



AN INVESTIGATION OF GOAL-FORM RELATIONSHIPS

by

Selma A. Hershdonfer

B.S. American College for Girls in Istanbul, Turkey
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B.Arch. Carnegie Institute of Technology
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Certified by ...
Thesis Supervisor

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AUTHOR: Selma A. Hershdorfer

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ABSTRACT

This paper investigates goal-form relationships in two ideal city schemes which were put into practice. The schemes are Soria Y Mata's Linear City in Madrid (1890), and the Fourieriste phase of the Brook Farm Phalanx near West Roxbury (1840's). Ideal city schemes are considered to be analogous to planning. Therefore, suggestions about goal-form relationships are derived from these case studies. The case studies suggest that goal form relationships may have two aspects: 1) Those connections between goals and forms which depend on a particular interpretation of the existing situation. These connections vary with the time and the place, or the setting of the plan. This requires the study of factors which determine the interpretation of the existing situation and the influence of these factors upon the choice of goals and forms. And 2) The specific connections between certain goals and forms. These are connections which do not depend on a specific social and cultural context. This requires that possible goal and form types be categorized and specific functional connections between them be analyzed.

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Title: Professor of City Planning

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INTRODUCTION:

The purpose of this study is to investigate the nature of goal-form relationships in city planning. We propose to analyze the extent to which different goals influence the type of planning proposal, and the role of physical form in realizing goals. We shall study the characteristics of other factors which influence the development of goals and proposals and which affect the extent of goal realization. Proposals refer to physical forms or to abstract regulatory devices; they indicate a schedule of action and constitute the plan. Goals are statements of purpose which justify the plan; they indicate the ends sought by proposed actions. Rational planning requires that the nature of proposals be directly dependent upon the nature of the antecedent goals.

Such a study appears to require the detailed analysis of case histories. The goal types and the reasons for their formulation and adoption, the kinds of proposals and the reasoning behind them, the process of plan realization and the extent of goal achievement through the proposals all should be considered and understood.

Which case histories should one select for such an analysis? The large collection of practical plans recently developed in this and other nations could yield many examples, but such material suffers from several shortcomings when considered as source material for this study. Because little time has elapsed since the development of these plans, the student lacks sufficient insight into the specific background problems and situations involved. Results of recent plans are not yet determined. The political context influenced these

actual plans and forced compromises upon them. This process has obscured the nature of the goals and the reasoning behind the proposals. The multiplicity of goals in these plans further tends to confuse the issues.

Examples of "practical" plans from earlier periods are also unsuitable. Though planning may have been practiced, the process was not always deliberate and self-conscious, so that one is faced with a lack of adequate documentation.

For the purpose of this study, the problems of analysis outlined above were avoided by choosing as cases a number of ideal city schemes which were put into practice. Ideal city schemes are defined as those based on speculation and theory, proposing a construction or legislation project, and representing an environment -physical or social- in which the author would like to live. Such schemes contain criticism of existing conditions as well as constructive programs. Ideal schemes which describe a hypothetical society and which direct themselves solely to social and political criticisms and satire were excluded from the group considered. Ideal schemes which were put into practice have adequate documentation. The authors took great pains to explain their goals and proposals and to elaborate their philosophies. When realized, these schemes aroused a great deal of public curiosity. Therefore, many accounts of the experiments were written. The authors of such schemes were single minded and concentrated on one or few goals. This facilitates the process of isolating goals and analyzing their implications.

The analogy between planning and ideal schemes is valid because of the many similarities between them. The differences are those of extent and not of content. The motivation and the approach are similar in both cases. They both stem from dissatisfaction with the existing situation and try to find solutions which will solve all problems. They seek to realize their proposals by controlling and coordinating the actions of all individuals involved. They both seek the ideal. But planning tries to bring the present as close to the ideal as possible while ideal schemes seek to totally replace the present with the ideal. Planning seeks proofs for its position and its method is more rational and systematic. Ideal schemes are impatient with proofs; the strength and clear logic of the proposal is considered proof enough. Planning is more deeply rooted in and restricted by the present. Ideal schemes stay within the bounds of nature and physical possibilities. But they seek to demonstrate other existing possibilities and to show up the existing present as an arbitrary realization of one of these many possibilities. Planning seeks to carefully stage and to adapt the proposal to the existing situation while ideal schemes are more impatient and intolerant of such delays in realization. Consequently, ideal schemes tend to over-simplify the situation, to draw naive correlations, and to idealize man. They are not technical plans but pictures of the ideal final state. However, both planning and ideal schemes base themselves on the analysis of the existing situation. This analysis is used to define the problems and their causes and to develop a proposal which will remedy all ills. The approach in both cases is similar, the differences lie in the method and the

emphasis.

Two ideal schemes were selected for this study. The selection depended on the availability of the material, on whether or not the scheme was realized, and on the type of goal adopted for each case. The schemes studied are Soria Y Mata's Linear City and the Fourieriste phase of the Brook Farm Phalanx. In the first scheme the goals refer directly to the physical form of the city. In the second scheme, the goals refer to social and economic organization.

In this study these schemes and process of realization is summarized. Then the schemes are interpreted in terms of the relationship of events to the goals and the proposals. This involves the analysis of the way in which each scheme was developed and of the factors which influenced each step. Each goal is assumed to have a Field of Influence, which is the area in which the goal would be affective, and to have certain Functional Requirements. Each proposal must relate to these two elements of the corresponding goal. Therefore, the Field of Influence and the Functional Requirements of each goal are defined, and when possible, graphically represented. They are compared to the final proposal as a demonstration of their relations to the goals. A series of diagrams illustrates the analysis.

THE LINEAR CITY:

Arturo Soria Y Mata was the director of the City Railway company in Madrid. He was interested in modern means of communication and in other applications of the technical discoveries of his time. Mata had been active in the introduction of the streetcar into Madrid and had invented a number of improvements on the telegraph. His attempts to have a telephone system established in Madrid had failed. In the 1880's he started writing articles for the newspaper El Progreso which was devoted to administrative reform. In these articles he developed his ideas on the design of cities. These ideas were then incorporated into the concept of the Linear City. (1882-83)

Analysis of Existing Conditions:

According to Soria, existing cities were point cities or radial cities which were a modification of the point cities. These cities were very centralized. Employment areas and public facilities were concentrated and the road system was designed to enforce this centralization. This pattern was developed around the needs of a mode of life different from the existing one. These cities were designed to serve a smaller population and to use slower and more primitive means of transportation. The main characteristics of modern life was the sudden and excessive growth of cities due to industrialization. People from rural areas migrated to urban areas. They were attracted by the employment opportunities in the cities. This outmigration from the country caused a deficiency of labor in rural areas and decreased the productivity and economic strength of these areas.

Existing cities were unable to expand and meet the demands of the increasing population. The excessive demand for the centralized services and locations most accessible to them lead to excessive speculation. Land values tended to form concentric rings about the center. Roads proved insufficient to satisfy the new demand. Their pattern was unsuitable for the use of modern and more efficient means of transportation. At the time, the street railway was the most modern and efficient mode of transportation. The existing streets were too narrow and too devious to allow the effective use of the streetcar. Congestion and overcrowding became the characteristics of existing cities. Except for the few rich, people lived in unhealthy and miserable housing conditions. The number of mental disorders, tuberculosis cases, alchoholism, and crime had increased. Sunlight and fresh air, "the inheritance of all people"¹, had become a commodity most people could not afford.

To solve these problems, a new concept of city design which would channel the expansion of old cities and integrate them into a new urban pattern had to be developed. The application of this concept would transform the urban and rural areas; the deserted countryside would be revitalized, and the existing conditions of city life would be improved. This new concept of city design should be economical, applicable to all places, and of benefit to all social classes. It should eliminate misery, be based on the equitable division of real estate, and spur the development of rural areas by bringing capital, industrial activity, and stable work to these areas. It should contribute to the progress and development of all places and help the cause of happiness and peace in the world.

Principles of City Design:

The new concept of city design is based on a number of principles. These were dictated by the existing problems of cities and the needs of the people. According to Soria, the problems of building cities derives from problems of locomotion. He assumes that surface transport is the "basic organizational factor in modern living, therefore, we must arrange ourselves and our activities along its routes."² The quickest and most economical means of transportation should be provided to serve the needs of the people. The most efficient means of transport at the time was the street railway. Soria observed that new sections of cities tended to arrange themselves along the railways. He supported this point with an analogy between cities and living organisms. The organs of superior animals are arranged according to principles of efficiency. Such animals are distinguished from the lower animal forms in that they have vertebral systems. Hence, "The most perfect city form must exhibit the same symmetry, differentiation, and progression as the forms of the higher animals."³

The plan of the city must precede construction. Thus, the city would be designed more rationally according to the existing demands and conditions. The geometric forms of streets and blocks must preferably be regular because regular forms are more beautiful, more workable, and more economical. They are more beautiful because the forms of higher animals also are regular and the vertebral system is composed of basically straight lines. They are more workable because transportation and utility lines have been observed to be more efficient when laid out in straight lines and regular patterns. They are

more economical because the perimeter of a regular shape is shorter than that of an irregular shape of the same area. Moreover, since the shortest distance between two points is a straight line joining them, they are more efficient in terms of distance as well.

