasible. Utopian experiments and pastoral nostalgia were the order of the day. While they were intellectually stimulating, enriched the American architectural language, and had some long-term significance, they had relatively little immediate benefit on the housing of the urban poor.

This first half of the nineteenth century also saw the birth of the "industrial town"--new towns created around an industrial center. Rather than coping with the problem of overcrowding, developers of the industrial towns had quite the opposite problem. Industrial towns were designed to attract and keep a stable labor force. Since many new industries were located outside of existing cities, and close to the sources of fuel, transportation or natural resources, workers had to be accommodated. A number of industrial towns actually built "model" workers' housing, incorporating a number of public health and social advances. Yet again, these attempts did relatively little to help the

situation of the desparately poor, unskilled, immigrant worker within the older cities.

Finding a place to live became increasingly difficult after 1830 (earlier in some cities, later in others). Living standards for the poor deteriorated and took a toll in death and disease. Both public health and social reformers, though horrified were paralyzed. Public health figures lacked a solid theoretical base to push for reform, although they had the practical and organizational skills to do so. Social reforms grew out of a solid theoretical base, but by their very nature were unable to deal with the practical and organizational requirements of urban reality. A marriage of the two had to take place before widespread reform could take place. The courtship would take place in the first half of the century, consummation in the second.

Birth of the Slum Depending upon the city, it was not until the second or third decade of the century that slums and tenements became a pressing urban problem. Working poor until then lived in boarding houses or in relatively small multiple family dwellings. If these accomodations were modest, they were, at least, usually habitable. Such dwellings were often scattered throughout the community, and while certain neighborhoods were certainly poorer and less desireable than others, enormous gaps between affluence and squalor were not the rule.

At first, American cities seemed to prosper in the first few decades of the century. Epidemic diseases seemed to be on the decline, and even endemic diseases seemed less significant. Industry and commerce were growing, at fairly steady rates, as was population. Some cities, such as Boston, did quite well until well into the century. Being more of a commercial than industrial center, there was relatively little industry in the city, and within its bounds, the wealthy, the well-to-do, and skilled immigrant workers co-existed. The poor, unskilled immigrant who could not survive in Boston's commercial world, tended to move on--either to the countryside, or to cities with a more solid industrial base (22). Although the city tended to have serious problems in terms of sanitation, these either were quite localized, or, shared by rich and poor alike. City streets simply "had" sewage, garbage and pigs. These were taken for granted, and tended to be overlooked until they became so foul as to present a clear and present danger to health. Despite the conditions that would probably horrify today's residents, a visitor to Boston as late as the 1830's could say with some accuracy:

Another pleasant feature of Boston is the many green and shady front yards which relieve and refresh the eye, as you wander through its winding streets. More or less of these are met with, in every part of the city; but

Summer Street is lined on both sides with them from one end to another. This to my taste is the handsomest street in Boston. Town and country seem here married to each other and there is no jar between the husband and wife. It is a harmonious union and a source of many pleasures. (23)

Thus, for the first few decades of the century, Boston remained a rather small, closely knit community, all of which was accessible by foot. People tended to live close to their work, and without great gaps between social classes (24). However, Boston, like its sister cities everywhere, would soon be transformed. Increasing numbers of poor, Irish immigrants would flock to Boston, changing both its physical and social organization. As the city grew in size, and as outlying districts became increasingly accessible, the population particularly the wealthy and solid middle classes, spread out. As they did so, groups with similar characteristics tended to become localized in distinctive areas (25). In terms of the effect on city-form, it was the localization of the poor within the central parts of the city that is most significant. The spatial localization of the poor, coupled with inadequate housing stock, and undoubtedly, real-estate profiteering, gave birth to the American slum, characterized by unprecedented squalor, death and disease.

By 1845, in the wake of the second cholera pandemic, the city of Boston conducted a survey of housing conditions

among the poor. The problem was clearly reaching crisis proportions, and the city took note:

In such a state of things [housing condition] there can be no cleanliness, privacy or ventilation...and with the ignorance carelessness and generally loose and dirty habits which prevail among the occupants, the necessary evils [of life] are greatly increased in both amount and intensity. In Broadstreet and the surrounding neighborhood...the situation of the Irish is particularly wretched...this whole district is a perfect hive of human beings, without comforts and without common necessities: in many cases huddled together like brutes without regard to sex or age in sense of decency: grown men and women sleeping in the same apartment and sometimes husband and wife and brothers and sisters in the same bed. Under such circumstances, self-respect, forethought, all high and noble virtues soon die out and sullen indifference and despair or disorder, intemperance, and utter degradation reign supreme. (26)

It is clear from this passage that although the horrors of tenement life were recognized, disease, "moral degradation" and possible disorder are all blended together--it is indeed difficult to distinguish "cause" from "effect". Lack of clarity about causal sequence resulted in a lack of focus with respect to "treatment". Was the problem public health or public virtue?

Rather than addressing the problem of housing directly, public health leaders collected more "data". The first half of the century is notable in the number of "surveys" and "reports" on sanitary conditions that it produced (27). Certainly some specific public health measures were taken

and the piecemeal passage of local nuisance ordinances of the previous century continued. A number of housing regulations were passed, but they were chiefly concerned with fire-prevention rather than disease prevention. Materials or heights of buildings might be regulated, but not plumbing, privies, air or light. (28)

The situation in New York was not unlike that in Boston--indeed it was probably worse. Between 1820 and 1860 over four million immigrants arrived in New York (29). Most of these were either Irish or German, and from poor, rural backgrounds. New York had had housing shortages even before Boston, and by the 1840's the situation in New York was critical. Newcomers to the city moved directly into already crowded immigrant neighborhoods. The need for housing was so desperate that virtually any roofed structure would do, and flimsy tenements were thrown up by developers unhampered by building restrictions. (30)

Sanitary facilities in these structures, where they existed at all, were minimal. Often a single privy was shared by fifty families. The emptying of privies and cess-pools was still left to private enterprise, and with few exceptions, private enterprise found it more profitable to ignore the situation. New York, became overwhelmed in a sea of garbage and filth. (31)

The situation of deteriorating housing in Boston and New York was repeated time and again in other cities as the century grew older, and as the processes of urbanization, industrialization, and immigration continued. Public health's response to the situation was to recognize and document the sickness within, calling attention to the sickening potential of the slum--for rich and poor.

Escape from the City Many social reformers of the early 19th century, guided by the new spirit of humanitarianism and nostalgia for a simpler, healthier pastoral life, directed their energies toward removing people rather than slums from the city. This is a continuation--though in an inverted form of the practice of spatial isolation. This desire to remove people from the unhealthy and immoral climate of the city became manifest in a range of utopian or communitarian experiments in the United States, particularly between 1820-1850. In 1840, Ralph Waldo Emerson was able to comment that:

We are all a little wild here with numberless projects of social reform. Not a reading man but has a draft of a new community in his waistcoat pocket (32).

The social reformers of the period, despite their diversity, all believed that the environmental problems created by industrialization and urbanization could be solved by a restructuring of the city/country relationship. This restructuring of the social order could be achieved by

building the ideal community--a model which could then be duplicated throughout the country (33). Reform goals incorporated a reworking of both the social and physical environment.

Communitarians, despite their belief in pastoral virtues, were not simply retreating into a pre-industrial Eden. The latest labor-saving and sanitary techniques were often employed. Indeed they were almost always inventive and productive communities. But technology in these communities was simply a tool for improving social conditions--not a means of profit.

The communitarian experiments are important as a social response to urbanization because of the attention that was paid in most of them to the relationship between health, morality and the physical environment. The three were inseparable in most experimental communities, but a sound physical environment was essential for the development of a moral social order and bodily health.

Residential units were an important focus of communitarian architectural effort. To attract converts and to stimulate reproduction of the community most utopian communities attempted to exceed the standards of private dwellings. Detailed attention was paid to the most minute areas of design, always with the effect on the social order in mind (34). Aesthetics and beautification were carefully attended to so that the mental and spiritual potentials of

the members would be maximized. Needless to say attention to sanitation and cleanliness were also emphasized. Through these experiments, members believed that they could demonstrate that health, virtue, and productivity could coexist through human perfectability.

The Utopian experiments were by no means public health "reforms". On the other hand, they were responding to the same set of issues, although from a different perspective. This was the sudden change in the quality of life precipitated by sudden urban growth and intensification of industry. Public health reformers tried to improve the quality of life within the city by changing the physical environment alone. Social reformers attempted to improve the quality of life in the city by changing the moral order of inhabitants. Utopians attempted both, at the cost of removing themselves from the city, and its social organizations. Despite the limitations of the communitarian experiments, their influence went beyond the particular communities they established. They clearly recognized the importance of the physical environment, at a time when others were plagued with uncertainty. They attempted to put into practice environmental planning as a direct response to the new urban problems. The precedent that was set by these social reformers was not wasted on those who came later, and who attempted to build model communities within the city.

The motives that inspired communitarian experiments, when coupled with the technical skills of public health and sanitary reformers during the second half of the century produced an effect far more potent than either could have achieved alone. Public health and social ideology are so interconnected in the later 19th century, that it is virtually impossible to conceive of one without the other. The ideological forces of communitarianism and their environmental focus were the forerunners of later developments.

The Company Town The company or industrial town, that cluster of factory, housing, common space and shops focused around a particular industry, first appeared in the United States at the very end of the 18th century. It is preeminently, however, a 19th century phenomenon. Although company towns often incorporated a number of public health and sanitary measures that would have made the cities envious, and although "moral" conditions might well have satisfied the most ardent of social reformers, the impulse for company towns was quite different from either. It was, quite simply, a business venture. The town typically had a fairly comprehensive plan, with housing and facilities of reasonable quality, even if modest, and some attempt to provide social and recreational facilities. These were designed to attract and keep a stable labor force for indus-

trial production. Indeed the building of such towns was intended to show a profit, even if at a modest rate of return.

The problems that confronted the newly formed industrial towns were not those of overcrowding and filth, but rather problems of transience in the skilled labor force, and, secondarily, of reducing disease to a level where it would not affect worker productivity.

Lowell, Massachusetts was built in 1821 and was probably the first successful planned industrial town. The factories were laid out along the river's energy source, flanked in a simple grid by boardinghouses, row houses, and tenements for workers. A social program was instituted to supervise young and single workers, which made it possible for single women to work at the mills. The town was efficient and profitable, and inspired a number of similar ventures (35).

Company towns demonstrated that profitability and decent living standards were not necessarily mutually exclusive: model tenement developments within the large, older cities would later incorporate some of the lessons learned in the Lowells of the early part of the century. As in the case of Utopian communities, company towns were concerned with the physical environment: however, they too were only able to thrive outside of established industrial

cities, and as such their impact on the mass of the working poor was quite limited.

A Note on Upper-class Housing:

The early 19th century also saw some wonderful advances in housing. Romantic reform for the well-to-do resulted in various architectural revivals, in moves to garden suburbs, in developments of new, spacious and airy designs, with the latest in sanitary facilities and labor saving devices, and all kept sparkling clean by an army of servants. Although public health was concerned with problems of death and disease, and their causes, upper class houses presented no perceptible public health problems. Public health and social ideals of the period were incorporated into well-to-do housing. The city was brought into contact with nature through landscaping, wide boulevards, and shady yards. Ironically, public health ideals clearly had greater influence on the designing of the homes of the wealthy than on the design of homes for the poor. Indeed, the contemporary impact of public health's effect on city form may be determined more by the houses of the well-to-do and their neighborhoods than by the horrors of early slums and tenements, which exist now only in our collective memory and their 20th century reincarnation. Thus while it is difficult to comprehend the filth and misery described by 19th century slum-observers; the "healthfulness" of Back

Bay, or a garden suburb is both immediately apparent, and still with us. Yet however much public health ideals were actually incorporated into city form through the desires of the wealthy, their origins were as a reaction to the conditions of the poor (36).

Care of the Sick: Hospitals and Asylums (37)

We tend today to think of hospitals as a very natural place for medical care to be provided and accept without much question the existence of hospitals in the center of our cities. Both of these assumptions are only recently valid. Until well into this century, most people received medical care in their homes or at a physicians office. The hospital was a place of last resort, for those with neither friends, family, nor financial resources.

Hospitals developed out of a peculiar blend of medical, social and public health forces. The process of centralization and segregation of functional units within the city was already mentioned. That process also had an effect on the ways in which communities dealt with their poor, their sick, their deviant, and ultimately, their dead as well. Hospitals and asylums were affected also.

Urban American hospitals can be traced to two different sources. The first is the "pest-house", which was not a hospital in the way we understand it today, but rather a facility where individuals with diseases thought to be

contagious could be isolated until they either recovered, or succumbed to their disease. Boston's first hospital was the pest house for small-pox victims on Shelter Island, built in 1717. A pest house, because of the functional requirements of isolation was usually located on the city's outskirts, or for seaport communities, on a harbor island. Occasionally during the press of an epidemic temporary pest-houses were constructed within city limits to gather together and isolate contagious cases. But these institutions almost always met with community opposition were rarely of any permanance.

Hospitals for the treatment of most other diseases have their roots in the almshouse. Here, too, there was a process of spatial isolation. During the colonial period the poor of the community were cared for informally by members of the community, often in their own homes. Not until the mid-18th century did more formal caretaking agencies develop, when the almshouse became the recognized institution to care for the community's dependents, or strangers in need. In physical form and social organization the early almshouse was modelled after an ordinary household (38). Since the community's dependents were also often the sick and disabled, the almshouse gradually became transformed into a public hospital for the poor. With the increased mobility and immigration of the 19th century, the dependent poor were typically urban poor. Thus, the hospi-

tal, by way of the almshouse became a part of the urban language.

The asylum too can trace its roots to the almshouse. Unlike the hospital, however, the asylum tended to be located outside the city limits so that the insane could be removed from the disturbances of civilization and thus regain their sanity. The asylum expressed itself in the community as an institution for the spatial isolation of a particular class of individuals--the insane--who had been previously distributed within the community.

The hospital and the asylum were both guided by social and medical theories, but, except for the pest-house, they did not present any public health problem. It might be argued that initially they did not solve any problem either. They are interesting because their physical form and location so clearly refers to the medical and social forces that created them.

With the basic purpose of isolation in mind, the structures designed to control this population are rather remarkable. Order and symmetry of design were the hallmark of the 19th century hospital and asylum. A large central building, with wings on each side became the standard design model. In part the design was inspired by 19th century theories on the importance of ventilation. But the order, regularity and symmetry were believed comforting and

reassuring to the deranged and disabled, thus making them more amenable to control (39). This 19th century model stands in sharp contrast to the "homey" 18th century almshouses. Rather it is clearly an institution of social control. In the earlier period, the social order was relative secure, and no need to impose that order through the physical environment was felt. In the latter period, the social order was confused by change, and the external imposition of order and control through the environment was clearly of some importance (40).

To Bury the Dead: Garden Cemeteries

The sick and the insane were problematic on the social level only when they were poor. Rich and poor alike needed to be buried, however, and the "where" of burials became an important public health issue in the early decades of the 19th century. By the end of the 18th century, concern was already raised about the public health hazards of urban graveyards. Decaying organic matter in the graveyards was seen as a potential threat to health.

In Boston, the move to close urban graveyards and find an acceptable alternative led to the creation of Mount Auburn cemetery, which became a model for others of its type. The story of Mt. Auburn Cemetery illustrates the complex nature of the public health-social reform-city form complex.