Only one fifth of the land should be built upon. All housing should be detached and have windows on all facades. These regulations would insure adequate spacing among the houses and allow for proper ventilation and exposure to sunlight. It would be less expensive to build party walls between houses, (attached housing), instead of building individual walls for each house, (detached housing). The spaces between buildings would safeguard individual properties against fire spreading from neighboring houses. This fire protection would balance the added expense of building detached housing. All buildings must be setback from the streets at least five meters. This would make the area more pleasant and also would allow for future widening of the streets.

These new cities or extensions of old cities should fit into the landscape between old point cities. Thus, they would join old centers with efficient means of transport and impose on the countryside a pattern of triangulation. The new cities would form triangular enclosures containing rural areas. Old cities would form the apices. The capital and industrial activity of cities would be brought near the raw materials and the labor supply of rural areas. At the same time industrial areas would become accessible to market areas. This would spur the economic development of rural areas. Such a system would be useful not only in older and already populated

countries, but would also stimulate the colonization and development of new and undeveloped countries.

In this system of triangles, land values would be highest at points immediately adjacent to the streetcar routes and decrease toward the peripheries. The settled area would be confined to a band along the central streetcar route. All locations would have good access to the streetcar route. Thus there would be no reason for crowding into small and limited areas due to the centralization of the facilities. At difficult points of the landscape, the Linear City should either get narrower, or consist of the central road only. The central road may remain on the surface, go through a tunnel or over a bridge, depending on the particular conditions.

The new city pattern should reverse the movement from country to city and stimulate a return to nature. In the new cities land should be distributed equitably. It should make all men happy by providing "To each family a house; to each house a garden to cultivate."⁴ People could grow most of their food in their own garden, and own property and land. This would lead to a more contented and stable society.

Proposed Scheme:

Soria Y Mata coordinated these principles into his concept of the Linear City. The Linear City was organized along a wide central avenue containing a streetcar line. Cars, bicycles, animals, and streetcars would each have separate rights of way. Streetcar rails would carry passengers during the day and freight at night.

The central avenue would be well paved and planted with four, six, eight or more rows of trees. There would be benches for pedestrians at regular intervals. Conduits of water, light, telephone, etc. would be laid under the pavement. This street would be forty, sixty, or 100 meters wide. It would be intersected by twenty to forty meters wide transverse streets at regular intervals. These intersections would be designed as pleasing public squares. Each square would have a different shape. There would be a small kiosk with a police station, a comfort station, a cafe, public telephone, and a streetcar stop at each intersection. The main avenue would be flanked on either side by ten to twenty meters wide boundary streets. All these streets would be paved, landscaped and provided with utilities. All the streets would be straight. The Linear City would be of indefinite length. The area accessible to public facilities and to employment centers would be large enough to satisfy the demand. There would be no need for crowding into central locations.

The city blocks would be rectangular or trapezoidal. Both of these are regular shapes. They would be 100-300 meters long along the central avenue and 100-1000 meters long along the transverse streets. All lots would be 400 meters square. Buildings along the central avenue would be the largest. These would be built on a minimum of three lots. The largest buildings would be located along the transverse streets and be built on two lots. The smallest buildings would be built along the boundary street and

require one lot. There would be a five meters setback on the main and transverse streets and a three meters setback on the boundary streets. All houses should be detached and have windows on all four sides. Land coverage would be a maximum of one fifth. Building height would be limited to three storeys. Each house would have its own garden.

The system of zoning by lot size would allow the rich and the poor to live close together and enjoy the same public facilities. Land values would form a triangular prism with the apex along the central avenue. Both the rich and the poor would be able to own property in the Linear City. Lots would be sold and houses built for cash. Or, the buyer may make a twenty per cent cash payment and pay the rest in equal monthly installments in twenty years. Nine per cent interest called rent would be charged over this period. Laborers and employees would be able to own land and enjoy a healthy environment in this system. This would help reconcile capital and labor and lead to a more stable and happy society. Controls over the actions of individual owners would be incorporated into each title. This would prevent any changes that might be detrimental to the neighboring properties in the future.

Linear Cities would channel the growth of older cities and connect old cities. Eventually the country would be covered with a system of linears called triangulation, as explained earlier. Soria visualized the whole world as covered by this system, ". . . extending if necessary from Cadiz to St. Petersburg, from Peking to Brussels."⁵ This system would stop outmigration from the country

by bringing the advantages of the city to the country. Centers of production and of consumption would be joined and factories would be enabled to enjoy municipal services, access to markets, and access to raw materials at the same time. The penetration of rural areas with urban fingers would bring about the reforestation, drainage, and irrigation of the countryside. These factors would stimulate the economic development of the countryside.

The concept of Linear Cities ought to be adopted by official departments at a national, regional, and municipal level. A public agency which would administer the program and stimulate private enterprise should be established. Laws regarding the extension of cities, building of new cities, colonization and repopulation of rural areas should be formulated. Industrial companies would then take on the task of building new cities. Such companies should be given powers of eminent domain and protected from the egotism and bad intentions of others. Such companies should be declared public utilities because their work would be in the public interest. Concessions for building and operating transport facilities and other utilities should be given to these companies. The state should guarantee the mortgages and other financial obligations taken by these companies in their efforts to help the public.

The Building of The Linear City in Madrid:

In 1883 Soria Y Mata ceased writing for El Progreso. During the year 1886-87, he sold his interest in the streetcar company.

His dissatisfaction with the excessive conservatism of the other directors lead him to resign. He moved to a residence near the tract of the future Ciudad Lineal of Madrid and devoted himself to the realization of his idea.

In 1892 he made his project publicly known. He proposed to build a linear city encircling Madrid at a radius of seven to eight kilometers from the city center. The Linear City were to join a number of suburbs. The proposed city would be fifty-five kilometers long. It would pass through undeveloped, dry and unproductive land surrounding Madrid. It would join a number of small and old cities. These cities had become suburbs consequent to the expansion of Madrid. His proposal deviates from his original concept of a Linear City and a system of triangulation because, instead of forming triangular enclosures, it proposes to form a circle around Madrid. And, it joins suburbs of a city instead of two or more cities as stated in his theory.

Soria's efforts to interest investors in his scheme met with little success. His idea was found to be unrealistic and sure to fail. The main criticism was directed at his idea to build a street-car line through undeveloped territory. However, in August 1892, he obtained the concession to build the streetcar line. He managed to interest a small group of enthusiasts of limited capital. In 1894 they founded the Compania Madrilenia de Urbanizacion -(C.M.U.). They were immediately faced with problems of land acquisition. The value of the land on the proposed site of the Linear City had risen after the publication of Soria's plan. Moreover, the land was subdivided

into a great many parcels. "To secure the land for the first section of 5,200 meters, (they) had to buy from more than one hundred owners".⁶ Due to financial difficulties and lack of government aid in land acquisition, the C.M.U. was able to build only five kilometers of the projected fifty-five kilometers long Linear City. The course of the city had to be adjusted to take advantage of cheaper land. More land was later bought, but, this land was never developed into a Linear City.

In May 1897, the C.M.U. declared their aim as being the realization of Soria's proposal of 1892 - the creation of a hygienic and comfortable residential area combining advantages of country life with proximity to business centers and other necessities of urban life. The housing was to be within the economic means of all social classes. They also aimed to develop all the public utilities necessary for the project. The C.M.U. engaged in many enterprises including buying and selling lots, building, the manufacture and sale of building materials, supply of water and light, the establishment of streetcar lines and of other means of transportation. They engaged in the building and sale of housing in Madrid at locations other than the Ciudad Lineal, owned and operated a number of street railway lines not connected with their main enterprise. Their character between a public-utility and a money-making-enterprise was never clear. This may be why the government never declared them a public utility which would have given the C.M.U. privileges of tax exemption and the power of eminent domain. Or, this very lack of power and security may have been the cause of their various activities.

As built, the Ciudad Lineal contains a central avenue 120 feet wide with a double streetcar line in a separate right of way. The streetcar line is screened with pine trees and flanked with carriage ways on either side. The standard building block is 240 feet wide and 600 feet deep. Transverse streets are forty-five to sixty feet wide and also planted with pine trees. The two boundary streets have not been built consistently. The C.M.U. sold the land, built the homes to a variety of designs, supplied water and electricity, and operated the streetcars. Building was strictly supervised. Only one-family detached housing was allowed. The land coverage of one fifth was not too strictly observed. However, the density is still low, averaging 3.16 houses per acre.⁷ The C.M.U. established an installment system for the payments. The buyer would receive a ten per cent discount for buying with cash. Otherwise a twenty per cent cash payment would be made and the rest paid in equal monthly installments over a twenty year period. Nine per cent interest, called rent, was charged during this time. Title would not pass till payments were complete. Cases of arrears were dealt with harshly. Land and all the payments would be forfeited after nine months. This period would be reduced to six months in case failure to pay was due to a death in the family. The house, however, was forfeited only after fifteen days.⁸

The low density together with the landscaping gave the Ciudad Lineal an atmosphere very different from the rest of Madrid. A 1926 American tourist guide referred to it as a "large park"⁹. A guide to the Ciudad Lineal published in 1931 listed the names and

addresses of the residents. According to this list, nineteen per cent were from the aristocracy, the church and the professions; four per cent were writers, artists, and musicians; eight per cent were skilled workers; and sixty-nine per cent were in "humble employ."¹⁰ This shows a rather fine mixture of income and of social classes. Even though no statistics are available, the Ciudad Lineal was pointed out as having a death rate much lower than that of Madrid. The children also were found to be healthier. "The C.M.U., . . . , has created the most beautiful suburb of Madrid and made a real contribution to the cause of better health and better housing in Spain."¹¹

The C.M.U. engaged in a wide publicity campaign to gain support. They published a periodical, La Ciudad Lineal, and participated in international congresses on housing. They met with enthusiastic interest in these international contacts. In Madrid, between 1900-1910, they met with success. They built the first electric streetcar in Madrid. This streetcar maintained its popularity until the 1930's. The Spanish royal family visited the Ciudad Lineal, and the first airport in Madrid was built near-by. The first world war brought financial troubles. But in the post-war boom the enterprise recovered. Soria Y Mata was ruling the company almost single handedly. Factions in the C.M.U. developed and attempts to, as it were, depose Soria were made. However, he managed to keep control of the enterprise. In November 1920, Soria died, and his son took over.

By 1925, the C.M.U. had become financially successful and the

center of an international movement for the planning of linear cities. In 1924 it was almost realized in Chile had the political situation not changed. Also in 1924, it was brought to the attention of the League of Nations by Georges Benoit-Levy. In 1928 Benoit-Levy founded the International Association of Linear Cities. This activity helped maintain the C.M.U. through the civil war in Spain. In 1931, the strike of the typographers caused the company to stop publishing La Ciudad Lineal. The company's railroads were sabotaged and the state refused to pay for the damage. In 1934 they abandoned the construction of houses. The company rented some of its railroads to a semi-municipal agency. In 1936, the director, Soria's son, was killed. The remaining son sold the company out of the family. The new owners first sold part of the street railroads and then sold the remains. By 1950, the company had practically dissolved itself.

At the present, the entity of the Linear City is quickly getting lost. It is being swallowed by the expanding suburbs of Madrid. The richer inhabitants have left for newer and more fashionable residential areas. Consequently, the area is no longer socially mixed. The decline of the popularity of the streetcar has in a sense marked the decline of the Linear City which was based on streetcar transportation.

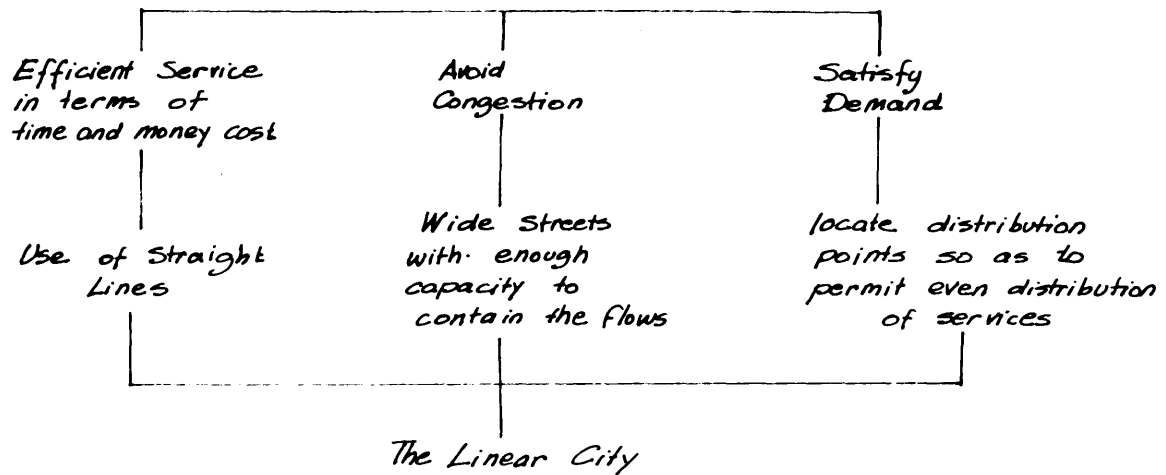
ANALYSIS OF GOALS AND FORMS IN THE PROPOSED LINEAR CITY:

Soria Y Mata had three general goals for the Linear City. Each one of these was developed by defining the area affected by the goal -or its field of influence - and by investigating the specific requirements of each goal. These were then translated into physical forms. The physical forms, in this case, refer to the physical facilities - such as buildings, streets, utility and transport lines, landscaping and the land itself, and to the pattern of activities taking place within these facilities.

The first goal is to provide the quickest and cheapest mode of surface transportation. The choice of this goal reflects Soria's personal interest in the street railway and other technical discoveries. It reflects the intellectual climate as the refinement and application of these discoveries was characteristic of the times. Soria's experience as the director of the railway company appears to have influenced his assessment of the nature of the problems leading to the formulation of his goal. He had observed that in centralized cities, the transportation system was congested and the service did not satisfy the demand. The outdated street pattern was unable to fulfill the needs of modern cities. The streetcar was the most advanced form of surface transportation at the time. However, the design of the city with a narrow and devious street pattern made it impossible to establish enough streetcar lines to satisfy the demand or to travel fast enough to serve a larger number of people in a short time.

This goal affects the design of the circulation system. The

Goal I: Providing the Quickest and Cheapest Surface Transport.



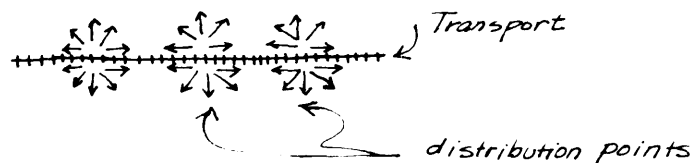
Field of Influence: Design of the Circulation System

Requirements: Least time and money cost
(i.e. shortest distance and smallest perimeter)
Do not overtax system - satisfy demand
Avoid Congestion

Existing Form:



Proposed Form:



circulation system constitutes its field of influence. The next level of goals specify the requirements or specific needs of the goal. They define the conditions that the proposed solution should satisfy. These are: economy in time and money, satisfaction of the demand, and avoiding congestion. These were determined by observation of the existing conditions and of their affects. Common sense correlations were drawn between them. The proposed solution, The Linear City, appears to be a contrast to the existing form. These correlations are reflected in the proposed policies for action. The use of straight lines are advocated because the shortest distance between two points is a straight line joining them. This would mean that all conditions being similar, a streetcar would reach its destination from a given point faster by a straight line route than by a curved line route between these two same points. Congestion would be avoided if wide enough streets are provided. The capacity of the street to hold traffic is determined by its width.

The distribution points, or streetcar stops, were located at even intervals serving an approximately equal number of houses. Or, each stop served an area of a given radius. No clear reason is given for the choice of this radius. It can be assumed that if the number of houses representing the demand for a given stop, or portion of the transport system, were increased, the demand for service would also increase. And, the transportation system designed to satisfy a given demand would be overtaxed. Therefore, the distribution of the stops and the density of the houses should be controlled to insure effective service.

Soria's knowledge on how streetcars work best and the mathematical postulates on the characteristics of the straight line influenced the nature of the proposed form. Even though it is true that a straight line is the shortest distance between two points and wide enough streets would eliminate traffic congestion, there is no proof offered that the proposed solution is an optimum solution. It may or may not minimize travel time and distance. If the aim was to connect old centers, the form might indeed be an optimum. But, as an extension of Madrid, the Linear City does not seem to minimize travel time or the distance to the center. If such were the case, straight line connections between the old centers and the center of Madrid might have been more effective. Such a system would have led to a radial pattern.