Mount Auburn The Cemetary of Mount Auburn was the brain-child of Jacob Bigelow, a prominent Boston physician. In 1825 Bigelow organized a small group of friends in an attempt to found a rural cemetery. The idea was enthusiastically received by his friends, but the public was "lukewarm, if not openly hostile to the idea of removing the dead from the precincts of the city to the solitude of the distant woods." (41)

It was not until four years later, in 1829, when the Massachusetts Horticultural Society was formed, that Bigelow conceived of a way to put his plan into action. Upon Bigelow's suggestion, the society agreed to support the cemetery idea if they could include an experimental garden as part of the design. Such a garden was a cherished idea of the Society, but it lacked the financial resources to bring it about. Sale of the cemetery plots as a way to finance the land purchase. After several attempts to buy land in Brookline, the Society finally purchased about 115 acres in Cambridge-Watertown. It was a tract of land known as Stone's Woods, owned by a man who was himself a horticulturist. The owner had been apprehensive about selling the land to someone who might subdivide it and ruin its natural beauty, and so was happy to offer it, at no profit to himself, to the Horticultural Society. He understood the intended use and enthusiastically supported it. The Society

bought the land, and plans to develop the garden-cemetery got underway.

A Garden and Cemetery Committee was formed within the Society (42), and led by Bigelow and General H.A.S. Dearborn, another prominent local figure, this group developed a design for the land. In fact, Bigelow and Dearborn were almost entirely responsible for it, with a local civil engineer, Alexander Wadsworth, contracted to do some of the surveying, grading, and waterworks. (43)

Within a year of the land purchase the cemetery-garden was opened. A few years later, however, for a variety of reasons, it became clear that the experimental garden and the cemetery could not co-exist. In 1834 the Horticultural Society sold the entire tract of land (at a substantial profit) to the new Corporation of the Proprietors of the Cemetery of Mount Auburn.

This bare narrative does not take account of the social context that provided extra incentive for moving the cemetery out of the city.

Boston's population had increased 50% (from 43 thousand to 61 thousand) in the decade 1820-1830 (44), and with the growth of population the city became increasingly crowded, with new arrivals (both native and foreign) living in close, dirty quarters.

In public health circles a frequently mentioned source of pestilence was the urban cemetery. In 1810, after an

outbreak of yellow fever, the Board of Health imposed a number of regulations on the City's graveyards. One required that "graves be at least 6 feet deep and once a fortnight three bushels of stone lime must be placed under all churches where bodies are deposited."(45) Indeed, the fear of graveyards persisted throughout the nineteenth century. Ten years after the founding of Mount Auburn, the English social reformer Edwin Chadwick captured the sentiment that prevailed during Bigelow's time:

that inasmuch as there appear to be no cases in which the emanations from human remains in an advanced stage of decomposition are not of a deleterious nature, so there is no case in which the liability to danger should be incurred...amidst the dwellings of the living,--it being established as a general conclusion...that all interments in towns contributed to the mass of atmospheric impurity which is injurious to public health. I have no doubts that the burial grounds as at present constituted (intramural burial grounds) are a continual source of pestilence, slow perhaps in its operation and hence overlooked by ordinary observers. They are undermining the constitutional stamina of thousands of our town populations...[W]hen some epidemic comes...the consequences of long antecedent neglect becomes so apparent as to rivet and excite alarm.(46)

And again a half century later the American physician Alfred Buck makes the same point when he attributes typhus, yellow fever, dysentery, typhoid, putrid fever, asphixiation, and "sudden and complete extinction of life" to gases arising from the decomposition of bodies in urban graveyards (47).

Nor were reform ideas far from the Founder's minds. A harmonious, clean, pure environment was vital--to health, to sanity, and to morality. In 1837, Bigelow wrote that the Trustees of Mount Auburn had a sacred obligation to see that the Cemetary "shall continue as place where...the peaceful seclusion of a memorial garden may be reverently cherished in ground forever preserved in its natural beauty."(48)

This natural beauty was not to be admired simply on aesthetic grounds but was part of an ideological statement on the importance of the environment. For reformers of Bigelow's stripe, beauty was important "under a double point of view: first for the pleasure itself which results from it, an second from its tendency to weaken the dangerous inclinations which man derives from his nature."(49) Thus the beautification and preservation of natural settings not only tended to man's physical needs but his spiritual ones as well. Given the social stresses of the Jacksonian era, such mental "well-being" must have been a matter of some concern.

As a public health measure alone, Mount Auburn Cemetery - even if it had been laid out in the tradition east-west grid - can be considered a success. But, it is Mount Auburn's esthetic qualities that make it so special. These same qualities made Mount Auburn the model for other cemeteries, parks and suburban developments. It is a wonderful example of the special affinity between romantic

reform and public health reform. Through Jacob Bigelow the ideals of each movement came together and reinforced each other.

Epidemic Cholera: Sin or Sanitation?

As life in the city became more complex, the wealthy could provide their personal environments with the most up-to-date architectural and sanitary conveniences. For the poor, there were no conveniences. Necessities barely existed. If those with resources were able to shape their own environments, those without, made do, huddled in what shelter they could find. But for rich and poor alike certain common-spaces in the environment were shared and increasingly became pressure points for action. The treat of cholera, over the course of three major epidemics in 1832, 1849, and 1854, triggered major responses to the problem of city-wide sanitation.

Today, we have become accustomed to a level of cleanliness in our city that would have startled a 19th century resident. When cholera threatened in 1832, cities like New York, Boston, New Haven, Newark, and Philadelphia still had pigs roaming the streets. Sewage flowed in open ditches along major arteries, mud and ice plagued unpaved streets, and decaying garbage could be found most everywhere (50). Certainly garbage in the streets was not

new. Moreover people had become inured to a certain level of filth:

For thousands of years city dwellers put up with defective, often quite vile sanitary arrangements, wallowing in rubbish and filth they certainly had the power to remove, for the occasional task of removal could hardly have been more loathsome than walking and breathing in the constant presence of such ordure (52).

But as cholera threatened, the garbage in the streets become suddenly intolerable and significant efforts were made to clean up the city.

Cholera inspired a deep fear in the hearts of city dwellers. As the Columbian Register noted in 1832, "the talk of cholera replaced everything else so that every other subject gave way to talk of it. The Presidential election, the United States Bank, the tariff, the European Coalition have all sunk into oblivion" (53). It was indeed a fearful disease, with a sudden onset and frightening symptoms, more frightening even than the more deadly tuberculosis, whose course tended to be slow and deliberate. A survivor of the epidemic of 1832 noted in his diary that "To see individuals well in the morning and buried before night, retiring apparently well and dead in the morning is something which is appalling to the boldest hearts."(54)

Faced with what they believed was certain doom, most cities leaped into action as cholera approached. Their

responses to an epidemic fell into three general categories: isolation and disinfection--in this category are included both quarantine measures, and attempts to isolate victims in specially erected cholera hospitals, as well as the burning and fumigating of infected possessions; personal hygiene and virtue--citizens everywhere were called upon to assume a more temperate, virtuous and clean lifestyle; and finally, sanitary efforts--in particular, cleaning of streets and public nuisances. Each of these measures exerted a different effect on city form.

Quarantines, as noted earlier, were regarded with considerable hostility by virtually all the city's commercial interests. They were an obvious impediment to trade--both domestic and international--and additionally presented a variety of administrative and financial problems. Yet despite opposition by much of the commercial and medical leadership, quarantines were still imposed during the epidemic, an effort made largely to appease popular demands where contagionist attitudes were strongest.

Additional attempts were made to isolate the victims of cholera through the construction of temporary cholera pest-houses. Infectious disease hospitals were not a typical feature of the 19th century urban landscape. Indeed most general hospitals that did exist specifically forbade the admission of victims with contagious diseases. When cholera became manifest most everyone agreed that hospitals would be

necessary, particularly for the poor and those without family. Despite this agreement, in the abstract, no one wanted a cholera hospital in "their" neighborhood (55). Even with offers of high rents, neither landlords nor ship owners (when ships were proposed as "floating" hospitals) would agree to let their property. Threatened by neighboring residents, they feared that their property would be permanently "tainted" long after the immediate threat of disease had passed. A few hospitals did manage to get built, but most were simple and temporary structures. A very few developed into quarantine stations for immigrants in the latter part of the century (56). While hospital construction during this period left little permanent mark on the city, the quarantines did have an influence on city form through the administrative forces that they encouraged.

In 1832, and to some extent in 1849, people still believed that the dangerous influence of the city could be left behind. Rather than confronting the city and its health problems, those who could, simply fled. It must have been a rather remarkable sight, and numerous witnesses to the exodus have commented on it. Roads and vehicles which a few days before the epidemic struck had been engaged in the transport of commercial goods became overwhelmed with the carriages of families and their personal possessions: the Evening Post in New York described it:

The roads in all directions, were lined with well-filled stage coaches, livery coaches, private vehicles, and equestrians all panic struck, fleeing from the city as we may suppose the inhabitants of Pompeii or Reggio fled from those devoted places, when red lava showered down upon their houses, or when the walls were shaken asunder by an earthquake (57).

The streets of the city were quiet and empty throughout most of the summer of 1832 when cholera was most prevalent. In New York, the prisoners were released and urged to find safer shelter than the almshouse could provide (58). Ironically, the flight from the city contributed to the spread of disease, and pointed out the inadequacies of the quarantine regulations: even if sick immigrants could be kept out through quarantine, there was no effective way to stop the internal migration caused by fear and loathing of the disease.

It may well be that the failure to control population movement, and impose effective quarantines had a greater effect than the success of those efforts would have. The administrative difficulties of temporary boards of health, the lack of consensus between states on quarantine laws, and the lack of authority on the part of local health and civic officials to enforce health regulations where they existed, brought to the public consciousness the need for systematic health reform. Over the years following the first outbreak of cholera, one can see a slow, but persistent move toward the creation of permanent health departments (59). Improve-

ments in the urban condition were dependent upon the creation of an adequate administrative apparatus to deal with health problems. So long as people believed they could "escape" the city, or isolate the infected, that administration would be difficult to organize. The failures during the epidemics aroused a militant and aggressive group of lay people and professionals who recognized the nature of urban health problems, and who took it upon themselves to organize solutions (60).

The role of public health responses in developing administrative mechanisms for dealing with urban health problems is a continuation of late 18th century practices (Boston, for example, had established a local board of health in 1799 as a response to the yellow fever epidemic) The movement had gained considerable momentum by mid-nineteenth century. While institutions like health boards did not leave, in themselves, an impact on the built environment of a city, they were necessary for effective reform of the environment. Administrative institutions, coupled with regulatory and enforcement authority were both required for effective city planning (61). By 1865 there was increasing pressure from the press and other influential sources to enforce sanitary and health regulations through legislative action. Regulation of the health aspects of the city environment was increasingly seen to be beyond the scope of

private interests or temporary agencies, and intensified demands for permanent health agencies were heard.

The other responses to cholera--calls for moral responsibility and sanitary reform are inextricably brought together during much of the 19th century. The relationship between the two undergoes significant transformations as each of the three cholera epidemics swept across the United States. (Rosenberg's Cholera Years is a brilliant examination of the transformation of these relationships.)

When cholera first struck in 1832, both medical and social opinion were united in the belief that "Drunkards are the first victims"(62). Ministers in large cities echoed the sentiments of a New York clergyman in stating that the cholera epidemics served a Divine function:

[to] promote the cause of righteousness by sweeping away the obdurate and the incorrigible...to drain off the filth and scum which contaminates and defiles human society (63).

Cholera was a Divine purge. Filth in the city was not found in the garbage laden streets alone, but was a reflection of the filth in people. While cholera was believed by the more learned members of the medical professions in 1832 to be largely caused by environmental conditions, these conditions were considered to be malignant only to those who were personally intemperate, imprudent, or filthy. These were the characteristics ascribed to the immigrant poor. This

was truly a period where "cleanliness was next to Godliness". The poor were neither clean nor Godly.

Not all was so straight forward, however. Despite the belief that cholera was only a disease of the sinful, cities faced with an imminent epidemic still attempted to clean up the streets and public spaces. In part this stems from medical uncertainty about the causes and transmission of the disease; in part from the liberal theologians and reformers who could not see the vengeful hand of God in the epidemics; and, in part, this was a continuation of 18th century reform attempts to elevate personal hygiene to a public plane (64).

Efforts may have been inconsistent given the prevailing sin-disease beliefs, but demands for a cleanup were strong. The disease was so feared that any preventive measure was considered. Commercial interests were clearly in favor of the sanitary measures as an alternative to the despised quarantines, while the upper-classes feared that spatial proximity to filth might spread disease even to the worthy.

Cities did not differ significantly in the way they went about the clean-ups. Differences were largely a function of the amount of resources--both monetary and personal--that they were willing or able to allocate to the effort. Boston led the cleanup efforts, while some of the smaller Western cities did relatively little. Streets were

swept, privies emptied, stagnant pools of water drained, and clouds of lime disinfectant scattered everywhere (65).

In Boston, fifty thousand dollars was raised for the effort, while a temporary Board of Health Commission supervised the work of the city marshall and his assistants in removing over 1,500 loads of dirt from the street, emptying 3,120 privies, and inspecting residences (66). The city had never been so clean--and many believe that it never again became as dirty as it had been prior to the 1832 clean-up (67). The street cleaning campaign may have been somewhat of an illusion, however, for much of what was removed from streets and cellars appears to have simply been dumped on more distant and less visible streets, in the river or on the railroad tracks. Once again, out of sight appears to have meant out of mind (68). Even so, in 1832 Boston was largely spared from cholera, and many believed this was a result of the city's street cleaning campaign. Its apparent success added credence to the calls for widespread sanitary reform by public health workers and liberal reformers. New York's cleanup campaign was similar to that in Boston, though the results were somewhat more short-lived. The fact that so many inhabitants had left the city, probably contributed to the perception of the city's new tidyness in 1832. Features of the city that many residents had never before seen became visible:

"Where in the world did all these stones come from?" asked an old lady who had lived all her life in New York. "I never knew that the streets were covered with stones before. How very droll!"(69)

The city-wide cleanups undertaken in the wake of the 1832 cholera epidemic were feverish in their intensity, and unprecedented. Unfortunately, once the epidemic threat passed most cities quickly reverted to their customary state of filth and squalor. So long as the cause of disease was fixed in people longlasting environmental changes were not forthcoming. In 1832, popular opinion fixed the blame for cholera on personal fault--an improper "lifestyle" to borrow one of today's phrases. So strong was this belief, that well-to-do victims attempted to conceal the fact of their affliction. Cholera was an indictment, a sign to all that some deep personal fault was involved. In the words of a young medical student, cholera was "decidedly vulgar"(70).

Beyond the potential for establishing permanent health regulatory agencies, and a fleeting glimpse of cleanliness, the 1832 cholera epidemics left relatively few lasting marks on the city environment. But when cholera reappeared in the United States in 1849, a new social climate evoked a different response. The potential for long lasting reform had increased as a result of this shift. The coming together of the sanitary and social reform movements

produced conditions that made for the possibility of permanent changes in the environment. The shift in emphasis is apparent in a comment by a Newark physician in 1849:

Although the remote causes of the disease are enveloped in impenetrable mystery, among the facts we do know are these: that its favorite place of development is where filth abounds; where many are crowded into too small a place; and where noxious exhalations arise.

[emphasis added] (71)

There is here a significant tempering of the sin-disease complex. The social and physical environment of the poor, who were still the main victims of cholera, were held, at least in part, to blame. The voice of the romantic reformers is much stronger. Cities are now perceived as both unnatural and unhealthy. Americans noted with dismay that their slums--which had been relatively small and few in the 1830's--were now rivaling those of Europe. Maybe worse. Pigs, at least no longer roamed the streets of London! Theologians took a leading role in expressing the change in social ideology:

There is something radically wrong in the construction of our cities...The Creator never designed that man should live deprived of air and light of heaven. Imperfect ventilation, impure water, and a crowded population necessarily induce fevers and pestilence.

[emphasis added] (72)

That the environment, not sin, could induce "fevers and pestilence" created conditions in which public health and

social reforms could come together. In such an atmosphere, public health could begin to suggest guidelines for the "good" city. From this point on, public health could move from its proscriptive role into a prescriptive one, working actively to shape urban environments rather than simply responding to glaring defects.

It has already been noted that the period between 1830-1850 was characterized by the proliferation of health and sanitary surveys. By 1849, this "data" could become a basis for action. The association between urban life and increased mortality and morbidity was made clear both in America, and in Europe, through the work of reformers like Chadwick (73). The shift in attitudes that associated increased risk with the environment of the city rather than the character of the city dwellers, enabled the statistical documentation of the horrors of urban life to arouse public attention and sympathy, and to inspire practical activity. In 1849, fleeing the city, or ignoring it, was no longer a viable response to disease. The city was clearly a part of the American social fabric and had to be confronted.

Widespread attention was focused on the unhealthy aspect of urban life when results of a nationwide "scientific" study were presented to the AMA National Convention in 1849. It was concluded that

certain causes [for increased morbidity and mortality] in the city were invariably in operation...among these, deficient drainage, street cleaning, supply of water and ventilation; together with improperly constructed houses and various nuisances incident to populous places (74).

The medical profession was now willing to blame the environmental conditions of the city as the major cause of increased risk.

The transformation of the sin-disease complex to the environment--disease complex was of course only partial in 1849. Sin, moral responsibility, and personal habit always lurked in the background of "scientific" argument. The significant change, however, was in the nature of the causal chain. Sin was still a major factor in disease, but now the environment intervened as a "cause" of sin. Thus, the urbanization of America threatened not only the poor in cities, but the upper-classes and upwardly mobile as well. Lemuel Shattuck, a leading figure in the early public health movement, lamented in 1845 that America's old values were being lost:

the universal thirst for wealth in America, the reckless speculations of some, the haphazard mode of living and the disregard to health of others, the luxury and extravagance of certain classes and other practices of modern society--tend to check the progress of population, and increase disease and weaken the race.(75)

While Shattuck was a great believer in the "scientific survey", like many other figures of the period, he was torn between the belief in the environmental causes his data presented and his personal beliefs about the role of personal responsibility and health. This was a conflict shared by many of the proponents of the budding statistical movement. Writing on its development, Thomas Cullen notes that there

was a continuing dialectic between the relative importance of the moral responsibility of the individual--poor and degraded in the conventional view of the working classes--as against those factors over which he had no control, environmental factors, which depressed and destroyed his character...This dialectic existed as an ideologic tension--...within each statistician (76).

Shattuck, like others, suffered from this tension. He believed, on a personal level, that the condition of the poor was somehow indicative of a moral flaw (77). Yet he was also acutely aware of the difficulties of urban life. His solution to the dilemma was a practical one. Since the poor and immigrants either would not, or could not, take personal responsibility for living in accord with recommended sanitary principles, he advocated by 1850 (in a reversal of his earlier opinions), that the state assume increased responsibility for enforcing sanitary and public health regulations. This kind of a solution was not incom-

patible to either the moralists or the environmentalists in the social climate of the time (78).

Although the social climate had changed significantly by 1850, the practical steps that were taken to control the spread of cholera were not significantly different from those taken in 1832. In Newark, the 1849 epidemic resulted in the hiring of scavengers to cart away garbage, privies were once again cleaned, streets and alleys swept, and a number of ordinances passed to restrict the movement of pigs in the streets (79). And, as in the earlier years, the cities soon returned to their customary state of filth after the epidemic passed.

Appearances are often deceiving however. Although the practical steps taken to prevent cholera did not appear different from those taken twenty years earlier (indeed, one can imagine similar action being taken even in the 18th century), the changed social context had also changed the meaning of these activities. The source of disease had shifted from people to cities, personal hygiene was less important than public hygiene, and the burden of action shifted from the individual to civic authority. Disease and sin were certainly still linked, but the "unnatural and unhealthy" city had become an intervening factor. It was this shift that set the stage for full-fledged environmentalism and broad-based sanitary and public health reform in the second half of the century. Although medical opinion

may have recognized the importance of environmental factors earlier, and although liberal reformers may also have done so, reform in ideology and public health practice had to come together in the popular consciousness for effective action. By 1860 that coming together was nearly complete, and Jacob Bigelow, the physician who had designed Mt. Auburn cemetery could proclaim:

we are...standing in the vestibule of reform, one of the greatest reforms that this country has ever entered upon, the Great reform of the age...The day is rapidly approaching when clinical doctors will scarcely be needed, and when sanitarians will take their places and when we shall not so much attend to the health of the human body, and to the condition of the body politic (80).

NOTES

Chapter III - Early 19th Century: Vestibule of Reform

- (1) See H. Kramer's "Beginnings of the Public Health Movement in the United States" for discussion of urban growth and increasing public health awareness.
- (2) Warner in Streetcar Suburbs comments on the change in attitude during the nineteenth century:

...three sets of experiences and three sets of associated ideas informed men's lives in the city; the increasing industrialization of work was accompanied by the idea of romantic capitalism; the experience of immigration gave rise to nostalgic nationalisms; and the impact of ever more extensive urbanization called for the emotional reaction of the rural ideal. (p. 5)
- (3) Peterson (pp 22-6) provides an interesting discussion on the symbolic and practical advantages of the American use of the simple grid in land development. The grid suggested, by design, a sense of equity and democracy. No district, announced through land use patterns, social distinctions. The grid symbolized urban order and equity.
- (4) See Hodapp for the importance of covenant doctrine and early public health practices in New Haven.
- (5) See, for example, the work of historians, Rothman, Weibe, and Rosenkrantz.
- (6) Thomas, p. 667.
- (7) Ibid.
- (8) Hartley continued "...a few dollars will take you hundreds of miles, where with God's blessing on willing hearts and strong hands, you will find health, competence and prosperity" from Robert Hartley's Seventh Annual Report of the New York Association for Improving the Condition of the Poor, quoted in Bremner, p. 38.
- (9) Rosenberg, Charles and Carol, p. 24.
- (10) Ibid, p. 26.

- (11) Ibid, p. 27.
- (12) The Rosenberg's note that both Griscome and Hartley became involved in public health reform as a result of their intense pietism - an attitude widespread in their generation.
- (13) From the Western Sunday Messenger, 1832, quoted in Rosenberg (Cholera Years) p. 44.
- (14) Ibid, p. 45.
- (15) Ibid, p. 5
- (16) Benjamin Rush, quoted in Powell, p. 230.
- (17) Ackerknacht, p. 565.
- (18) Winslow, quoted in Ackerknacht, p. 566.
- (19) Ackerknacht, p. 568. Ackerknacht's paper on Contagionism and Anti-Contagionism is excellent overview of the controversies of the period.
- (20) Rosenberg, Cholera Years, p. 79.
- (21) See Handlin, especially Chapters I-IV on conditions of immigrants in Boston. See Rosenkrantz, Duffy, Blake, Shryock for changing health status of population. Also Kramer, "Beginnings of PH Movement for relationship between decline in health status and reform activity.
- (22) See Hanlin, especially, Chapters I-IV.
- (23) Whitehill, p. 114.
- (24) Handlin, p. 15.
- (25) Ibid
- (26) From Report on the Internal Health of the City of Boston, 1845, quoted in Handlin, p. 114.
- (27) See Cullen's book on the statistical movement. Although it focuses on the European experience, it offers a number of insights on the general statistical fervor of the day. See also Rosen's History of Public Health, pp. 270 - 5.

- (28) In New York, for example, the first tenement regulations were pushed by insurance companies specifically to reduce the threat of fire.
- (29) Duffy, p. 273.
- (30) Ibid, p. 264.
- (31) See Duffy, "Part III: The City Overwhelmed" pp. 279-329.
- (32) Ralph Waldo Emerson, quoted in Hayden p. 9.
- (33) Hayden, p. 9.
- (34) Ibid, p. 24. Hayden notes that a number of labor-saving devices were specifically aimed at reducing the work load of women, or easing its burden by replacing community involvement for isolated housework.
- (35) See Roth for several interesting discussions of company towns - workers housing. Also a number of photographs and plans of early communities.
- (36) Bunting's book on the houses of Back Bay, and Whitehill's on Boston both deal indirectly with some of the health concerns incorporated into some of Boston's more fashionable neighborhoods.
- (37) For an excellent architectural history of the hospital, see Thompson & Goldin's The Hospital. The author's examine the social and medical bases of a number of significant architectural features. See also Florence Nightingale's "Notes on Hospitals" and Grace Goldins, "A Victorian Hospital Built on Air" for the relationship between medical theory and design.
- (38) Rothman, pp. 42-43.
- (39) Kirkbride, pp. 44 - 64, passim.
- (40) Rothman, p. 188.
- (41) Bigelow, p. 4.
- (42) The committee to establish the Mount Auburn Cemetery included, Justice Story, John Lowell, esq., George Bond, esq. the Honorable Ed Everett, William Stugiss, esq., General HAS Dearborn, Nathan Hale, esq.,

Thomas Ward, esq., Samuel Gardner, esq., John Tappan, esq., and Jacob Bigelow, MD.

- (43) The engineering of Mount Auburn included laying approximately 11 miles of footpaths, 9 miles of avenues (wider roads for vehicles), and a waterworks, including pumping station, 20 wells, and 12 miles of drains and pipes.
- (44) Morrison, p. 225.
- (45) Blake, p. 169.
- (46) From Chadwick's "Report on Interments" quoted in Buck, p. 170.
- (47) Ibid.
- (48) Bigelow, p. 9
- (49) The quote is from Bentham, the English Social Reformer. Bentham and Chadwick, one of his followers, both influenced Bigelow's thought on the environment; both in terms of the form it should take, and the uses to which it should be put. Quoted in Kaufmann, p. 80.
- (50) See Melosi, Introduction. Also Galishoff for sanitary conditions in New Jersey, Blake and Duffy for conditions in Boston and New York.
- (51) Ibid.
- (52) Mumford, p. 75.
- (53) From the Columbian Register, 23 June, 1832. Quoted in Galishoff, p. 438.
- (54) Quoted in Rosenberg, Cholera Years, p. 3.
- (55) Duffy, p. 288.
- (56) Duffy. See chapter 14, pp. 330 - 55 for a discussion of quarantine in NYC. Also see Les Benedict "Contagion & the Constitution"
- (57) Quoted in Rosenberg, Cholera Yrs, p. 28
- (58) Ibid, p. 29.

- (59) Rosen, 229. Rosen notes that the period is characterized by "the slow, hesitant, but nonetheless increasing evolution of health departments"
- (60) Ibid, p. 231
- (61) Duffy, p. 560. See also Lubore, Policing the City.
- (62) Newark Daily Advertiser quoted in Galishoff, p. 440.
- (63) From Gardner Spring, sermon delivered in NYC, 8/3/1832 quoted in Rosenberg, p. 43.
- (64) Rosen 218
- (65) Galishoff, p. 439. A description of clean-up efforts in Newark which was similar to those in many other cities. See Rosenberg's Cholera Years for the most detailed description of efforts in NYC.
- (66) Lane, p. 19.
- (67) Rosenberg, p. 94.
- (68) Ibid, p. 117.
- (69) In Asa Greene, A Glance at New York, 1837, quoted in Rosenberg, p. 88.
- (70) quoted in Rosenberg, p. 57.
- (71) From Dr. JH. Clarke, 1849, quoted in Galishoff, p. 445.
- (72) From a sermon delivered by J. Wilson in NYC, 8/3/1849, quoted in Rosenberg, p. 143.
- (73) The statistical surveys of the period were fairly unsophisticated, and occasionally not totally accurate. Cullen writing of Chadwick's work states it was "a masterpiece of persuasion, subtly blending fact and fiction" Cullen, p 54.
- (74) From the Transactions of the American Medical Society, 1849, quoted in Rosenkrantz.
- (75) Shattuck, quoted in Rosenkrantz, p. 22.
- (76) Cullen, p. 76.

- (77) Rosenkrantz, p. 31.
- (78) Ibid.
- (79) Galishoff, p. 445 - 6.
- (80) Dr. Jacob Bigelow addressing the 4th Sanitary Convention in 1860 quoted in Rosenkrantz, p. 40.

CHAPTER IV: ENVIRONMENTALISM: THE HARMONY OF HEALTH AND REFORM
IN THE LATE NINETEENTH CENTURY

By 1850 the stage had been set for the great public health reforms although two decades would pass until they would be adopted, systematically, across the nation. The American social climate during this period offers some clues as to why the public remained hesitant about the broad objectives of sanitary reform.

In the period between 1850-1870 American cities underwent yet another period of rapid growth. This time, the forces of law and order were unable to cope with new conditions, local governments were often inadequate and inept, and corruption in city governments was common. Civic reform, including the establishment of local police forces, seemed a more pressing problem than sanitary reform. Moreover, enforcement of health regulations required the establishment of effective municipal governments, police forces, and regulatory bodies (1).

The Civil War and the events immediately preceding and following diverted public attention from the urban crisis. There was considerable reluctance on the part of the press in Northern cities to expose the hardships of urban life, in fear that they would be seized upon as examples of "wage slavery" and detract from emancipation efforts (2).

Still the period between 1850 and 1870 was not without reform efforts--in fact, it may have been the abundance of social reform programs that detracted from the rather diffuse objectives of public health reform. Periodical literature of the day contained a variety of articles about the "important" reform issues--slavery, temperance, prison reform, women's rights, treatment of the insane, and prevention of cruelty to animals, to name some of the most popular (3). Public health issues were reported, but not in the shocking, case-study approach that had so popularized the movement in England. Americans had yet to "discover" poverty, and the hardships and sickness that came along with it.

By 1870 however, the conditions were ripe for popular support for public health reform to emerge. During that decade the "underpinning of the old system had cracked"(4) and the "conceptual void"(5) that had confounded European cities decades earlier had reached American shores. Commenting on late 19th century America, Robert Weibe observes:

An age never lent itself more readily to sweeping, uniform, description: nationalization, industrialization, mechanization, urbanization.

Yet to almost all the people who created them, these themes meant only dislocation and bewilderment. America in the late 19th century was a society without a core. It lacked those centers of authority and

information which might have given order to such swift changes.

The entire period of American history from the 1870's through 1920 has been characterized by Weibe and other historians as a "search for order"(6). The movement for public health and sanitary reform constituted a part of that search.

All cities by this time desperately required fundamental services of water, sewerage, paving and transportation. Housing shortages everywhere were reaching a critical stage. Dirt, poverty and disease seemed at the very heart of the city. Sanitary reform and public health regulation were able to address virtually all of these issues. Beyond simply raising the public's awareness of these problems, they could offer practical solutions within the context of a "scientific" gospel. This new gospel was outside of partisan politics and the confusions of the day. It offered order, reason, and stability (7). Health reforms, which had aroused relatively little attention in the previous decade became the most popular issue of the seventies:

Reform was fast becoming a popular cry, raised in protest against the unscrupulous practices of business, the venality of office holders, and the increase of feverish speculation. The contrast between a new industrial "plutocracy" and a spreading pauperism gave currency to that phrase, "the rich become richer, the poor, poorer". Pauperism since it cast a

longer shadow over the nation after 1873 brought with it sickness and disease. Concerning which came first--poverty or disease--there could be no final word, but all humanitarians of the day knew that the two formed an indissoluble partnership. Thus, state medicine provided one avenue toward a solution of the pauper problem (8).

And while cities were certainly the centers of a new national problem, they also offered, within them, the seeds of solution. The public health problems of the city needed the resources of government, labor, business, and intellectual activity for their resolution (9). Cities brought together increasing numbers of people who identified themselves in terms of professional and organizational goals rather than the old identities of community, ethnicity, or religion. These individuals encouraged each other's efforts, and came together in broad areas of mutual concern:

Isolated academics, hopeful young journalists, professional architects, experts in administration and many others gravitated here [in cities] where opportunities beckoned and where they could find enough of their own kind. ...Joining doctors in the public health campaigns, for example were social workers, women's clubs, teachers...lawyers who drafted the highly technical bills; chambers of commerce that publicized and financed pilot projects and new economists... (10)

Increasingly by the end of the century, civic leaders would turn to these experts for solutions to the problems of sewers, water, and housing.