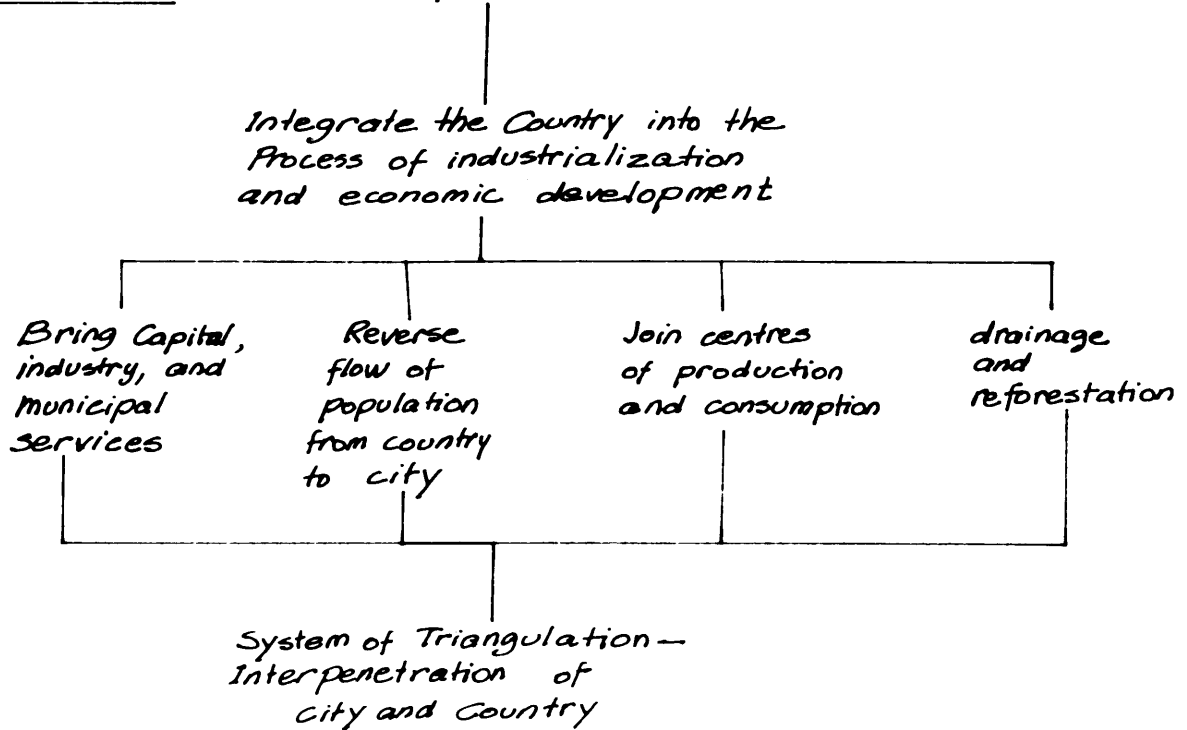
The form chosen was further justified by the analogy between cities and the higher animals. This seems to be a rather irrelevant analogy as the conditions in the higher animals which are satisfied by the vertebral organization are fixed and, for all practical purposes, are predictable. In cities, the conditions - here the use of the streetcar - are subject to change. Not only does the demand change but the streetcar itself, and hence its requirements for proper functioning, also may change. Another difference is in the function of the vertebra as compared to the street pattern. An analogy with the distribution of the blood vessels might have been more appropriate. The adoption of the vertebral diagram without any modification appears to have made the system inflexible. The fish-bone pattern developed from the analogy was based on the repetition

of identical units, indefinitely. There was no differentiation between one part and the other. This made the Linear City monotonous.

The second goal is the development of rural areas. The solution proposed for this goal is a systematization of the solution proposed for the first goal. This goal reflects the existing economic conditions. It is based on the comparison between the conditions in cities and in rural areas and on the assessment of the effects of the industrial revolution. In that respect, this goal reflects a widely recognized condition of the times. This goal affects the functional relationship between rural and urban areas. The economic assets of rural areas need to be preserved and cultivated. Soria's statements, such as "stopping outmigration due to hunger", and his concern with the development of rural industries imply that at the time people were aware of a decline in agriculture. Consequently, those who could not find jobs in the country, and those who were attracted by the promise of a better life and more jobs in the city migrated into urban areas. This event reduced the rural labor force, further weakening agriculture.

Soria proposed to integrate rural areas into the process of economic growth by stopping the loss of resources from the country and influencing a cooperation and sharing of resources between rural and urban areas. He proposed a system of triangulation in which city and country would be interpenetrated. This proposal was based on the assessment of the requirements of the goal by observation, research, and comparison. The form proposed is an application of the solution

Goal II: To Develop Rural Areas



Field of Influence: Relation of country to city with respect to the economic functions of each

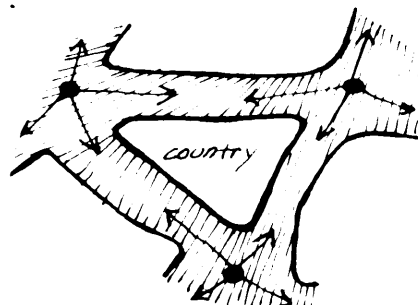
Requirements: Sharing of facilities between city and country
Access to raw materials (in country) and to markets (in city).

Existing Form:



intraverted cities

Proposed Form:



extraverted cities

developed for the first goal. It also appears to contrast the existing conditions. The pattern aims to increase the accessibility of rural areas. Increased accessibility would stimulate the provision of better services and the location of industries in rural areas. This result may have been achieved in ways other than triangulation. The linears may have been arranged in squares, hexagons, etc. The choice of the triangles are not justified by Soria and may have been arbitrary.

The solutions for the first and second goals seem to supplement each other both in formal pattern and in intent. The triangles consist of linears described by the solution for the first goal. The first goal aims to provide the quickest and cheapest mode of surface transportation. This goal, when fulfilled, would contribute to the achievement of the second goal. The second goal requires provision of access to raw materials and to markets, or joining of centers of production and consumption. It would seem that the provision of quick and cheap transportation between country and city and between neighboring cities would increase accessibility between these points. For these reasons, the results of the solutions proposed for these two goals and their role in achieving the goals will be analyzed together.

Whether or not Soria's ideas were valid can be assessed by analyzing the results of the partial realization of his scheme. He proposed to join a number of old centers surrounding Madrid with a Linear City. This would develop the unproductive lands around Madrid and give the city a planned direction for growth. It would also

satisfy the demands of the growing population. Only a small part of the scheme was realized. Therefore, the wider implications of his ideas, such as those referring to economic development and social stability, cannot be assessed. The relation of the linear city scheme to the well-being of the inhabitants, to opening up new land for development, to the application of modern technology, and the validity of design criteria such as the need to coordinate the form with the mode of transport and the necessity for planned city growth may be analyzed.

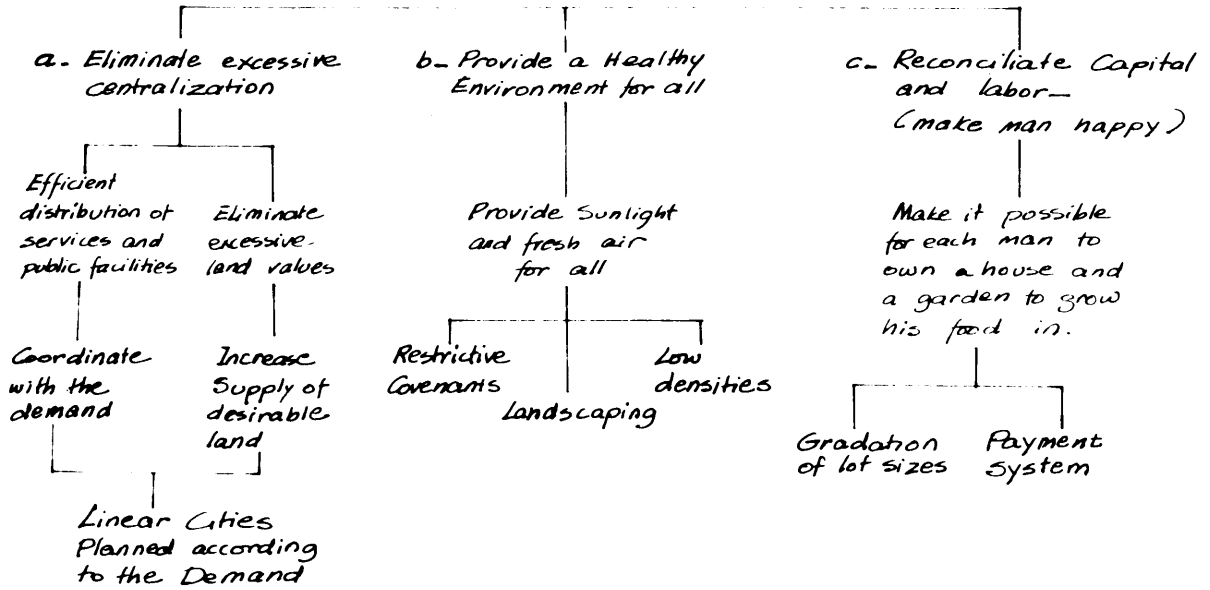
The project demonstrated the validity of the idea that city forms should be coordinated with the mode of transportation. The new streetcar lines made new areas accessible and increased the supply of desirable land. This lowered the land values, enabling more people to afford proper housing. The speed and ease to travel from one place to another shortened distances and contributed to the increased accessibility. The success of the Linear City in attracting people to live there may indicate the validity of the pattern developed by Soria to satisfy the requirements of streetcar transportation. However, there is no evidence indicating that it is the only pattern that can do so. The acute shortage of housing said to exist at the time in Madrid may have influenced the success in populating the Linear City. The demand may have been so great that irrespective of accessibility, people may have wanted to live in the houses provided by the C.M.U. In this case, however, the social mix that was achieved would not have occurred. Probably, the existing demand together with the degree of effectiveness of the system helped

populate the Linear City.