Just as the change in the social climate at the first half of the century gave birth to the potential for public health reform, the shift in the last quarter of the century transformed that potential into a reality. Public health reform could move beyond the "vestibule" envisioned by Jacob Bigelow.

The Medical Context: 1850 - 1900

Agitation for public health reform in the United States first surfaced in the late 1840's, gaining considerable momentum after the passage of the English Public Health Act of 1848. From 1850 on, medical theory increasingly focused its attentions on the environmental causes of disease. The great epidemics of the early 19th century, as well as an appalling increase in endemic disease in the city, all seemed to point to some local, environmental factor which existed in urban centers as the major causative factor in disease. Statistical studies confirmed the popular impression that it was not simply urban congestion, but the particular living conditions of the poor that caused the increased mortality and morbidity (11). From this, public health reformers argued that sanitary reform offered the most logical and effective means of reducing disease rates.

Against a background of increasing death and disability in the city, traditional medical practice could still offer little in the way of cure. Only prevention through environ-

mental control seemed promising as a way of reducing mortality rates. Improvements in public health, supervised by local and state health boards, could, it was believed, "help the physician by giving him an exact knowledge of the causes and prevalence of disease...[and help him] construct a much better theory of medicine."(12) Improving the health of the poor in cities would benefit all--even if only indirectly--since sanitary reform "fulfilled the charitable intentions of practical Christianity" (13).

From 1850 through the late 1870's the American medical profession and members of the public interested in health related matters generally gave primacy to the miasmatic theory of disease. As in earlier years, disease was thought to be caused by an invisible, but detectable "miasmata" arising from decaying vegetable matter, and offensive effluvia arising from slaughterhouses, swamps, sewers, and other "traditional" public health nuisances. So firmly did Americans believe in this view of disease, that not until the late 1880's did they consider European work on the germ theory, or conduct their own experimental work designed to either prove or disprove the theory. Phyllis Allen Richmond notes that this reluctance on the part of the American medical profession

may have fitted the general cultural pattern of that age in science, apparently partly due to the lack of university educational

facilities, partly due to the preeminence of divinity and law as favored professions for the intelligensia, and partly due to the emphasis on applied science over pure science (14).

Whatever the exact reason, at the time bacteriology as a science was being developed in Europe, American medical theory was in virtually the same position it had been in the first half of the century. As late as 1885 a number of American medical textbooks made either no reference, or only passing reference to the germ theory (15).

After 1888 the germ theory of disease began to take on increasing importance and potency in the United States. However, the germ theory and environmentalism were not totally incompatible. Progressive public health and medical practitioners accepted the germ theory where it seemed applicable, or modified it to make it compatible with a filth theory. It was not until the time of the first World War that sanitary reform was almost totally replaced by an attention to microbes and the individuals that harbored them as the point of application for any practice.

Home Sweet Home: Housing and Health

Bags and rags and papers, tramps and other
slappers, Italian lazzaronies, with lots of
other rots, Laying in benches and dying there
by inches from the open ventilation in
McNally's row of flats.

[Harrigan and Brahms song, 1893]

The documentation of deplorable tenement life by health reformers which had started in the early part of the century continued. The grimness of the statistics became even more apparent as poverty and the housing shortage continued to worsen. Social reformers too continued to educate the population about the problems of housing and poverty. Not only did tenements breed disease but they destroyed the moral character of its residents as well, particularly the children (16). While health and social reformers continued to gather their evidence, they also made substantial efforts to raise the public consciousness of slum conditions. The combination of overwhelming amounts of data on the health and social consequences of urban slums and reformist zeal brought an increasing number of attempts to improve urban housing from 1860 on. These efforts culminated in the New York city Tenement Reform Bill of 1901 which was to become a model for most other large cities (17).

For health reformers, the catalyst for housing reform was the experience of the cholera epidemics. The environmental focus of disease theory encouraged cleaning up urban filth, rather than isolation measures. Indeed, some medical authorities believed that attempts at isolation only contributed to the spread of disease:

It follows that our true course is to make a diligent search for all localizing circumstances and to remove them so as to render the locality untenable to the

epidemic. But quarantine makes no such search, and leave all such localizing conditions untouched and unthought of (18).

Since escape to the countryside was no longer even imaginable, and since neither health nor social reformers could envision cities existing without tenements (in the original sense of multi-unit dwellings), the focus of reformers became one of improving their quality. These improvements would take the form of improved sanitary facilities, increased ventilation and ample light. In this way, the disease producing potential of tenements could be reduced, if not eliminated (19).

Until 1850 there had been relatively little new housing created for urban immigrants. They either lived in converted commercial structures, in small shacks and cottages (particularly in cities like Chicago where some 200,000 lived, with no paving or sewers in a "frame jungle" around the packing houses), (20) or they moved into existing stock vacated by the geographic mobility of the upwardly mobile classes. The 3rd Annual Report of the Bureau of Statistics on Labor in Massachusetts reported that:

houses...long inhabited by the well-to-do classes of people are vacated by them for others in more fashionable quarters [from South End to Back Bay]...and then a less fortunate class of folk occupy for a while...they in their turn to make room for another class on the descending scale...Until houses once fashionable...become neglected, dreary tenement houses into which the families

of the low-paid and poverty-smitten crowd by the dozens (21).

However, by the 1870's this process of conversion was no longer adequate to meet the demand and new tenements began to appear in unprecedented numbers. Indeed, the yards, gardens and generous spacing around older, once more fashionable areas, made them ideal locations for profit hungry developers. Every inch of space was filled in. Existing structures were redesigned and expanded. Handlin writes of the process in Boston:

The abundant grounds surrounding well-built early Boston residences and the hitherto unusable sites created by the city's irregular streets, once guarantees of commodious living, now fostered the most vicious Boston slums. Every vacant spot...yielded room for yet another dwelling...This resulted in such a swarm that the compiler of the first Boston Atlas gave up the attempt to map such areas, dismissing them as "full of sheds and shanties"(22).

In Chicago, the housing crisis became acute after the Great Fire, resulting in a dramatic increase in the number of multi-family units, all quickly and cheaply built. By 1872, Chicago's Health Commissioners were urging the passage of a tenement reform bill, but here as in other cities, the profits derived from tenements resulted in strong local opposition to regulation (23). Unlike attempts to change tenements in the early part of the century, this was a specific piece of legislation, designed to regulate building within

specific parameters. Although public health reforms were often popular, they could not yet compete with powerful real estate interests who saw regulation as a threat to private property, that most sacred of American values.

The growth of filthy tenements within the city limits of Chicago paralleled the growth of respectable, well-designed suburbs on the outer limits of the city. Tenements were for the newly arriving immigrants, or the poorest of the poor. Everyone else moved to a more healthful environment as soon as circumstance would allow. Thus the worst of the housing stock was made available for the next generation. This kind of geographic mobility was only possible in American cities where a reasonable amount of land, fairly inexpensively priced, lay in close proximity to the city, and where transportation increasingly made the work-day commute a possibility (24).

But for all the talk about the "housing" problems of the 19th century, it was mainly a problem of poverty. In contrast, upper class environments improved by the latter part of the century. It was in the upper class suburbs that one could find the latest public health ideas such as open spaces, air, light, and adequate sanitary facilities, as well as an interest in civic government. This was a time for "beautification" and developing urban identity. At least one city health official noted the contrast between

cultural efforts of the middle and upper classes, and the conditions of the poor. He stated rather bluntly, that

Before erecting statues, building opera houses and art galleries and buying expensive pictures, towns should be relieved of odors and fermenting pestilence. Good privies are far higher signs of civilization than grand palaces and fine art galleries (25).

Thus, sanitary reform became linked to the notion of civic improvement. It is not merely to help the poor, but a sign of the "good" or "civilized" city.

Of all the major cities faced with housing problems, New York was perhaps hardest hit. Its shortage was most severe and was producing the worst physical and social ills. Its problems had also started much earlier than in most other cities. Attempts to legislate housing reform with a strong public health emphasis were taken seriously in New York as early as the 1860's with an official housing "policy" whose stated goal was to provide "safe and healthy homes". However, although the policy existed, it was not defined in specific terms, nor were there any official agencies to enforce even its modest objectives. Rather, local voluntary and charitable organizations took it upon themselves to oversee slum conditions. They believed in public health objectives, but had neither the authority nor the funds to effect any changes (26). They did, however,

continue to expose conditions in an attempt to gather popular support.

New York's difficulties in regulating tenements stemmed in part from its real estate patterns, rather than a lack of public health initiative. In 1866 New York had passed the Metropolitan Health Bill, a straightforward consequence of reform agitation in the wake of the cholera epidemics. The Bill mandated improvements in the physical environment through sanitary inspections (The Bill was a model for similar bills nationwide) (27). This legislation was a major victory for public health reformers. Unfortunately, its immediate significance was undermined by the by now familiar curse of understaffing and underfunding, with the political machinations of local real estate interests contributing to its ineffectiveness.

These interests constituted a sizeable constituency. A survey of tenements in the early 1870's showed that for 20,000 tenements there were over 18,000 individual owners. This large group of small owners, with the help of a few large developers, formed a vocal, and powerful coalition to block regulations. Since the tenements housed mainly foreign immigrants public health and social reformers were accused by the group of being "agents of foreign powers" (28). Through the efforts of real estate groups, public housing policies tended to focus on the problem of

individual homes, rather than the more pressing, and controversial, problems of the tenements. The main resource for tenement control remained in the traditional areas of nuisance abatement and what might loosely be called zoning regulations. In their fight for improved ventilation for tenements, reformers faced a major setback in 1877 when a court decision announced that people had no right to "light and air".

Despite these setbacks, some advances were made during the 1870's. The Board of Health exercised its traditional authority of nuisance abatement by restricting the operation of slaughterhouses within the city, traditionally held to be health hazards. In addition, the Board of Health cooperated with the Building Department to discourage frame construction in the city (29).

Public health theory also placed a heavy value on light and air as a means of reducing disease. While filth was considered the actual cause of disease, it was believed that it was most malignant in dark damp, unventilated quarters. The healthful effects of light and air were the medical foundations of the 1879 Tenement House Law of New York City which stipulated that no more than 65% of a lot could be covered by a building (30). Inspectors, however, had a great deal of discretionary power, which they apparently used. A survey of tenements at the end of the century revealed that most tenements covered 85%-95% of their lots (31).

At the same time, the New York City Board of Health was granted rather broad powers of entry and inspection. It had the authority to "order any building, excavation, premises, business pursuit, matter or thing to be purified, cleaned, disinfected, altered or removed." In its first rush of activity, the Board removed 160,000 tons of manure from the streets, issued 5,386 complaints, and initiated 759 law suits--all in the summer of 1873 (32). The Board tended to focus on improvements that would improve the healthfulness of slum environments and alleviate some of the social problems of the tenement areas. Members of the Board believed that through an improvement of the physical environment, the values of the dominant class would be instilled in the hearts and minds of the immigrant poor. Tenements were arenas of socialization. The medical reformers and social reformers still shared much.

Spurred on by public health and philanthropic interests, New York was also the site for a number of privately sponsored experiments in tenement housing. The experiments did much to attract public attention, although their effect on the very poor was limited by their relatively small scale.

Among the private interests interested in tenement reform were the insurance companies. Insurance had become quite popular in the United States after the civil war (33). Although few tenement dwellers had life insurance, tenement

owners had fire insurance. In an attempt to lower the number of fire claims, the companies urged building standards to reduce fire-hazard. Some of the earliest tenement regulations, passed in 1867, were urged on the city by insurance companies. These regulations controlled building heights, setbacks and distancing. They also specified specific construction methods. (34)

The private medical aid societies were also interested in lower disease rates among workers who collected benefits, and joined the fire companies in urging for reform (35). While public health reformers traditionally urged regulations that would reduce fire hazards, it differs slightly from other public health concerns in that it is not dependent upon any disease theory. Although regulations imposed to prevent fires have a significant effect on building within the city, it should be noted that they spring from a different source than the health-morality complex that provided the strongest foundation for 19th century public health reform.

Another private organization, the New York Sanitary Reform Society was founded in the early 1870's. It's members were a coalition of health and social reformers, as well as a number of commercial interests. The Society's objective was to improve the physical environment of the city through sanitary reform. In 1878, with the Society's

support, the Sanitary Engineer and Plumber, a trade journal, sponsored an architectural competition for the best tenement house design.

From over 200 entries, John Ware's design for the "Dumb-bell Apartment", with its pinched center to admit light and air, won. The dumb-bell design became the model for New York's tenements, although its influence outside the city was limited.

Other groups saw commercial potential in the interest in public health. Plumbers, in particular, were anxious to ensure "properly designed" tenements, with required plumbing, installed by qualified plumbers. They of course, noted that only trained plumbers could install fixtures in a way that would not create health hazards, a notion hesitantly supported by health officials who were worried about the noxious fumes created by improper plumbing (37). Plumbers, together with health officials, pushed the city to pass regulations within its building codes regarding the installation of plumbing. (38)

Yet another privately sponsored experiment, in the 1870's was Alfred White's Improved Dwellings Company which proposed a number of model tenements for workers. White tried to appeal to both health and humanitarian concerns as well as "good business". He attempted to show that good design and construction could be economically profitable and at the same time satisfy health and social concerns. His

dwellings incorporated the "latest" in sanitary facilities, were well ventilated, and provided ample open spaces for gardens and children's playgrounds. While White's designs did attract attention, in a period of minimal regulation, builders often discovered that shoddy construction was both possible and even more profitable. Although units like White's 1890 Riverside Apartments, were "inspirational" and demonstrated the feasibility of healthful tenements, they did not become the norm (39).

Yet the pressure for reform continued. As a result of the public attention created by private experimentation and exposes of tenement conditions, social and health reformers were able in 1879 to force municipal authorities to add amendments to the existing Tenement House Bill (40). By 1895, through their efforts, an entirely new bill, with more stringent regulations was passed. Still not satisfied, a further effort was made by Lawrence Veiller and Robert de Forest, who held a tenement house exhibition in 1900, to further amend the laws. Their exhibition contained numerous photos, maps and graphs, along with the by now familiar set of grim tenement health statistics. The graphic materials, in particular, succeeded in creating a sufficient public outcry to effect the passage of the New York City 1901 Tenement Reform Bill (41). The 1901 Bill prohibited the dumb-bell shaft design, since ironically what was once a model was now considered a nuisance, spreading noise, smells

and disease through its central shaft. In addition, the Bill required bathroom facilities for all new apartments, and instituted a number of new fire preventive codes. Based firmly on current public health theory, and with the support of a variety of social reformers, the Bill was seen as the culmination of several decades of work, and became the model for similar reform bills nationwide (42).

The situation in Boston during this period was not unlike that of New York. From 1860 the belief of health and social reformers was that "filthy and degrading surroundings doom the poor to immoral and unhealthy lives" (43). Boston's active private philanthropies assumed most of the responsibility for helping the poor, and may have slowed public demand for municipal action. The need for municipal action remained, however, and through reform efforts Boston passed a Tenement House Act in 1968. The bill provided that minimal standards be met in all tenements. These standards included the requirement of one privy to every 20 persons, a waste disposal system linked to city sewers, and the appointment of health officers to inspect slums. A familiar story accompanied the passage of the Act: no provision was made for enforcement (44). Health officials thus continued to complain that "there are no places in the settled portions of Boston where the low paid toiler can find a house of decency and comfort."(45)

Boston did have a long and progressive public health tradition, but many of its sanitary efforts until mid century were focused on public projects like water works, land filling and regrading (46). Although public health reformers did document the unsanitary conditions of the city's slums and tenements, there existed a reticence to intervene in what was considered to be the responsibility of individual landlords and tenants. There thus existed a tension between what reformers saw as necessary improvements in the physical environment and the best way of achieving this end:

effective devices were developed for bringing public services to the property owner. The supervision of individual performance, however, was lightly touched upon, and no effective machinery was devised for public assumption of responsibility when owners failed in their performance. The official policy was to interfere as little as possible with individuals (47).

In part this policy of non-intervention must be seen in its economic and political context. Real estate interests in Boston, as they had been in New York, were an extremely powerful group. In addition, until around 1870, this reluctance also may have been a reflection of the long standing ambivalence about the causal connections between disease, poverty and living conditions (48).

By 1870, however, reformers in the city of Boston decided that slum reform was a necessity, and Boston's Dr.

Henry Bowditch traveled to London to investigate reforms in that city. He returned enthusiastic and optimistic, feeling certain that the living conditions of the poor could and should be corrected with the help of state health officials. Bowditch was most impressed with the work of Octavia Hill, particularly her belief that appeals to reform character were doomed to failure unless they were accompanied by a strict attention to all details of the physical environment for health. He stated with confidence and certainty that:

"Health, physical and moral, are the results of the model lodging house."(49)

Always a man to act on his convictions, Bowditch helped found the Boston Cooperative Building Company in 1871. The Company's stated goal was "to cooperate, in so far as possible with the middle and lower classes of people in providing houses for them" (50).

Bowditch's efforts were similar to those that were going on in New York. The unfortunate lesson of that city was that private efforts were simply not adequate to alleviate the housing crisis. At best, they served as models for what might be done (51). Given the limited success of private efforts, Bowditch and other reform leaders eventually urged the State Board of Health to assume greater responsibility in controlling housing deficiencies. Bowditch called for the state to "provide for the physical and moral well being

of the urban poor who must now occupy those purlieus of filth which predestines their victims to a life of disease and destitution."(52) And gradually, mainly on the strength of Bowditch's recommendation, the State Board began to assume responsibility for housing. At first this was in limited areas, and with limited authority. In most cases, if conflict developed between the State Board and local interests, the Board would only exercise its authority in the traditional area of nuisance abatement. Thus, in 1878 the Board restrained local slaughterhouses, despite opposition, through its traditional authority to prevent pollution of streams (53).

By 1880 Boston was following a pattern very similar to that in New York. There was an incremental increase in housing regulation pushed forward largely by health and social reformers. As the more well-to-do moved to the suburbs, the city's housing stock increasingly became the domain of poor immigrants. Boston gradually continued to improve its municipal services. Those of a general nature such as water, sewers, cleaning were largely public rather than private, and were distributed throughout the city to rich and poor neighborhoods alike. These probably contributed to some improvement in the quality of life in tenements, although changes in the housing stock itself were slow in coming (54). Public health practice did however set the standards for such improvement as occurred. Public health

reformers, now convinced of the importance of filth in the cause of disease, sought the active cooperation of social reformers and went beyond simply responding to the most glaring deficiencies. Unlike responses in the earlier part of the century they began to make recommendations that would not only correct existing problems, but by setting standards and imposing regulations, would prevent their reoccurrence. The ability of public health workers to accomplish this objective was often limited by co-existing political and economic factors, but the objective itself was clearly articulated. By the end of the century, largely through the work of public health reformers, Boston, like other large cities had initiated a series of tenement reform acts which would regulate future construction. The "healthy home" was now defined through statute.

Home Sweet Home: Utopia Revisited

Little idea can be given of the filth and rotten tenements, the dingy courts, and the tumble down sheds, the foul stables and dilapidated outhouses, the broken sewer pipes, the piles of garbage fairly alive with diseased odors, and the numbers of children filling every nook, working and playing in every room, eating and sleeping in every window sill and seeming literally to pave every scrap of yard.(55)
(Late 19th century account of a Chicago tenement district)

Such was the reality of tenement districts in the late 19th century. Public health reformers responded to it in two

ways. First, they tried to provide a scientific basis for tenement reform. An 1875 publication on the prevention of "filth disease" stated unequivocally:

It has been among the oldest and most universal of medical experiences that populations living in filth and within direct reach of its influence succumb to various diseases which render opposite conditions comparatively or absolutely unknown. In filthy urban districts where the foul air comparatively incarcerated in courts and alleys and narrow streets...the population always shows an increased mortality...The hurtfulness of Filth is certain.(56)

The dangers of filth would, moreover, apply not only to the poor and badly housed but to the well-to-do as cities became increasingly congested:

a second point which equally with the above needs to be recognized by all who are responsible for the prevention of Filth diseases, is: that Filth does not only infect where it stands, but can transmit its infective power afar by certain appropriate channels of conveyance...Thus it has happened again and again that an individual house with every apparent cleanliness and luxury has received the contagium of [some] fever.(57)

The potential of filth diseases to spread from the poor to the not-so-poor acted as yet another catalyst to reform, attracting broad-based popular support.

Public health attempted to go beyond providing a basis for reform. It also offered a program, and provided an image of the ideal, and healthy city. This ideal, according

to the apostles of public health, could be achieved through the application of sanitary principles to city planning. This would be a slow and often tedious process, but the vision it offered was exciting, capturing the public's imagination and interest.

These visions of the healthy city were a new kind of Utopia, quite different from the utopian experiments of the early part of the century. Although the aims of public health, broadly conceived, were an important part of the early utopias, they were not the primary objective. Instead they had focused on the relationships between physical and social relationships. The long tradition of utopian literature had likewise always had an explicit medical component, but again, never as its primary focus (58). In 1875 a new, explicitly medical, utopia appeared to capture the public mind. Inspired by the work of Chadwick and the passage of the English Public Health Act, Benjamin Ward Richardson published "Hygeia: A City of Health". Hygeia differs from all earlier utopias in that the promised land is devoted entirely to "health". It was enormously popular both in Europe and the United States and appeared as the ultimate application of the sanitary idea.

Hygeia was first presented by Richardson at the annual meeting of the Health Section of the Social Science

Association in England. Before presenting his address, Richardson told his audience:

It is my object to put forth a theoretical outline of a community so circumscribed and so maintained by exercise of its own free will, guided by scientific knowledge, that in it the perfection of sanitary results will be approached, if not actually realized, in the lowest possible general mortality with the highest possible individual longevity. I shall try to show a working community in which death...is kept as nearly as possible in its proper or natural place in the scheme of life.(59)

Unlike a number of earlier utopias Richardson's Hygeia did not call for a transformation of the basic social, political, and economic institutions of the society. Rather, it was a projection of an ideal towards which Richardson felt great strides had already been made, a "technician's blueprint for a sanitary utopia, roughly within the framework of ... existing ... institutions".(60) It is particularly in this way that Hygeia stands in contrast to earlier Utopias. This "realistic" approach is squarely within the tradition of public health reform, and unlike the romantic utopias of the early 19th century did not contain the nostalgic call to a simpler, more pastoral way of life. Hygeia was, in every way, conceived of as a city. But it was a city transformed through the sanitary ideal.

Hygeia, in the words of one reviewer, was a "city of which even city planners could have been proud."(61) It

projected a model which some twenty years later would be incorporated into a number of "garden city" designs. The plans called for relatively low density with buildings not to exceed four stories in height, and an abundance of gardens, lawns, and open spaces. It also incorporated the latest technology for water supply and waste removal. Buildings and streets were constructed of easily washed brick. Even the interiors of houses were made of glazed, multi-colored brick for ease in maintenance and cleaning. Basements were condemned for their lack of light and ventilation, and completely eliminated. Noisy factories, laundries, slaughterhouses and other offensive trades were located outside of city limits, as was agriculture. The city was a residential, commercial and recreational center. Hygeia had an administrative force that saw to it that all sanitary rules of the city were enforced. These provided the 'basic cleansing needs and went on to cover such things as the use of public buildings, the conduct of funerals and burials, and the working conditions of the various trades."(63)

Richardson predicted that death and disease would dramatically decrease in his city (from 22/1,000 to 8/1,000; before Chadwick and sanitary reform figures around 35/1,000 were not uncommon in large cities). He felt that the details of his city had been slowly evolving through the

work of Chadwick, and that future generations of reformers would continue his work to achieve Hygeia. It was no mere utopian vision for Richardson, who told his colleagues that

We shall continue to work successfully for its realization. Utopia is but another word for time; and someday the masses who now heed us not, or smile incredulously at our proceedings will awake to our conceptions. Then our knowledge like light rapidly conveyed from one torch to another will bury us in brightness.(63)

The message of the City of Health spread well beyond its original audience of sanitarians and social scientists. British and American physicians read it and were impressed. Edward Janeway, New York's Health Commissioner told the American Public Health Association in 1880 that "the city there described Utopian at present, will be approached in the future."(64) The rich were inspired to build "Hygeian residences; tradesman sold Hygeian goods; villages and towns called themselves Hygeia; and Fabian reformers incorporated a number of Richardson's ideas into their own plans for a national health service. Some twenty years later, Ebenezer Howard quoted from Hygeia in original version of Garden Cities of Tomorrow (65).

Howard's work on Garden Cities received relatively little attention when it was first published, and it was dismissed as yet another Utopian scheme.(66) Yet its influence in the fifty years following its publication quite astonishing. Howard's vision, rather than Richardson's was

to be realized. Although Howard's work was not as explicitly medical as Richardson's, public health and social reform ideology of the period certainly show their influence. His great contribution, according to Mumford, was in his ability to synthesize rural and urban improvements as a single problem:

The garden city as Howard defines it is not a suburb; not a mere rural retreat, but a more integrated foundation for an effective urban life.(67)

Howard's work, like Richardson's directly confronted the problems of urban life. The city, was not to be fled as in earlier Utopias but transformed. And like Hygeia the garden city explicitly, though not exclusively, confronts the problems of health, housing and sanitation. Through garden cities, Howard asserted,

the old crowded, chaotic slum towns of the past will be effectively checked and the current of population set in precisely the opposite direction--to new towns, bright and fair wholesome and beautiful. [emphasis added].(68)

In many ways, works like Richardson's were the precedents for the garden cities and new towns of the twentieth century. Planners after 1900 were the beneficiaries of the great strides made by social and sanitary reformers over the previous forty years. The reformers' demands for light,

ventilation, pure water, sewerage and garbage removal, were all taken for granted by Howard and his followers, no longer utopian dreams. The public health ideal and its definitions of the healthy and salubrious environment were all accepted although the details, many of them technical, still needed to be worked out. Because of the great advances made by sanitary reformers, planners could turn their attention back to improving the quality of social relationships through the physical environment.

Consumption and the Environment: The Bowditch Report

The same Henry Bowditch who was concerned with housing reform was noted for many other contributions to public health in the last half of the nineteenth century. In many respects his views on the effects of environment on health typified those of others and therefore merit some additional detail.

In addition to the threat to life posed by epidemic diseases, endemic diseases also took its toll of life. Of these, consumption was the major killer. In 1865, Bowditch gave an address to the Massachusetts Medical Society, "On The Topographical Distribution and Local Origin of Consumption in Massachusetts" (The Bowditch Report). The following propositions contain the essential points of his report.

"First, A residence on or near a damp soil, whether that dampness be inherent in the soil itself, or caused by percolation from adjacent ponds, rivers, meadows, marshes or springy soils, is one of the primal causes of consumption in Massachusetts, probably in New England and possibly in other portions of the globe."

"Second, Consumption can be checked in its career, and possibly, may probably, prevented in some instances by attention to this law."(69)

Bowditch supports his "law" through the use of available mortality statistics and the observation that certain towns, parts of towns, or houses had a higher prevalence of consumption. He concluded that "dampness of the soil of any township or locality is intimately connected, and probably the cause and effect, with the prevalence of consumption in that township or locality."(70) In the following tables, Bowditch examined consumption rates in various towns, looking at "dampness" and other topographical variables.(71)

Bowditch's analysis included several examples of particular houses where consumption had been common, providing maps illustrating their unhealthy locations. Adjacent towns had different consumption rates because of location.(72)

Bowditch also attempted to apply his beliefs about the relationship of consumption to soil conditions in his own medical practice, moving one patient from her "lovely"

residence "with its long avenue of wide-spreading trees...its quaint and picturesque architecture...the abode of many generations of refined taste and ample fortunes. Nevertheless...it was like a cellar." Within six months of her move to a dry town, she was nearly recovered. Unfortunately, missing her family, she returned and soon died. (73)

A practical man, Bowditch wanted to see his "laws" provide guidance for action. He urged his fellow practitioners to encourage consumptive patients to move to drier locations and urged them to supervise the thinning of trees and vines shading consumptive houses. Bowditch urged them to inquire about the cellar of residences, which might be damp even if the surroundings were dry and suggested that they advise their patients to move or avoid a building location in areas where houses rest on damp, wet soil, or were near wet meadows, rivers, or marshes. Even houses on hills were at a risk, if the subsoil was a damp, wet clay. Bowditch describes the "ideal" location -- one in which risk would be minimized. He relocated patients in Needham, drier portions of Sharon and Canton, and the Isles of Shoals with apparent success, and believed that Nantucket, Martha's Vineyard, Block Island, Nahant and Winthrop would also be suitable locations. The islands of the New England coast could be developed, he hoped, as "places particularly fitted

for many of our citizens, who prefer to remain near home to seeking health further south."(74)

Continuing in this practical vein, Bowditch urged the State to improve the quality of its statistical registrars so that the siting of public institutions--"hospital, prison, almshouse, normal school"--could be accomplished thru application of scientific and hygenic laws.

This firm belief in the regularity of the laws of health and nature was a counterpart to the deeply held beliefs of the reformers who saw a profound harmony between the spiritual and natural worlds. Bowditch himself was an abolitionist in his early years and is the paradigm of that unique blend of reformer and public health practitioner that provided such a powerful influence on the face of the city.

Water: Pure and Plentiful

The search for a pure and adequate water supply was not new in the late 19th century, although the demand was greatest then. As early as 1790 Noah Webster had advised his fellow citizens that:

Water is perhaps the best purifier of houses and streets of cities as well as of infected clothes. The use of water cannot be too liberal; but care must be taken that none of it remains to stagnate about or near buildings.(75)

Webster concluded that without adequate water the population would suffer from disease and pestilence and city dwellers would

wallow in filth, crowd their cities with low dirty houses and narrow streets, neglect the use of bathing and washing, and live like savages. (76)

According to water historian, Nelson Blake, the provision of a pure and adequate supply of water was an "indispensable precondition" for the growth of American cities at the end of the 19th century. Before this, most American cities had drawn their water almost exclusively from springs, wells, and cisterns. These local sources became increasingly inadequate in both quality and quantity as the population grew. By 1860 most cities had learned that they could no longer depend on them. They discovered that "at whatever expense or difficulty they must impound the waters of outlying lakes and rivers and bring this life giving stream through aqueducts and pipes, into the very homes of their citizens." (77)

Although the greatest advances in securing water for the cities occurred after 1865, attempts to supplement individual wells and cisterns can be found as early as the late 18th century. Both Boston and Philadelphia, for example, were experimenting with piped water in the 1790's. These early experiments were small private ventures, and were

never designed to supply the entire city. They were intended only for those citizens able to pay for the improved quality, or convenience of supplied water. Often private companies marketed their water on the basis of its improved quality. Lacking the color, taste or smell that often marked city wells, piped water was perceived to be more healthful. While the quality of water supplied by private companies may have been superior to local water in the early years of development by the 1840's these companies came under increasing criticism. Private suppliers were in business to make a profit, not provide a public service. By mid century the public felt that the profitability of water was often more important to suppliers than the quality of their product. The questionable practices of the Manhattan Company, a private water company in New York, for example, led the New York Post to write an angry editorial:

Some wells [of the company] have been dug in the filthiest corners of town; a small quantity of water has been conveyed in wretched wooden pipes, now almost worn out for family use; and in a manner scarcely, if at all, preferable to the former method of supplying water in by carts...the stockholders have gained profit and political influence...- the Legislature has been cheated and the City has ever since suffered.(78)

Demands for abundant, clean water became ever more strident as the 19th century wore on. The increases in population density had made local supplies of water totally

inadequate. Without even considering the quality of water, it was obvious by mid-century that the cities needed more water.