The success of the Linear City as a suburb of Madrid indicates that it was successful in opening new land for development. The activities of the C.M.U. "transformed bare and unpromising land with irrigation and planting"¹². The success of the Linear City pointed out that the criticism of the overly conservative authorities condemning the project as unsound because it proposed to bring services to an undeveloped area was misplaced. The project demonstrated that services need not follow people but that people would follow the services. It may be said that the Linear City helped open the way to the development of new suburbs around Madrid. The form itself was not the only agent in achieving this effect. The C.M.U. as the implementing agent contributed a great deal. However, this result indicates that Soria's analysis of the conditions - such as provision of access, services etc. - for the development of new territories was sound.

Soria's proposal for Madrid planned to join the existing old centers which had become suburbs of Madrid with a Linear City. This would form a fifty-five kilometers long belt around Madrid. This proposal seems to be a deviation from his system of triangulation. It may be that he considered each old center as an apex of a triangle. With time, as the city grew, more linears would spring up from the apex and join each old center with another. Thus the proposed belt would be a beginning for a system of triangulation. On the other hand, he might have proposed to connect Madrid directly with another city. Distance may have been a forbidding factor for such a scheme. The failure

Goal III : To Improve Existing Conditions of City Life



Goal III - a: Field of influence: Design and location of services and public facilities
 Pattern of land values - or access characteristics of area

Requirements: Even distribution of services
 Extended area of valued land

Existing Form:



Centralized
 Congested
 Poor servicing for outlying areas

Proposed Form:



to start a system of triangulation right away may have influenced the extent to which the goal of developing the countryside was achieved.

The third goal is to improve the existing conditions of city life. The choice of this goal indicates Soria's response to a problem not widely recognized. He himself had lost a child because of unhealthy living conditions. As he admitted, this experience stimulated him to be concerned with the living conditions in the cities. This goal had three aspects: To eliminate excessive centralization, to provide a healthy environment, and to reconcile labor and capital. The first aspect referred to the quality of services and to the pattern of land values. The even distribution of services and elimination of high land values was needed. The whole population would be able to enjoy the services and would be able to have a wider choice of where to live. The proposed solution was a reverse of the existing conditions. It satisfied the demand and increased the supply of desirable land. This form is based on the analysis of the existing situation. The connection of the form to the goal is one of common sense correlation.

The second aspect of this goal is the provision of a healthy environment. The field of influence is the design of residential and industrial areas. The requirements are based on comparing the unhealthy areas with healthy ones. The solution aims to replace the conditions in unhealthy areas with those found in healthy areas. Soria found that the rich were healthier and that areas where the rich lived had lower densities than the residential

areas of the poor. Therefore, he proposed low densities as a solution for the goal. This proposal would be supplemented by planting. Soria believed that "trees were the lungs of the city."¹³ Plants whose leaves contain chlorophyll convert the materials they absorb with water into food, or starch, through a process known as photosynthesis. This process absorbs the carbon dioxide, deemed harmful to humans, from the air and give off oxygen, deemed healthy. Soria's belief stemmed from this fact. Restrictive covenants would help maintain healthy conditions by preventing the individual owners from increasing the density of the area.

The third aspect, the reconciliation of labor and capital, reflects a widespread concern of the time. Soria adopted Henry George's phrase, "to each family a house, to each house a garden to cultivate"¹⁴ as his motto. He believed that owning property and having enough food to live on, even if one has to grow it oneself, would make man happy and lead to peace and stability. His observations and research indicated that the goal required the provision of property suited to everybody's paying ability and the adoption of payment system favorable to the working man. The laborer would thus become a landowner, or a capitalist. As such, he would want to protect his vested interests against changes. He would become a conservative. Thus both the capitalist and the laborer would cooperate in preserving peace and social stability. This assumption seems to be an oversimplification. It overlooks factors other than material wealth that may cause social conflicts. The solutions Soria proposed for these two subgoals are modifications of the existing

Goal III-b.: Field of Influence: Design of Residential and industrial areas

Requirements: Spacing to allow passage to sunlight and fresh air

Existing Form: High density at center and low at perimeter, only outlying areas healthy



Proposed Form:

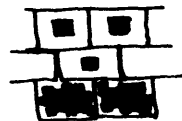


spacing according to size of building

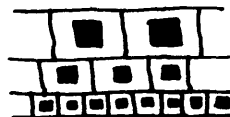
Goal III-c.: Field of Influence: Distribution of land and possibilities to own property

Requirements: Provide varied sizes of land and bldgs. to suit everybody's economic capacity.
Adopt an easy payment system.

Existing Form: Large holdings, High prices, only rich can afford to buy, poor have to concentrate and share cost of land



Proposed Form: Installment payments and Gradation of lot sizes



conditions. They do not deviate significantly from the existing pattern and are not as inventive as the solutions for the first and second goals are.

Reports indicate that better health was achieved in the Linear City. This may imply that light and air were conducive to better health. However, it does not mean that low densities are the only way of providing light and air; nor that health depends solely on light and air. Low densities are only one way of providing adequate light and air. Apartments and row houses may be so planned as to also fulfill these needs. Soria's choice of low densities indicates the limits of his research and the extent of his knowledge about the requirements of this goal. There were other factors which influenced the realization of this goal. These were the provision of food and shelter. This necessitates that the population exhibit a certain economic capacity and a desire to rise socially. The careful screening of the buyers and the strict controls to insure payments indicate that this economic capacity and social attitude did exist in the inhabitants of the Linear City.

The C.M.U.'s methods of selecting buyers and collecting payments indicate that the company did not really intend to help all people. It appears that the C.M.U. helped only those who could help themselves. The plan did not provide for the establishment of new employment center or of shopping areas even though it did try to decentralize public services -i.e. utilities and transport. The Linear City appears to have been a dormitory suburb. As such it only decentralized residential quarters. The dependency of the Linear City

on the neighboring shopping facilities and employment areas would enforce the existing centralized pattern of these activities instead of decentralizing them. The migration of the richer population out of the Linear City in the 1930's to a certain extent may have been due to the lack of conveniences in the Linear City.

Soria, in his principles of city design, also pointed out that cities should be designed to allow for future growth and that the design should be applicable to all places. These appear to have acted as constraints upon the forms he developed. The Linear City was to extend indefinitely. Thus it could grow indefinitely. The services could be extended together with the road with no difficulty. Except, Soria did not plan for employment centers. Perhaps he considered that old center would serve as employment centers. The Linear would stop when it arrived at another old center and a new Linear start developing from the other side. In case no old centers existed, the apices of the triangles would serve as employment centers.

This goal stemmed from his observation and analysis of the existing situation and the requirements of the city for proper functioning. The solution is an oversimplification. It overlooks most of the functions of the city and concentrates on the need to expand the residential areas. It tends to suggest a city consisting of the endless repetition of identical units intercepted at more or less random points by other such cities. This picture seems quite monotonous and unideal.