The demands for a more copious supply had a number of origins. The filth theory of disease required water as a means of prevention. Water was necessary not "only for domestic purposes, but for public baths, for cleaning the streets, and for the general purification of the city."(79)

Fires, too, were becoming a serious problem toward the end of the 19th century as valuable urban land was built up. Wooden buildings were crowded together on small and narrow streets, and fires soon went out of control. Water supplied through wells and cisterns were not able to meet the fire-fighting requirements of cities. Mayor Josiah Quincy of Boston was particularly fearful of fire in the city's congested areas, and wrote:

My great wish is to abandon the system of forming lines and passing buckets at fires: and for this purpose [would like] to introduce hose companies based on the Philadelphia system. (80)

Seeking advice from that city's Water Commissioners, Quincy got the following reply: "If you get a supply of water let no company supply you, let it be the property of the city, and under the controls of the its corporate authorities." (81)

Some years later, the Mayor of Baltimore also stressed his city's need for water.

If Baltimore was a finished city and was only to survive until its present tenements and warehouses shall have decayed and fallen, the present system of supplying it with water might be tolerable. But her destiny is one of greatness and strength and those charged here with legislative authority should, before its too late, confer upon her that benefit which is of estimable value.

A plentiful supply of pure water is essential to the health and cleanliness of our city--and it is also of the first importance in the extinguishment of fires.

(from the 1853 Report of the
Water Commissioners) (82)

While city officials wanted water to promote business prosperity, foster growth and combat fires, public health reformers demanded improvements in the quality of water as a means of reducing mortality. Water of good quality was necessary for drinking, and water in good supply was necessary for personal and municipal cleanliness. And, in a manner characteristic of the 19th century, there was a moral demand for pure water since temperance reformers demanded a pure and palatable water supply as an alternative to "spirits" (83). The public supported all of these positions--and added their own voice anticipating the great convenience of piped water supplies. Perhaps the New York City Water Commissioners summed it all up best when they

stated that a piped water supply would make the whole population "happier, more temperate and more healthful."

Thus, while demands for improvements to the water supply system came from a number of sources, behind almost all of them was a claim to the improvement of health that water would bring. Public health reformers were most insistent on a public water supply that would be universally distributed throughout the city. They repeatedly cited the failures of piecemeal attempts to solve the water problem, and stimulated the first real effort at comprehensive, city-wide planning in the form of a water supply system.

The result was that beginning in the 1840's and with renewed vigor after the Civil War, cities began large scale water-works. The insistence upon city-wide service by public health leaders forced municipal authorities to think about the problem in new ways. Technical and engineering planning was substituted for the patchwork, makeshift efforts characteristic of the earlier period:

Gradually cities abandoned their cisterns and wells and pumps or retained them for supplemental use. Unlike first experiments, built as a response to yellow fever...[later] works set a new standard--universal, city-wide service.(84)

Administrative forces that had been struggling for authority hailed the water works as a triumph. Such large scale efforts had demonstrated that city-wide planning was

feasible, and could have demonstrable effects, particularly in the areas of public health and safety. The water works became of symbol of civic pride. In New York, the Water Commissioners announced:

No population of 300,000 ever before voluntarily decreed that they would execute such a work. No population but one off rement would have conceived of such an idea. ...Countless millions hereafter will enjoy the benefits of this water, will have clear heads, correct eyes, strong arms, and instead of walls, present breasts so strong, and hearts so brave that in a just cause our city may defy all foes.(85)

Once started, waterworks were aggressively extended to all parts of the city. In Boston, water was supplied to all parts of the city equally--from the North End to the Back Bay. Because of the capital intensive nature of installing water mains, reservoirs and pumping stations their cost could only have been met though municipal and state financial backing. The popularity of the sanitary engineering programs--water being the first--assured strong support and thus generous public expenditures (86).

Though public health theory had stimulated the interest in waterworks economic interests soon came into play. Business and commercial interests in the city believed that plentiful water would attract new business and raise the city's productive capacity. It was argued that through improved health, and greater business activity, water works

would soon pay for themselves and generate surplus revenues that could be used to finance additional public health programs.

The provision of piped water in many large cities also dramatically changed the lives of residents. An indicator of this change can be found in the statistics on changing use patterns of water. When local sources were used for water (mainly wells) the per capita consumption, per day, was between 2-3 gallons. In the 1850's consumption in the city was around 50 gallons per day, increasing to around 150 gallons per day by 1880. Indoor plumbing became, at last, a popular and realistic ideal. Many houses had a sink, basin, and washtub, and the ultimate luxury of a water closet was becoming more common. By the 1880's most of Boston's houses had running water, and around 25% had waterclosets. The increase in the per capita consumption of water can only partially be accounted for by increased drinking and cooking use, however (87). A great deal of the newly acquired water was simply wasted. Inadequate heating in most houses made frozen pipes a constant threat in the winter months. In an effort to avoid burst pipes, many residents simply left their new faucets running, day and night.

Water Pure and Plentiful: Consequences

Many claims were made on the extent of actual improvement in health attributed to an improved water supply. It

is difficult to verify their accuracy. Ironically, the negative health effects of piped water are better known. These negative effects are not a result of the water itself but the relationship between the water supply system and the sewer system.

Hundreds of cities after 1850 installed waterworks, yet not for over thirty years did a single city simultaneously build a sewer system to remove the water it supplied (88). The consumption of water far exceeded the engineering estimates of demand, and cities were literally flooded with waste-water. Before the introduction of piped water systems citizens disposed of waste water by dumping it into the street, into dry wells, or occasionally into privies or cesspools. Relatively small amounts of waste water were absorbed by these systems, and presented few problems. When piped water was introduced, most citizens simply continued their old practices. There was indeed no alternative. The result was that "cisterns became cesspools, low spots became sumps, old storm drains refused to dry out" and flooding occurred throughout the city (89).

Although water was supplied to remove disease causing dirt, the lack of sewers resulted in filth being spread over increasingly wide areas. Citizens had neglected Noah Webster's advice, and water, liberally used, stagnated everywhere. As cesspools overflowed, spreading their

noxious contents everywhere, the cities looked and smelled worse than ever. In crowded tenement areas where wells were often still in use, the water supply became contaminated by cesspool overflows and life for the poor was even more threatened. Waterclosets, increasingly popular after 1880, were among the most serious of water-related problems. Waterclosets had become a feasible alternative to the privy only after running water was introduced into households. Since no provision was made for removing the watercloset wastes, most people simply ran wastes into their old privies. The results were disastrous with backyard privies soon becoming flooded with stagnant and offensive fluids (90). While most cities prohibited the practice of running waterclosets into cesspools, these ordinances were rarely enforced. Health officials became increasingly concerned about this technology that originally had been seen as providing great health benefits. In 1894, the Pennsylvania Board of Health complained that:

Copious water supplies constitute a means of distributing fecal contaminants over immense areas, and no water closet should ever be allowed to be constructed until provision has been made for the disposition of its effluent in a manner that it shall not constitute a nuisance to the public health.(91)

Indeed, while the watercloset was enthusiastically supported by the public--particularly those able to afford

them--it was a constant source of public health concern. An editorial in Scientific American heartily condemned it:

The present watercloset system, with all its boasted advantages is the worst that can be generally adopted because it is a most extravagant method of converting a mole hill into a mountain. It merely removes the bulk of our excreta from our houses to choke our rivers with foul deposits and rot at our neighbors doorstep. It introduces into houses a most deadly enemy, in the shape of sewer gas (92).

John Simon, the English sanitarian whose writings were very influential in America, echoed this sentiment: "The workings of an ordinary watercloset is easily deranged...and apt to become a very dangerous nuisance."(93) He warned that the problem was made worse because the upper-classes were so insistent upon indoor facilities. The largest, most fashionable houses "needed" waterclosets as a symbol of their modernity. In these areas, Simon went on, people tended to place their trust in "architects and builders...-[who have] a very imperfect recognition of the dangers which this arrangement must involve."(94)

The problems of waste-water and excreta disposal resulting from piped water were critical for the city. Piped water also resulted in a less obvious problem that required regional, as well as city-planning. The newly supplied water had to be protected at its source. Since water from a single source would now be distributed to an

entire city, any disease causing impurity at the source would have city-wide health implications. In 1880 a Boston physician warned:

Typhoid fever is a filth disease, the poison which gave rise to it was bred in filth, especially sewage from houses. No water supply should ever be contaminated from the slightest amount of sewage, or polluted with organic matters of any kind...The neglect of these precautions means disease.(96)

In this way, the influence of sanitary authorities was pushed beyond the immediate confines of the city to extend to the entire watershed region. The water of one city, drawn from an outlying area, could be affected by the practices of another distant city, and piped water supplies in many cases resulted in increased dependence between cities, and strengthened the role of state or metropolitan health authorities. Comprehensive planning became a necessity.

Thus while providing water to the city was an extremely important project, with definite health objectives, the negative health effects pushed reform even further. One of the most significant of these additional reforms, was the movement for planned sewage. The immediate demand for sewers were a result of the nuisances created by their absence, but again the roots of the demand lay in the public health movement. As Joel Tarr has noted:

the numerous failures that plagued sanitary reformers served as necessary prelude to the larger successes to come. Only through crisis and death could a fragmented urban environment evolve to a state of awareness and consensus to deal with the problems that plagued it.(95)

Sewering the Cities

The object of the sanitary movement may be summed up in a few words--a sewer in every street of every town and village; a drain in every house; a constant and unlimited supply of water to every family; pure air at any cost, the application of refuse of towns to the purposes of agriculture; and lastly to secure these blessings, the removal of every impediment, physical and moral, and the destruction or reconstruction of every form of local administration which does not work well toward these righteous ends.

[from Fraser's Magazine for Town and Country, Nov, 1847]

Thus were the goals of the English public health movement, and the model and inspiration for American Sanitary reforms of the late 19th century. The provision of a "constant and unlimited supply of water" to households had been the first of the major public health reforms undertaken in the United States and the supply of city-wide water service led directly, within the public health context, to planned sewerage. And while water established the environmental necessity of sewerage, it also provided the technical prerequisite to water carriage sewerage--an abundant supply of water.(97)

As noted above, the abundance of water in the cities after 1850 demanded that old waste removal practices change. The old system of scavengers was clearly no longer adequate as privies and cesspools constantly overflowed.

Many cities did have an existing sewer network, but they were storm sewers. Sometimes open ditches, often large diameter pipes, they were never designed to carry wastes. Indeed, many of the existing sewers were already overtaxed by the increased water from rain run-off that was a consequence of street paving. The storm sewers simply overflowed when household waste water was run into them. The problem was even more serious when waterclosets became fashionable. The additional water increased flooding, made more serious by the fact that the water was contaminated with human wastes. In cases where large diameter pipes were use, the amount of water running through them was not sufficient to flush them clean, and the whole affair became a stinking, offensive mess with serious health consequences.

Several solutions were proposed to deal with the health and nuisance effects of water. Several were quite innovative, including replacements for the water closet, but were never implemented on a wide scale. The solution that was adopted in many cities, as a first attempt, was simply an administrative change. The law that prohibited the dumping of wastes in storm sewers was simply repealed. The results, it was soon discovered, were disastrous. As entire

cities dumped their wastes into storm sewers, the sewers became "elongated cesspools filled with putrescent material that generated sewer gasses that [were believed] to cause zymotic or infectious diseases."(98) The public that had demanded the right to dump waste the storm sewers soon demanded an alternative--a planned system designed to remove wastes. Health officials, horrified at the prospect of raw sewage covering city streets, added their voice to the call for reform. Sewerage became, literally, the talk of the town. Joel Tarr notes that Americans looked hopefully to the English for guidance, since London had been successfully sewerred in the mid-century.(99) Debates on various technologies were frequent taking place

in the public press, in engineering and public health journals and meetings and were reported in the sanitary texts and sewage reports of the day.(101)

The Massachusetts Board of Health claimed that "the prosperity of a town, city, state or country stands in immediate relation to its sanitary condition,"(102) and urged the installation of a sewerage system. Though everyone acknowledged that such an undertaking would be costly, it was predicted that sewerage would decrease the mortality rate from 19/1,000 to less than 15/1,000. As in the case of water, it was predicted that the economic savings produced by the decline in mortality would eventually pay for the

system. George Waring in his widely read Sanitary Drainage of Towns and Houses argued that the financial benefits alone that would accrue to cities if they installed sewerage systems should motivate municipal authorities if compassion were not sufficient. Some calculations claimed that planned sewerage would, in fact, cost no more than the existing scavenger system. From past experience, reformers knew that the claim of improved health was not sufficient to inspire municipal authorities to spend vast sums. So, they gathered evidence to suggest that sewerage would give cities an "urban advantage".(103) Similar arguments had been effective in inspiring waterworks. It was noted that improved sanitary conditions resulted in a faster rate of growth and prosperity. Businesses, they claimed would move to cities with sewers. By the end of the 1870's most cities had become convinced that the benefits of sewerage were worth the expense and gradually cities began to plan their systems.

The urban advantage argument was particularly effective in Southern cities. In the South until after the Civil War, relatively little attention had been paid to public health issues, in comparison to Northern cities. In the years after the War, the South experienced a new urban growth, and with it, the same health problems that had plagued northern cities. The economic climate in the South after the War was

already precarious, and disease was seen as a threat to business and commercial interests. A number of cities responded vigorously to the newly perceived public health threat: "Progressive merchants, bankers, and shopkeepers perceived the crisis in public health as a business problem to be solved by business methods: business situations governed their thinking on every health issue."(104)

In 1879, 200 New Orleans businessmen organized a sanitary organization with their motto, "Public Health is Public Wealth". A spokesman announced their position that:

We are satisfied [that] the investment of our money as a business enterprise [is] remunerative in the absence of...disease. We fully recommend other communities to take stock liberally in works of private and public sanitation.(105)

The spokesman added that sewers were among the most important of those public works of sanitation, and that southern regions with the fewest miles of sewers had the slowest rate of urban growth.

By the 1880's most cities clearly recognized the need for a systematic method of waste removal in which responsibility was shifted away from the individual (where enforcement was weak) and onto municipal authorities. Speaking of Pittsburg, Joel Tarr writes that:

Beginning in the mid 1880's a new sewer system that differed from the one in existence [was begun]. It was based on the idea of water carriage, defined as the removal of wastes through a pipe network by a continual flow of water. Hence the name sewerage which refers to the removal of sewage by water. Engineers designed the new system. There was a realization that a sewerage system was an essential requirement for a healthy, modern city.(106)

Most cities adopted a similar program.

The combination of water supply and the resultant sewerage systems had a number of consequences. Since public health concerns prompted the reforms, health outcomes were clearly important. Indeed, the reformers were correct and sewerage did result in a decline in mortality, though often not as great as they had hoped for.(107)

The provision of a sewerage system also changed the city's outward appearance and smell, through the removal of drainage ditches, flooded cesspools and waste odors--all of which were, in themselves believed to be health hazards.

Sewerage also had implications for tenement reform efforts. Pittsburg, in 1887 began plumbing inspections and the regulation of plumbers through a new division of the Bureau of Health. Each building was required to file detailed plans of all connections to the sewer with the city's inspector. Similar regulations were passed in most cities, and form a familiar part of today's building regulations.

Once water and sewer lines were in place, public health reformers turned their attention to replacing the privy system entirely. With sewers the potential health benefits of the watercloset could be realized. After 1900 many cities required waterclosets in all new construction, a significant requirement in the New York City 1901 Tenement House Bill. This, in turn, led to an expansion of the water-sewer network into areas of the city that were either underserved or unserved entirely. In this way, municipal authority spread over an increasingly large geographic area. (108)

Sewering the major cities, was one of the great public health reforms of the 19th century. Inspired by public health and social reformers, put into place by engineering professionals, and planned by municipal authorities, sewers quite transformed the urban environment. Sewers removed filth from the streets, made possible a variety of modern "conveniences", improved health, led to the regulation of construction and building practices, imposed design constraints through building codes, and expanded municipal authority and responsibility. After city wide sewerage was in place, the city began to become a decidedly different place.

Waste Removal: Garbage

DID YOU EVER STOP TO THINK THAT:

A clean town means a sanitary and healthful town.

A clean town means a more beautiful town.

A clean town means an increase in the value of our property.

A clean town brings business to our merchants.

A clean town induces a better class of people to locate here.

[C.B. Crane "The Work for Clean Streets" NYC Women's Municipal League, 1906]

Sewering the cities resulted in the removal of a major source of filth from the streets. By no means did it effect a complete clean-up of the city. Numerous additional sources of filth remained, from horse manure to household wastes. These solid wastes were seen as both a source of disease and an aesthetic annoyance. An often overlooked aspect of 19th century sanitary reform is the development of a systematic plan for urban rubbish removal.

Well into the mid-19th century, wastes were most commonly tipped into the streets where they remained until they decayed or were eaten by animal scavengers. In more "progressive" cities, a crude scavenger system was often employed. Individuals contracted to have their wastes removed by cart, and they were then dumped outside the city into open fields, rivers, or other bodies of water. Washington D.C., the Nation's most progressive city in the area of waste removal, did not begin to collect residential

wastes until 1856--and then only non-cumbustible wastes were removed.(109)

While urban streets would be considered filthy by modern standards, to the 19th century eye (and nose) they were tolerable. But by the end of the century, as cities grew larger and more complex, and as the quantity of wastes to be removed increased, the existing marginal systems simply failed. The head of Boston's Street Department wrote in the 1891 annual report that

The reason why the streets had grown more filthy from year to year was easily discovered. The system of cleaning in vogue, while it answered for twenty years ago had been completely outgrown. Notwithstanding the enormous growth of the city, the system had never changed to keep pace with the growth.(110)

The garbage problem was equally bad in most other Northern cities. Southern cities had even greater problems. Even the crude street cleaning systems that had grown out of public health concerns in the North were not in existence in the South, and the heat and the climate made dumping garbage an even more serious hazard to health. Southern cities tended to dump their garbage conveniently out of sight but never far from residential areas. The results were appalling. The 1879 meeting of the American Public Health Association was treated to the following graphic description:

Thither were brought the dead dogs and cats, the kitchen garbage and the like, and duly dumped. This festering, rotten mess was picked over by rag pickers and wallowed over by pigs, pigs and humans contesting for a living in it, and as the heaps increase, the odors increased, also, and the mass lay corrupting under a tropical sun, dispersing the pestilential fumes where the winds carried them.(111)

This scene was typical. Without the tropical sun it could be in "Any City". By the last quarter of the century, garbage and refuse removal was a problem that demanded new solutions.

As with so many other issues, before solutions could be developed the problem needed to be "discovered" and become a part of people's consciousness. Much as social reformers earlier had awakened Americans to poverty in their midst, sanitary reformers launched a campaign to raise the issue in the public's mind. Public health, social and municipal reform groups were anxious to find a solution to the garbage problem and they joined forces to push for a city-wide clean up.

City streets were condemned both on aesthetic and on health grounds. Reformers reminded citizens that NYC clean-up efforts helped avert a cholera epidemic in 1860 and that similar civic cleanings on a permanent basis might offer some protection from other dread diseases.(112) The "garbage question" became a popular topic in the press, with publications urging their readers to take note of the filth

around them and to remove it. Publications like Harper's Weekly challenged their readers with such feature articles as "What Shall be Done with the Garbage?" Harper's noted that "as the world grows older it becomes not only conscious of new problems which it had to solve, but it becomes more keenly conscious of old ones which it had only imperfectly met." (113)

Voluntary agencies expanded their efforts to include educational campaigns on the evils of garbage. Neighborhood "improvement" groups met to sweep streets and clean up local areas. Garbage was also a popular topic of a number of women's civic associations. The Ladies Health Protective Association of New York was formed in 1884 specifically to deal with the problem of garbage and filth on the streets. It was one of the most influential groups of its kind, and served as a model for other groups across the country.

By the 1880's, through the efforts of the press, public health officials, and voluntary reform groups, most Americans had "discovered" their garbage, and set about the task of cleaning up. It was an effort that appeared to require a Hercules. There were two distinct facets to the problem. First, garbage must be collected, and then, once collected a suitable site or method of disposal had to be found. Public health concerns were central to both aspects.

Cities dealt first with the problem of collecting and removing waste from the streets since this was the more immediate threat to health and an affront to the senses. The mere quantity of wastes that needed to be removed presented difficulties. In the City of Boston in 1893 street cleaning teams were able to gather over 350,000 loads of garbage while Chicago produced over 2,000 cubic yards of wastes daily. Manhattan produced 612 tons of garbage daily, except in the summer months when the figure rose to 1,180 tons daily. Included were the rinds of some 750,000 watermelons that New Yorkers consumed on each summer's day.(114) Adding their share to the domestic wastes were the horses, the mainstay of transportation until well into the 20th century. A municipal engineer calculated that 1,000 horses deposited 500 gallons of urine and 10 tons of dung on city streets daily. As late as 1914 horses in Chicago produced over 600,000 tons of manure. The methods for sweeping, collecting, and carting these wastes were crude and simple: brooms, pushcarts, and horsedrawn carts. In the process of carting wastes away much was spilled adding to the nuisance and the next clean up.(115)

Public health groups urgently pressed city officials to assume responsibility for refuse collection. The problem was simply too vast, and seen as too dangerous to be left to individual initiative. A City of Boston special sanitary

commission to study the waste removal problem reported in 1893 that:

The means resorted to by a large number of citizens to get rid of their garbage and avoid paying for its collection [through private scavengers] would be very amusing if it were not such a menace to the public health. Some burn it, while others wrap it up in paper and drop it when unobserved on their way to work, or throw it into vacant lots, or into the river...the destruction of garbage by individual households in any large city is too dangerous an experiment to be seriously considered by any intelligent community.(116)

Thus beginning in the 1880's most cities gradually transferred responsibility for refuse removal from the individual to the municipality. One of the most colorful and influential figures involved in this transformation was Colonel George E. Waring, Jr. Waring had had a national reputation in the field of sanitary reform for some decades. Most of his early work dealt with problems of sewerage and drainage, and he was the designer of the innovative "separate" sewer system for Memphis in the 1880's.(117) In 1895 he became the flamboyant Commissioner of Street Cleaning in New York City, which had one of the worst refuse problems in the nation. He vowed to clean the streets but demanded he be allowed to do it his own way, free of political interference. Desperate to get the job done, the City agreed. Waring declared that "there is no surer index of the degree of civilization of a community than the manner

in which it treats its organic wastes" and he then went to work.(118)

Waring's environmentalism rested on an unshakable belief in the filth theory of disease. He was absolutely certain that cleaning the streets, along with proper sewerage would dramatically reduce New York's health problems. Waring also believed that he had a broad health-based mandate to improve the urban environment. His objective did not stop with street cleaning but included community action and education programs, paving programs and household sanitation demonstrations.

Waring's exaggerated claims, his flamboyance, and his quaisi-military approach to the sanitation problem produced widespread ridicule at first. But by the end of his brief tenure as commissioner, New Yorker's could walk or drive down streets and sidewalks that were cleared of piles of garbage and manure and both the public and press showered him with praise.(119)

Waring understood very well the importance of image management in waging his war against garbage. One of his earliest efforts in the city was directed at improving the image of street cleaning crews, elevating them from the "scavenger" role. He dressed street cleaners in white uniforms, and smart cork helmets, dubbed them "White Wings" and attempted to build an identification in the public mind

between the white clad street cleaners and doctors, nurses and other health professionals. Waring organized his White Wings and led them in several parades down Fifth Avenue with much pomp and circumstance.(120) Though the atmosphere was decidedly circus-like the publicity advanced Waring's influence.

As always, public health reforms, even in the area of rubbish removal, maintained close ties to other social reform movements. Waring firmly believed in this affiliation, and organized tenement children into a "Juvenile Street Cleaning League". This was, Waring felt, not only a way of cleaning up the streets, but of accomplishing social good. The children were provided with examples, given responsibility and learned good social values.

Through the efforts of Waring in New York and similar street cleaning departments in other large cities, urban environments did, in fact, become cleaner on a permanent basis. Earlier street cleaning ventures had been strictly crisis oriented and even when they were immediately successful no permanent change ever occurred. Now administrative mechanisms for municipal responsibility for garbage collection became firmly established.

Techniques and methods of collection varied from city to city, but the principal that garbage was dangerous, and that it was a municipal responsibility to remove it was

firmly established by the turn of the century. New York, with complete municipal control was a model for many cities, while others contracted for the service. In those cities, where service was contracted the significant break with the past lie in the fact that now the municipality, rather than individual households let the contract.

By the end of the 19th century, clean streets had become a part of the symbolic image of the "ideal" city. The clean city was the good city because it was healthful and more beautiful. The health appeal of clean streets in the 1890's was fused with the aesthetic appeals of the City Beautiful movement, a fusion that was both natural and complementary.(121) Indeed civic improvement--which included sanitary reform--was one of the original objectives of the City Beautiful movement. A health reformer noted:

We gladly hear much today about civic art; but it is well to remember that civic art without civic cleanliness is a diamond ring on dirty hands. The adornments of a dirty city do but emphasize its dirtiness, while cleanliness has not only a virtue, but a beauty of its own.(122)

The cleanliness that was required for health became desired also for its beauty.

Once wastes were collected they had to be disposed of. Open dump sites were condemned as a health hazard. So was dumping vast amounts of garbage into the water. A number of cities turned to incineration as a means of reducing the

volume of waste. This was held out as the ideal and ultimate solution of the 1890's, awaiting only the technological advances that would make large scale incineration practical. Unfortunately the subsequent story of refuse disposal is not quite so happy as that of collection. Traditional methods continued in spite of the hazard they presented. As late as 1941, 27% of cities were still feeding over 2 million tons of garbage to pigs. Although progress in this area has been slow, at the very least sanitary reform converted it into a problem whose health implications were accepted, even if not very effectively resolved. (123)

The Significance of Water and Waste Removal for Urban Development

The provision of water to the cities, the sewerage that was its consequence, and the removal of garbage and filth from the streets on a permanent basis had effects on the urban environment that went far beyond the initial health objectives of these reforms.

Water, sewers and garbage collection were all inspired by the public health movement and all three had implications for the city planning movement that was soon to develop. Sanitary reforms generated a "fresh consciousness of the urban setting" (124) and produced the initial attempts at comprehensive city-wide planning. Historian Jon Peterson notes

that while the health effects of sanitary reforms were themselves significant

the importance of sanitary reform transcends these contributions. It also generated a heightened sensitivity to the health consequences of a city's site, and structures. This awareness, while never systematized by sanitarians strongly influenced the proponents of public parks and landscape architecture...- Sanitarians evolved a novel form of health planning based on the sanitary survey...[which revealed] the urban planning potential of sanitary reform...(125)

Efforts at civic beautification that became popular at the turn of the century also owed a debt to the sanitary reforms. The Senate Park Commission in 1902 noted that:

The New Washington would be built upon the previous generation's sanitary achievements...Earlier efforts to plan [the Capitol's] sewerage and landfill [were] key precedents for the beautification efforts...And both had sufficiently resolved the sanitary predicaments of Washington to enable architects and artists to address the city's aesthetic future--its parks, monuments, and building sites.(126)

On a more personal level, the late 19th century efforts to clean up the city resulted in a permanent transformation in residents' expectations of their environment. The removal of human wastes and garbage from the streets, and the reduction of foul odors in the air made the individual experience of the city quite different. We respond to garbage on streets today not simply because it may be

unhealthy, but because it simply does not belong. The image of the good city as the clean city has persisted to this day. Filth is no longer an appropriate or expected part of that vision. At the beginning of the 19th century filth was not thought of. By the end of the century it had become unthinkable. (127)

NOTES

Chapter IV: Environmentalism

- (1) See Kramer, "Agitation for Public Health Reform, I & II;" Lane; Mandelbaum; Warner, "Public Health Reform; and Hammett, all of which deal with the problems of local government and reform efforts. See also Duffy for problems in NYC.
- (2) See Kramer, "Beginnings of the Public Health Movement," p. 363).
- (3) Ibid, 362.
- (4) Weibe, p. 49.
- (5) Benevelo writes: "...the awareness of the discomforts of the industrial town and the protests of its inhabitants existed within an ideological vacuum which left society of the first few decades of the 19th century momentarily devoid of the means to do anything practical about righting the evils which it complained: the old methods were inadequate and discredited, and new ones had not yet emerged.

"From this time on the problem was to fill this void with a series of individual actions, proposals, and laws which could harden into a new logical body of experience" Benevelo, p. 34.
- (6) In addition to Weibe, see as an example, Roth, Chapter 6.
- (7) Rosenkrantz, pp. 6-7.
- (8) Kramer, "Agitation, I" p. 476.
- (9) See Ellis and Kramer, for example.
- (10) Weibe, p. 129.
- (11) For an influential 19C work, see Lemuel Shattuck, Report of Sanitary Commission of Massachusetts 1850, reprinted in 1948 by Harvard University Press.
- (12) Shryock, p. 254. See pp. 254-64 passim.

- (13) Ibid.
- (14) Richmond, "American Attitudes Toward the Germ Theory" p. 431. See also Richmond's "Variant Theories in Opposition to Germ Theory".
- (15) Ibid.
- (16) See Platt's book on Delinquency, for a detailed study of the changing attitudes toward children.
- (17) Klein, and Kantor, p. 298.
- (18) Reprinted in Hodgkinson, Vol II, p. 76.
- (19) Rosenberg, p.216. Rosenberg quotes Boston minister Reverend Frothingham as saying "The remedy of all evils in great cities must be topographical".
- (20) Mayer and Wade, p. 62.
- (21) Bureau of Statistics, quoted in Handlin, p. 102.
- (22) Ibid.
- (23) Mayer and Wade, p. 56.
- (24) See Mayer and Wade for role of transportation in Chicago; Warner's Streetcar Suburbs details the rise of commuting suburbs in Boston.
- (25) Cincinatti Health Officer, quoted in Rosenberg, p. 215.
- (26) Mandelbaum, p. 160.
- (27) Rosen, p. 246.
- (28) Mandelbaum, p. 162.
- (29) See Duffy, pp. 522-539 for detailed discussion of the response to slums in NYC.
- (30) Mandelbaum, p. 162.
- (31) Ibid, p. 165
- (32) Ibid.
- (33) See Nott for an early piece (1847) on life insurance and health.

- (34) Duffy, pp. 227-8.
- (35) Rosen, pp. 450-54.
- (36) Roth, p. 143.
- (37) See John Simon's comments on plumbing in Filth Diseases.
- (38) Mandelbaum, p. 163.
- (39) Roth, pp. 140-143.
- (40) See Klein and Kantor, p. 298, for role of muck-raking journalism on housing reform.
- (41) Ibid, pp. 298 - 300.
- (42) Ibid
- (43) Ibid
- (44) quoted in Rosenkrantz, p. 66
- (45) See "An Act for the Regulation of Tenement and Lodging Houses for the City of Boston" in Acts and Resolves, 1868, Chapter 281 for complete details of the bills.
- (46) From the Massachusetts Bureau of Labor Statistics, quoted in Rosenkrantz, p. 66.
- (47) Warner, Streetcar, p. 30.
- (48) Ibid, p. 33.
- (49) Rosenkrantz, p. 68.
- (50) Bowditch, quoted in Rosenkrantz, p. 68.
- (51) Ibid, p. 69.
- (52) Savings banks were influential in attempting to stimulate housing development. See Thernstrom's Poverty and Progress (Harvard University Press, 1964) for a discussion of the role of banks.
- (53) Rosenkrantz, p. 69. See Massachusetts State Board of Health, 4th Annual Report, "House Accomodations for the Poor in our Most Populous Cities". for a more

detailed account of the Board's increasing interest in housing reform.