The system had to be applicable to any place on earth. Soria seems to have overlooked the difference in climate and resources and

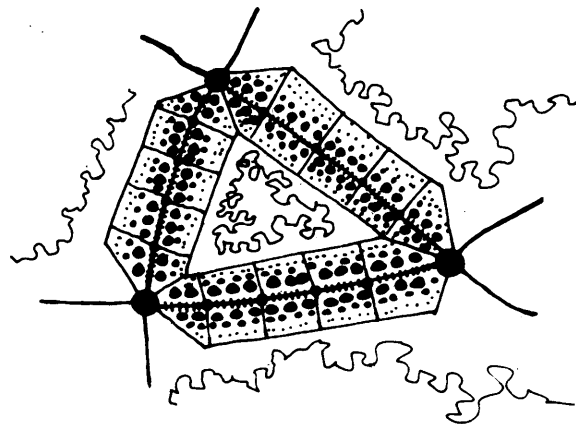
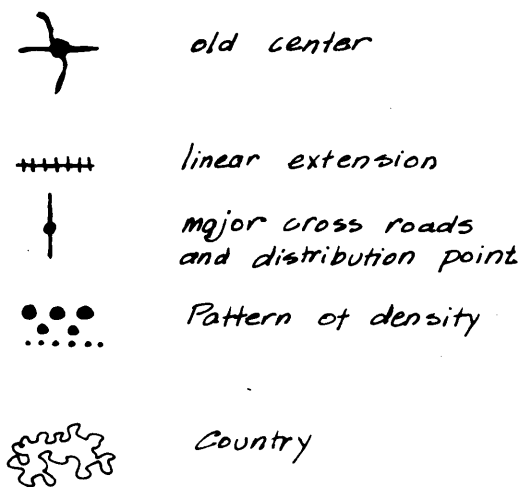
to have concentrated on the topographical difficulties. He recognized certain modifications of the linears in order to solve problems of topo. He proposed that the Linear City may be narrower while passing through an especially narrow ravine, and even be reduced to the road only. In case of high mountains, the road could pass through a tunnel, and in case of cliffs or other chasms, it could go over a bridge. Thus the straight line would be maintained. This goal also is based on observation and analysis. The solution proposed is very limited and overlooks many other possible problems. In effect, the one adaptation the C.M.U. had to make was to change the course of the linear in order to take advantage of cheaper land, a problem not foreseen by the theory.

All of these goals appear in the final proposal for a physical form. The first one is seen in the individual linears; the second, in the general pattern, and the third in the density pattern, the landscaping, and so on. The only proposals which did not appear in the proposed form are the restrictive covenants and the payment system. These proposals are implementation devices and their influence upon the physical form is indirect. The restrictive covenants help maintain the density pattern. The payment system, to some extent, influence whether or not certain areas of the city are built at all. These proposals seek to control actions which are directed at people. These may or may not reflect on the physical form. The other proposals seek to control actions which are directed towards physical objects.

The final proposal indicates that the individual proposals

Proposed Solution:

a: Physical Form:



b: Regulatory Devices:

Restrictive Covenants
Payment System

derived from each goal were additive and did not conflict. The first goal, the Linear City form, had priority over the others. As such it defined the specific forms of the other proposals. The ideas and information supporting the form proposals do not necessarily indicate their specific shape. The countryside may be developed to satisfy all the requirements of the goal without the pattern of triangulation. For instance, satellite towns may be built joining to the main cities with highways. Or, factories etc. may decentralize and locate in rural areas maintaining only transportation connections to cities. In the third goal, the gradation of lot sizes, the landscaping, and the low densities have nothing to add to the linear city form. The building of the facilities may be coordinated with the demand and the supply of desirable land be increased in ways other than the Linear City. For example, a completely suburban and dispersed city, such as the garden city, may be built. Moreover, healthy environments may be maintained at high densities as well as at low densities and fresh air supplied without trees to serve as lungs of the city. That Soria chose to incorporate all his other goals into the form developed to satisfy the requirements of his first goal may indicate that this goal had priority. In his statements of principles, the need to coordinate with the transportation patterns is stated before all others. One of his main achievements had been the establishment of streetcars in Madrid and for along time he had been the director of the street railways in Madrid. These factors make it likely that his first goal had priority over the others.

From his analysis it appears that the basic goal was the provision of the quickest and cheapest mode of surface transportation. The other goals were adopted to demonstrate the advantages of the Linear City form and the value of his proposals to remedy many of the recognized problems of his times. In this system, the physical form performs a key function in fulfilling the goals. It is the main means of realizing the goals. The form performs this function by fitting the requirements of the activity pattern, and by giving a direction to the flow - i.e. transportation, flow of goods, migration etc.

The success of the Linear City did not last long. The eventual decline of the city appears to have been influenced by all the proposals collectively. It is very difficult to point out any one of them as the cause of the specific events. The richer population moved out to further suburbs and the Linear City now is getting lost in the growing Madrid. This may be traced to the monotony and excessive length of the form. It appears inconducive to personal identification with the area and to the formation of community life. At the International Cities Congress at Ghent in 1913, the C.M.U. evaluated its experience. They found that the Linear City was too long and monotonous. They said that the Linear City needed differentiation of the parts in term of the uses, more consumers' services, and a buffer zone along the two boundary streets. The Linear City was planned only as a suburban extension and not as a self-sustaining city. As already mentioned, it lacked many of the necessary services such as shopping, and forced the inhabitants to

be attracted to places outside its boundaries. Also it was not physically protected from the surrounding developments. The form was too rigid and an oversimplification. This made it inflexible and unadoptable to new conditions. It was too dependent on the streetcar. The decline in the popularity of the streetcar and of the Linear city seem to be correlated.

Comments:

The study of the Linear City indicates that physical forms influenced the realization of the goals in various ways. The location and distribution of services and of facilities appeared to affect the direction of growth and extent of development of the area. In turn, the specific requirements and formal characteristics of the facilities provided influenced the nature of the physical form.

The effect of the physical forms on the well-being of the inhabitants depended on the extent to which the biological needs of the inhabitants were satisfied. Hence, the physical form was developed to fit the deduced characteristics of these needs. The continued successful functioning of the form depended on the ability of the forms to satisfy new conditions as they appeared. This required that the forms be flexible and be modified to fit the future conditions.

The forms were developed in order to solve existing problems. Therefore, they tended to contrast the existing physical forms of areas in which these problems occurred. These problems referred to the sufficiency of the forms to perform their functions. (i.e.

Streets and smooth circulation, houses and adequate living conditions, available facilities and demand to be satisfied, etc.) The experience in the Linear City indicated that a correlation between physical forms and the proper functioning of the city in terms of providing the people with services and enabling them to carry out their activities, exists. This effect of the forms was influenced by social and economic factors. The choice of detailed and specific physical forms reflected the prevalent ideas of good architectural style, organization of spaces, and principles of esthetics. (i.e. The houses built by the C.M.U. were Victorian, the forms of the squares at the main intersections and the road pattern were rigid and geometric, ect.)

Soria Y Mata's physical form proposal as built seems to have satisfied two of the original goals; to provide quick and cheap surface transportation and to improve the existing conditions of city life. The form in effect proved to be inflexible. It fit the requirements of streetcar transport and not of transport in general. Soria did not foresee any development beyond the streetcar. Automobiles have smaller turning radii and are not restricted to individual rights of way. Thus even though they could work in a linear scheme as well as in some others, the linear scheme is not the one and only perfect solution for automobile transportation.

Better health seemed to be achieved as already indicated. But this may have been achieved without resorting to a Linear City. The simplest solution might have been to build new low density housing at the outskirts of the city and to adopt a suitable payment scheme.

And then, having relocated the people and provided a means to satisfy the demand, the densities in central areas could have been reduced. As it is, Soria did not improve the conditions of city life. He left them untouched. Instead, he built a new city which avoided these conditions.

The Linear City, as built, cannot be said to have influenced the development of rural areas. The system was not fully built. Moreover, Madrid grew and transformed the rural areas around the Linear City into urban ones. There was not enough time to change under the influence of the Linear City. A quicker way of bringing industry to rural areas might have been to build factories along the new road right away.

Soria Y Mata did not seek to adopt the existing facilities to the new needs but to supplant them with a new and different system. His goals had very wide implications and their realization seemed to require a great deal of time and effort. The conditions upon which Soria's ideas were based changed before the goals were achieved and the plan lost much of its validity. The main contributions of the experiment were in demonstrating the value of planning concepts such as the need to coordinate city form with the mode of transportation and the possibility to influence the direction of growth by manipulating the location of services. The Linear City also demonstrated that the physical environment influences conditions of health.

THE BROOK FARM EXPERIMENT:

The Brook Farm experiment was started in 1841 by a group of Unitarian clergyman. The experiment was a reaction to social injustice and to the practice of religion at the time. It underwent two phases. The first one was based on the doctrine of transcendentalism. This doctrine claimed that "man can attain knowledge by intuitional processes which transcend the experience of the senses."¹⁵ The second phase was based on Fourier's principles of association. The experiment continued until March 1846 when the main assets of the farm were destroyed by fire. There was a serious depression in business in 1837. The social revolution in Europe had caused an economic depression in Europe. This resulted in the withdrawal of European capital from the United States. The depression caused widespread unemployment and extreme poverty and misery in the United States. Tension between the rich and the poor increased. Religion no longer satisfied the spiritual needs of the people. It had degenerated into a cold and stylized system of worship. Instead of preaching Christian ideals of brotherhood and equality, it preached a doctrine protecting the status quo.

The Transcendentalist Phase:

A leading Unitarian, Dr. Channing, saw the need for " a spiritual revolution, the creation of a new bond between man and man, and a new sense of relation between man and his creator." ¹⁶ The society was founded upon wealth and was unsound. The competitive system had lead to the degradation of mind and heart. The existing situation, if left

untouched, would only get worse and lead to further strife. The only solution lay in the practice of Christian principles asserting the rights and dignity of each human being regardless of wealth. He formulated the concept of the "union of labor and culture" in which all people would labor together and share equally in the products of labor, while an equal chance to education for all would dissolve the artificial distinctions separating man from man. This concept was adopted as the basic principle for the Brook Farm experiment. George Ripley, a Unitarian Minister, headed the movement.

George Ripley announced that "A community is to be formed to promote . . . the great purpose of human culture, to apply the principles of justice and love to social organizations; to substitute brotherly cooperation to selfish competition; to prevent anxiety in men by a competent supplying to them of necessary wants, to guarantee each other the means of support."¹⁷ The provision of labor adopted to everybody's tastes and talents and the guarantee of the means of subsistence would enable man to have the highest mental freedom. The benefits of education would be open to all. "A society of liberal, intelligent, and cultivated persons whose relations with each other would permit a more simple and wholesome life than can be lead amidst the pressures of our more competitive institutions"¹⁸ would thus be formed.

They believed that their ideas would save the world and that one experiment would be sufficient to demonstrate to the world how to realize "the elevation of humanity to its integral rights . . ., and the establishment of happiness and peace."¹⁹ Brook Farm was selected

as the site of the experiment. The farm contained many pleasant memories for Ripley and his wife who had spent some vacations there. It fit into their concept of what an idyllic and peaceful environment should be like. The pursuit of an ideal mode of life required such an environment. There was a large building on the site. It had common rooms on the ground floor and bedrooms above. It was large enough to lodge the whole group. Also, there was a barn, animals, and farming tools. Dr. Channing preached in nearby West Roxbury. Thus, at Brook Farm they would be near their source of inspiration. The farm was near Boston where their friends lived and which would serve as a market for their produce. All these factors made them overlook that the soil was sandy and stony and that the farm had been converted into a dairy farm because the soil was not rich enough.

A number of people, mainly intellectuals, who shared Ripley's thoughts joined the experiment. Nanthaniel Hawthorne was among them. However, he was soon disappointed. He found the place overcrowded and too noisy. He was unable to continue his writing and did not find farming a very attractive occupation. Therefore, he left the group.

The Brook Farm group practiced a free system of working with no set schedule. Taking pleasure in life was considered very important. Various games and diversions were organized. They started a school which was based on the perfect freedom of thought between students and teachers. There were no regular study hours. They taught both mental and menial tasks. They aimed to "arouse personal responsibility to society and communicate a passion for intellectual inquiry."²⁰ George Ripley had many connections with Harvard University. Therefore,

the Brook Farm school received many students who had to prepare for their entrance examinations of Harvard. These students did remarkably well in their examinations. This proof of the success of the Brook Farm method of teaching gained them many pupils. Soon, the school became the most successful enterprise at Brook Farm.

However, the land was not fertile and the group did not have enough capital. They were not trained in farming methods, they were short of hands, and the system of working and playing at random was not efficient. From the very start, they were faced with economic difficulties. Also, their puritanical neighbors distrusted them as being unchristian crackpots and resented their competition in the market.

Reasons for the Change to Fourier's System:

Fourier was the son of a well-to-do merchant in the South of France. As a child, he had been exposed to the current business practices. He had often been chided for being too honest. He lived through the French revolution and was almost guillotined for being a member of a royalist family. He remained a bachelor all his life. He worked in a business firm in Paris and lived in hotels and boarding houses. He produced a tremendous amount of writing explaining and defending his often fantastic ideas.

Fourier claimed that the existing social organization and the unjust distribution of wealth caused the political and social instability of the times. Harmony and unity were desired by all people and states. To insure harmony and unity, it was necessary to provide

material prosperity for all and to create a stable and unified society. During the 1840's Albert Brisbane started to publicize Fourier's ideas in the United States. In 1841 he spoke to George Ripley and his friends explaining Fourier's ideas on economic and social organization. There is evidence that Ripley had read some of Fourier's works even before Brisbane started translating them into English. George Ripley had an extensive library and had read and been influenced by many European philosophers. In 1840, Ripley's wife wrote a review of Fourier's book, The Social Density of Man, in the Dial magazine. She said Fourier was at the head of modern thinkers whose attention had been given to the practical evils of society and means of their removal. She regarded his work as the "scientific analysis of the cooperation principle" but criticized the details of his system as "too French and unsuited to chaste New Englanders."

Brisbane's publications on Fourier's ideas increasingly aroused the interest of the Brook Farmers. "The elaborate joint stock organization of the Fourier phalanx, . . . designed to safeguard every type of vested property interest, made a strong appeal to men who had established their own community to achieve a similar purpose." ²¹ Fourier's premise of economic prosperity and freedom from unnecessary drudgery appealed to the Brook Farmers who were tired of working hard with no tangible improvement in their economic situation. The failure of the Fruitlands experiment based on the idea that if man shows good will and submission, the lord will provide also pointed out the need to be more practical. Ripley thought they could make use of Fourier's more practical ideas, for, as he said,

"We need money to keep the Farm going, and that might bring in more interested people."²²

Many similarities exist between Fourier's ideas and the principles of Brook Farm. The problems Ripley and his friends were trying to solve are very similar to those Fourier was trying to remedy. Both are dissatisfied with social injustice. They aim to eliminate the unjust distribution of profits, meager rewards of labor, and artificial barriers separating man from man. Both seem to attribute these problems to the same sources: unregulated competition and the resulting social and economic system. The solutions proposed are also similar. Both aim to demonstrate to the world the soundness of their views in one example in which man will perform physical and intellectual labor at once achieving a "unity of labor and culture" in the case of Brook Farm and "unity and harmony" in the case of Fourier. Cooperation will be the basis of production and consumption. Equal chances at education for all would dissolve social barriers. And just rewards for labor and capital would unite all men around their common good.

Both systems have religious overtones. Fourier believes to have discovered God's plan for social and economic organization. Ripley and his friends were trying to realize Christian principles respecting the rights and dignity of all men. Fourier seemed to think that the social and physical environment affects behaviour and attitudes. Ripley would have been amenable to this view. He is said to have shared the conviction that "man was a part of nature and participating in vibrant growth which could not be contained in

any pattern."²³ "George Ripley and (his friends) were aware that a man's behaviour might depend on his environment."²⁴

The Brook Farm group was not as well and as comprehensively organized as Fourier's system would call for. Fourier was more practical and claimed that all problems would be solved when all men became wealthy. He accepted the world and human nature as he thought they were. He aimed to so use these as to achieve the goals he felt all men and states shared; wealth and social stability. The Brook Farm group was more spiritually inclined. For them, the solution lay in finding the right relationship between the practical and the spiritual worlds. Men had to realize that they were brothers with similar aims in life. Unlike Fourier's system, the Brook Farm group consisted of people with similar backgrounds and interests. Therefore, among themselves, they did not have to contend with the social barriers they were trying to eliminate. They were a very small group and the inadequacy of labor made their venture economically unprofitable.

In creased publicity on Fourier attracted many who had similar problems. A social reform convention was held in Boston in 1843. Channing, Brisbane, and other Fourieristes spoke at that meeting. Many from Brook Farm attended. They became convinced that Fourier's system offered them a way out of their difficulties. They felt Fourier gave them what they always lacked; "Some science to back up the social impulse on which they had started their experiment."²⁵ The social reform convention wanted to promote Fourierisme by planning Fourieriste communities in New England. They passed a resolution

stating that the movement would start off with a model example.

Brook Farm was selected as that example.