- (54) Rosenkrantz, p. 70.
- (55) See Warner, Streetcar, Chapter II.
- (56) quoted in Klein and Kantor, p. 301 - 2.
- (57) Simon, pp. 13-14.
- (58) Ibid, p. 36.
- (59) See Rosen and Tallmadge, "Medicine in Nowhere," CIBA Symposium, 1945, pp. 166 - 200 for a review of the medical content of Utopian Literature.
- (60) Richardson, pp. 10-11.
- (61) Cassedy, p. 220.
- (62) Ibid, p. 223.
- (63) Ibid.
- (64) Richardson, p. 47.
- (65) Cassedy, p. 226.
- (66) Howard, p. 58.
- (67) Howard, see footnote, p. 11.
- (68) Mumford, quoted in Howard, p. 35.
- (69) Howard, p. 111.
- (70) Bowditch, p. 13.
- (71) Ibid, p. 25.
- (72) Ibid, see tables III and IV, pp. 27 - 30.
- (73) Ibid, pp. 43 - 7.
- (74) Ibid, p. 63.
- (75) Ibid, p. 72.
- (76) Noah Webster, quoted in Nelson Blake, p. 9.

- (77) Ibid.
- (78) Blake, N. p. 2.
- (79) Blake, N. p. 3.
- (80) Ibid, p. 112.
- (81) Ibid, p. 173.
- (82) Ibid.
- (83) From the 1853 Report of the Water Commissioners of Baltimore.
- (84) Peterson, p. 7.
- (85) Ibid. p. 9.
- (86) From the NYC Water Commissioners on the occasion of the opening of the Croton Aquaduct. Quoted in Blake, N, p. 144.
- (87) For some of the technical decisions involved in the construction of waterworks and water quality, see Louis Cain, "Chandler, Clarke, Flint, Leffman, Ridell, and Sedgwick (1893). Complete citations may be found in the bibliography.
- (88) Tarr & McMichael, I-2.
- (89) Ibid, p. I-9.
- (90) Peterson, p. 9
- (91) Tarr & McMichael, I-9.
- (92) From the Pennsylvania Board of Health quoted in Tarr & McMichael, I-9.
- (93) Ibid, p. I-20.
- (94) Simon, p. 69.
- (95) Ibid, p. 40.
- (96) Quoted in Blake, N, p. 261.
- (97) Tarr, "Search for Sanitary Order" p. 30.
- (98) Peterson, p. 9.

- (99) Tarr & McMichael, p. I-13.
- (100) See Herring's Report on Sewers in Europe, 1883.
- (101) Tarr & McMichael, p. I-14.
- (102) Massachusetts State Board of Health, Annual Report, 1875. p. 57.
- (103) Tarr & McMichael, p. I-25. See also Ellis, Parts I & II; Odell, and Waring, 1867 & 1882.
- (104) Ellis, p. 350.
- (105) Ibid.
- (106) Tarr, "Combined vs. Separate", pp. 2 - 3.
- (107) Tarr & McMichael, P. I-25.
- (108) Tarr, "Combined vs. Separate", pp. 9 - 11; See also Warner; Streetcar Suburbs, pp 29 - 34.
- (109) Armstrong, p. 433.
- (110) From the Boston Street Committee, Annual Report, 1891. Quoted in Melosi, p. 22.
- (111) Reverend Thompson, Address to the American Public Health Association, 1879, Reprinted in Sanitarian, November 1879, p. 545.
- (112) See Rosenberg, Cholera Years, Chapter XI.
- (113) Melosi, p. 35.
- (114) Ibid, p. 23.
- (115) Armstrong, p. 434.
- (116) From the Report of the Joint Special Commission on the Disposal of City Offal, 1893, quoted in Melosi, p. 28.
- (117) See Odell's "The Sewerage of Memphis"; Metcalf and Harrison, "The Lessons Taught by Early Sewerage Works" and Waring's "Death Rate in Memphis".
- (118) Melosi, p. 60.

- (119) Armstrong, p. 435.
- (120) Melosi, p. 66.
- (121) See Jon Peterson's "The City Beautiful Movement: Forgotten Origins and Lost Meanings". *Journal of Urban History*, August, 1976, pp. 416 - 28.
- (122) CB Crane, quoted in Melosi, p. 112.
- (123) See Armstrong, pp. 447-56, for discussion of some of the technical issues related to rubbish disposal, particularly incineration and land-fills.
- (124) Peterson, p. 11
- (125) Ibid, p. 3
- (126) From the 1902 Report of the Senate Park Commission quoted in Peterson, p. 4.
- (127) The cleaning up of the city radically transformed perceptions and expectations of the city. A new norm of cleanliness was established and universally accepted. Historian Woodward, speaking of Memphis comments that "in the history of the city the year 1880 marks a distinct cultural break...the old Memphis with all its filth was unique; the new city with its improvements was typical" Woodward, p. 137.

CHAPTER V: The New Public Health and Its Aftermath

"I had a 24 hour virus" a young man might say to a friend. A simple statement, but one that expresses a theory of disease that has had revolutionary consequences over the period of its application. That theory of disease--the "germ" theory--clearly has had profound implications for the practice of medicine. Less dramatic and less noticeable, is the way in which it has altered our general understanding of disease, and its relationship to the environment in which we live. The shift in medical theory from one based on "filth" to one based on "germs" altered the focus of public health practice, and with it, reduced its relevance for environmental reform.

The germ theory was neither easily nor quickly accepted in America, with American physicians reluctant to accept it until the end of the nineteenth century.⁽¹⁾ But by the end of the century most practitioners accepted that specific microorganisms caused specific diseases. This contrasted sharply with previously held notions that disease was produced by non-specific environmental influences. Public health professionals, like their clinical colleagues, increasingly turned their attention to the elimination and control of specific bacteriological agents and away from broad environmental and sanitary reforms. As physicians and

public health workers adapted their practice to conform to the standards of the new theory, the objective of cleaning the environment as a disease preventative lost its validity.

Throughout the 19th century, public health and social reformers had worked together. Their objectives were linked. The prevention of disease was not simply a medical or scientific task, but a moral requirement. Reducing the disruptions caused by poverty, by urbanization and by immigration, all were part of the public health program as much as the provision of water supplies, sewers and garbage removal. As the germ theory became fixed in scientific medical practice, these broad social reforms no longer seemed appropriate.(2) Scientific objectives became substituted for moral objectives, and the health reformers who sought professional identification as scientists began to explicitly deny responsibility for social reform.

During the early decades of the 20th century there emerged a strikingly different perspective on the role of public health. The "New Public Health" was virtually a total renunciation of old principles of sanitary reform. Its theoretical roots are in the new scientific theory. Its practical implications had a pronounced effect on public health's traditional reform programs.

Hibert Hill, an influential spokesman for the New Public Health movement, summed up the change:

The essential difference is this: the old public health was concerned with the environment; the new is concerned with the individual. The old sought the sources of infectious disease in the surroundings of man; the new finds them in man himself.

The old public health sought sources in the air, in the water, in the earth, in the climate and topography of localities, in the temperature of soil...in the rise and fall of ground waters; it failed because it sought them, very painstakingly and exhaustively, it is true, in every place and every thing where they were not.

The new public health seeks these sources--and finds them--amongst...infective persons...(3)

Charles Chapin, another leader in the movement, echoes Hill's renunciation of the past. "Science is merely truth systematized," Chapin told his readers, adding that:

Though a distinguished sanitarian has told us that sanitary science must be tempered by common sense, it was spoken in jest. It is not real science, but only the pseudoscience of the amatuer which needs not be tempered, but thrown out, root and branch.(4)

Chapin, Hill, and the other New Public Health practitioners were certain that they, unlike their sanitarian predecessors, would succeed in minimizing disease in society. The optimism that men like Lemuel Shattuck had expressed in sanitary reform at the beginning of the century was now expressed again, but the entire meaning of the social basis for the optimism had been transformed.

Reforms during the 19th century attempted to alter urban environments, both physical and social. An attempt was made to convert a disease-causing environment to a health-preserving one. The efforts of reformers peaked in the last decades of the 19th century, only to see their potential snuffed out by the emergence of the New Public Health at the turn of the century. Suddenly their efforts were dismissed as "largely incompetent, irrelevant and immaterial". (5)

Throughout the 19th century there had been a gradual shift away from personal responsibility for disease toward an environmental cause. By the end of the century, the municipality, not the individual, was responsible for the health of the community. Social and public health reformers worked ardulously to insure municipal acceptance of that responsibility. Yet after the turn of the century that notion was held in contempt by the New Public Health theoreticians, and responsibility for disease again focused on individuals. In 1902, Chapin criticized both the English sanitary reformers, and their American followers in the following way:

The English, who carried the notion of the dangers of filth to the extreme, were considered to be the leaders of public health work, and we [Americans] blindly followed the leaders. Little street was laid on personal cleanliness. It was believed that the municipality was chiefly responsible for infectious diseases.

But with minor exceptions, municipal cleanliness does little to infections or decrease the death rate...It will make little demonstrable difference in a city's mortality whether its streets are clean or not, whether the garbage is removed,...or whether it has a plumbing law.(6)

Continuing Chapin's thoughts, Hibbert Hill told his audience that:

...the modern public health man cares for nothing, so far as disease and death are concerned, for the dirty back yard or the damp cellar...

To locate all the infective persons and to guard all their discharges would be wholly sufficient and is the ultimate goal of modern preventive measures.(7)

The problem with the "old" public health, according to these apostles of the new, was that it tried to control "things" rather than "persons". Sanitary reformers believed that "infectious disease generated in the foul, ill smelling, unventilated, sunless hovels of the slums." Because of that belief they erroneously tried to alter the physical environment of the city, and raise the standard of living of its occupants. These attempts, by the lights of the New Public Health, were all in vain since the "environment has little to do, directly, with the incidence of most of the specific infections."(8) Furthermore, the old problems of overcrowding were not really problems at all. Overcrowding, if done in a manner that is "disciplined and

intelligent," (9) does not at all contribute to the spread of disease. The social cost of environmental control was not worth the possible benefit. Charles Chapin declared that when a health department attempts to interfere with "property rights as it does, and expends so much time and money in nuisance abatement [it] should have some stronger warrant than that it tends indirectly to promote good health."(10) Chapin continued that if communities wanted such amenities as street cleaning, plumbing and housing reform that was well and good--but let the police, not the health department deal with such matters and the control of nuisances. These things were simply not the proper concern of public health workers.(11)

The New Public Health did share one concern with the old--the question of costs. Much as sanitary reformers used economic arguments to gather public support for their programs, so did New Public Health advocates. The argument was somewhat changed. The old public health claimed that its programs brought greater health and prosperity to the city. The New Public Health claimed economy and efficiency:

If the general environment be the great factor in TB [for example] the 100 million people of the United States must each have his or her own environment brought up to and kept at some standard-level to maintain...health.

If, however, the infectiveness of the disease be the great factor, only 200,000 people (the infective cases) need this supervision...and

need it not for their 'general environment' but merely to prevent them from infecting others.

Need anything more be said to indicate the superiority of the new principles, as practical business propositions, over the old?(12)

For the adherents of the New Public Health, all that prevented the implementation of these principles was the public's attachment to the "old wives fables"(113) of the sanitary reformers.

Thus the New Public Health was no longer inspired by the normative vision of the 19th century. Science, professionalism, efficiency and economy demanded trained experts, not the loose coalitions of social reformers, physicians, and sanitarians that had worked together to produce the great reforms of the previous century. Not only did the application of the new theory appear to take morality out of public health, but it denied to social reformers the support that "science" had given them in the past. New health departments needed new professionals, and Hibbert Hill defines their characteristics:

The modern health department needs experts, but not experts in municipal housekeeping, in street cleaning, garbage disposal, smoke prevention, etc. Its experts are the vital statistician, the epidemiologist, the laboratory man...(14)

And so, somewhere between 1900 and 1915 the New Public Health turned its back to environmental reform. Efforts to

reform the urban environment continued--but without the support of public health. Social workers, city planners, and voluntary groups were among those who continued to fight for improvements in the city. While a number of public health professionals continued on an individual basis to work for broad social and environmental reforms, they did so in spite of their discipline's orientation, not because of it. Environmental reformers lost a powerful ally as the New Public Health's ideology achieved professional dominance.

The germ theory seemed to hold unlimited promise at the beginning of this century. Scientists, medical practitioners, and the lay public alike believed that the ancient goal of eradicating or controlling disease could finally be achieved through vaccinations, drugs, or control of infectious persons. Ironically, we now know that the major gains in the battle against infectious diseases were won by the environmentalists not the new scientists and experts of the New Public Health. Rene Dubos, among others, has written of this:

The conquest of epidemic diseases was in large part the result of the campaign for pure food, pure water and pure air, based not on scientific doctrine, but on philosophical faith. It was through [efforts] dedicated to the eradication of the social evils of the industrial Revolution...that Western man succeeded in controlling some of the disease problems generated by the undisciplined ruthlessness of industrialization in its early phase. (15)

In recent years disenchantment with the optimistic promises of the laboratory scientists has set in. The greatest successes have been achieved in the field of diseases that responded to social, economic, and environmental reforms. In contrast, to the acute or infectious diseases which were once feared, the chronic diseases, vascular diseases, cancers, and mental diseases have remained enormous health problems. Increasingly, the cause of these diseases is being linked to the environment once again. Atmospheric pollution, toxic chemicals, improper nutrition, and the stresses of urban life, have all been implicated.

The environment has once again emerged as a focus of health concern. Reminiscent of early 19th century environmentalism there is again an emphasis on the "unnatural" and "unhealthy" nature of modern life, and with it a romantic nostalgia for simpler and purer times. Conservation of the natural environment is important for its aesthetic and uplifting value.

Echoes of the concerns of almost a century ago are heard in this perspective, as citizens are warned of the contamination of their air, water, soil and food. It calls for reform of the manner in which waste products are generated and disposed of, of the workplace, of food supplies, of housing and land-use patterns. It attempts to use existing regulatory organizations to enforce changes,

and to eliminate environmental hazards before they reach individuals. The responsibility lies with municipal, state, federal, or regional authority--not with the individual.

It is difficult to predict what effect this shift in public health interest will have on the physical environment of the cities and surrounding areas. If the vision of public health is once again expanded to see its mission not simply in terms of disease, but as an effort to create a happier and healthier environment, the effect may well be significant, and public health may once again be standing in the "vestibule of reform". Rene Dubos, in one of his many commentaries on the need for a new focus in medicine wrote:

It is not impossible that in the future, as in the past, effective steps in the prevention of disease will be motivated by an emotional revolt against some of the inadequacies of the modern world. In order for public health to fulfill its potentialities it may once more need the help of bold amateurs willing to use empirical methods based on philosophical, humanitarian, and aesthetic beliefs. Medical statesmanship cannot thrive only on scientific knowledge...knowledge and power may arise from dreams as well as from facts and logic. Utopias are often but the memory of Arcadias.(16)

Perhaps the time has come once again for those interested in public health to join forces with others interested in the urban environment--from planners and designers to social reformers and critics--and pursue the image of the city as a healthy and salubrious place.

NOTES

Chapter V: The New Public Health

- (1) See Richmond, "American Attitudes Toward the Germ Theory" and "Theories in Opposition to the Germ Theory" See also George Rosen's History of Public Health; Park on Diphtheria and Typhoid; Landis on Koch's discoveries.
- (2) Rosenkrantz, Public Health, pp. 128 - 82 passim.
- (3) Hill, p. 6.
- (4) Chapin, p. 13.
- (5) Hill, p. 11.
- (6) Chapin, pp. 21 - 2.
- (7) Hill, pp. 13 - 14.
- (8) Ibid, pp. 14 - 15.
- (9) Ibid, p. 15.
- (10) Chapin, pp. 24-5.
- (11) Ibid.
- (12) Hill, p. 19.
- (13) Ibid.
- (14) Hill, p. 25.
- (15) Dubos, p. 130
- (16) Ibid, p. 181.

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