The Fourieriste Phase:

Brook Farm was reorganized according to Fourier's principles of association. A New constitution was formulated on May first, 1845. Brook Farm was incorporated under the Massachusetts State laws. In this Constitution, the main goal is defined as "the elevation of humanity to its integral rights, and whose results will be the establishment of happiness and peace amongst the nations of the earth."²⁶ The realization of the goal requires "the establishment of justice between all interests and all men, . . . to guarantee education, the right to labor and rights of property to all, . . . (and the) actual demonstration of a state of things every way better and more advantageous (to) put an end to great evils which at present burden even the most fortunate classes."²⁷ These goals were to be realized through "the pursuit of industry in Domestic services, Agriculture, Manufactures, Commerce, Education, the study and application of the sciences, and the study and application of the Fine Arts, in accordance with the system of Association and the Laws of Universal Unity as discovered by Charles Fourier."²⁸

The New Social Science Adopted by Brook Farm:

Fourier claims that there is a plan of God which governs all things. This plan is based on the principles of attraction. Newton has discovered these principles which apply to the material world,

and Fourier now has discovered the principles which apply to the social world. The forces of attraction in men show themselves through the instincts or passions in men. There are three orders of passions. The lowest order are the sensitive passions. These stem from egoistic tendencies and constitute the five senses. They tend towards luxury. The second order are the affective passions. These result from social sentiments and tend towards the formulation of groups. The highest order are the distributive passions. These result from man's natural instincts, likes and dislikes and constitute the mainsprings of actions. There are three types of distributive passions: The cabaliste urges men to compete with one another and to perform various activities, the composite creates a sensory or spiritual satisfaction with one's actions and urges one to continue his activities, and the papillon produces a desire for variety and causes one to get tired of any activity which gets monotonous and overly repetitive.

The new order of society will be based on the laws of attraction or the free exercise of passions. These will be manipulated to stimulate men to achieve material prosperity and social unity, or Unity and Harmony throughout the world. This system is known as association. The external stimuli upon men will be manipulated to cause the passion to work in the following manner: The cabaliste will incite one to undertake a certain enterprise and will drive him to compete with others and achieve better results. The composite will produce a sense of satisfaction with the work and urge one to keep working. The papillon will interfere at the right moment and attract one towards

another occupation before the work gets too boring. Thus the worker will work continuously at a number of occupations. The change will prevent the worker from getting tired and unproductive. The lack of boredom will keep his frame of mind fresh and enthusiastic. The worker will therefore work with continued proficiency and be more productive.

Principles of Applying The New Social Science:

The new social science will soon justify itself by tripling production and profits. Material wealth will be distributed equitably. All men will have equal chances at education. This will cause them to develop similar mannerisms and social graces. Thus artificial distinctions among men will be eliminated. The equitable distribution of profits will reconcile the claims of capital and labor and cause them to realize their interdependency. Thus a unified and prosperous society will be formed.

Association will be practiced as follows: A minimum of 1600 persons of varied backgrounds and interests will be brought together. The laws of attraction would soon stimulate the formation of series and groups. A series is like an assembly line consisting of people involved in a similar line of production. A group is formed by those specializing in a specific step of production. There will be three to twenty persons in each group according to the time required by the work. And there will be a variety of groups. Thus one will have time and opportunity to work in a number of groups of his choice and practice the free exercise of passions. Each worker will be specialized in a

specific step of production. All workers will cooperate for complete production. In this way production will be more efficient.

Agricultural production and those industries which are necessary to it (such as weaving, baking, carpentry etc.) will be emphasized because they are more attractive and those are the industries which produce the necessities for life. Production will be directed to satisfy the natural needs of the people. Education also will be based on principles of attraction. Children will be exposed to varied industrial and cultural pursuits of the adults. Natural curiosity and the desire to imitate will urge the children to seek instruction in fields which interest them. In this way, they will develop their talents freely.

These 1600 persons or more will form a share holding company. At first, each person will contribute his capital, if any, his labors, and his talents. Profits will be distributed according to his contributions. Labor will receive the largest share and capital the smallest. The share of capital will be fixed while that of labor will depend on the overall profits. When the profits are high, laborers without capital will be able to invest the excessive profits as capital. Eventually all will become stock holders, or property owners. Individual shares will be computed from overall profits. Thus, no one would be able to want more for himself without at the same time wanting more for everybody else. This would, in effect, unite the individual interest with the collective interest.

The principles of cooperation and economies of scale are extended to the mode of consumption as well. All will live in one

household, sharing services such as heat, kitchens, cleaning up, etc. The people will have the choice of menus, apartments, and friends according to their inclinations. Women and children will be freed from unnecessary drudgery and will be able to contribute their energies to production. This will eliminate the wasteful repetition of facilities which exist in cities, and cut down maintenance costs. All people will be able to provide adequate, sanitary, and attractive facilities for themselves because it is less expensive to build one facility of each kind than it is to duplicate each facility for each family.

Proposed Physical Form:

Existing cities reflect the character of the existing social system. The irregular and incoherent shapes of cities symbolize "the separation and conflict of all interests, absence of unity and of concert of social action."²⁹ The forts and fortifications symbolize the hatreds and strife among nations; poor houses and asylums symbolize poverty and destitution which are moral diseases due to violations of human nature. " Confined and filthy factories (symbolize) the relentless and merciless spirit of gain"³⁰. The walls, locks, etc. incorporated into the architecture represent the distrustful and selfish spirit of society.

The associative social system will replace this architecture with an ordered, attractive, and healthy environment expressing the principles of unity and cooperation and human dignity. The association will have a square league of fertile land with a building called

a phalanstery at the center. It is preferable if the landscape would be rolling and a stream would run through the area. The land will be divided into fields in which a variety of crops will be planted. The fields are to be separated with bands of flowers and other such pleasant plants. Fruit trees are to be planted at convenient locations. Between the boundary of the land and the phalanstery will be refreshment kiosks for the workers. The area will be suitable for agricultural production. The environment will be pleasant and attractive. This would help the practice of association. The attractive environment would stimulate the desire to work and make the worker feel happier. It would stimulate better production as the worker would be healthier in such an environment.

The phalanstery will be a palace-like building in which all will live and all industrial activities will take place. At the center will be rooms shared by the community. Industrial production will take place in the side wings. Activities are to be located so that noisy and bothersome ones will be farthest from the living apartments. Some workshops are to be located in separate sheds. Easy access between various activities will be provided to allow for easier circulation of the workers among various occupations. The zoning of activities will prevent the development of animosity towards some occupations and, consequently, help the cause of social unity.

The buildings will be three storeys high. The wings will be connected with covered walkways also three storeys high. These will serve as streets. In winter, this system will eliminate the need for boots and overcoats and the catching of colds due to running in and out

of doors. The health of the labor force will be protected adding to the efficiency of production. Each wing will have a central landscaping court. The courts add to the attractiveness of the area and also increase the livable floor area without requiring an excessively long building which would not be as suitable for community living.

Members will have the choice of keeping to their apartments, dining alone, having different parties, choosing from different menus or sharing in the community activities. The desire for privacy will be respected. Forced contacts among incompatible characters will be avoided. This will prevent people from feeling of bitter and resentful of each other. A gay, happy, carnival spirit will dominate. Concerts, parades, plays will often be held. This will add to the attractiveness of the area. People will enjoy life and develop closer ties to the community. Medals and decorations will be given out. These will serve as incentives for actions.

Association as Practiced at Brook Farm:

The principles of association discussed in the text were incorporated into the constitution of Brook Farm. Production was organized into series and groups. Members were guaranteed free choice of an occupation suited to their talents and tastes. Profits were to be divided according to Fourier's ideas. The group was incorporated into a stock company. Free education and means of subsistence for all also were guaranteed. Classes were set up to instruct the farmers on Fourier's system. It was decided to continue with the four existing buildings and defer the building of a phalanstery until their economic

situation improved. The oldest and largest building was used for community affairs. The kitchens, the dining room, the social rooms were in that building. It also contained the bedrooms of the older members.

Many applied for membership to Brook Farm. New members were admitted according to how useful they would be to the association. Ripley was not as concerned with the attitudes and views on spiritual questions the applicants had as he had been while considering new members for Brook Farm during the transcendentalist phase. As a result, Brook Farm assumed a new aspect. It no longer was a society of spiritual dreamers. The members were not refined or intellectual. They were of the working class and interested in earning their keep. The esthetic view of life disappeared. Instead of voluntary work and personal responsibility, a compulsory feeling about work appeared. Many of the old members seeking a medium between the spiritual and the practical worlds became dissatisfied with Brook Farm and left.

The farmers organized themselves into farming and cattle series, a planting group which changed into haying or hoeing with the seasons, kitchen, washing, mending, ironing, and teachers' groups, and the sacred legion. The sacred legion consisted of children. Their duty was to clean up. They organized parades and awarded flags, medals, etc. for good work. This type of incentive seemed to work well and the sacred legion became very successful. Later on trade groups and carpenters', shoemakers', tailors', and printers' groups were organized. The printers published a magazine called The Harbinger. This magazine became the mouthpiece of the Brook Farmers.

Soon, conflicts developed among the old and the new members. The new members resented those who could think as well as work and found that the teachers' group, which consisted mainly of old members, had an easy and too many privileges. They considered living at the Hive, the oldest building, a mark of distinction. They called those who lived there, the aristocracy. They were jealous of each other. Consequently, any social affair had to be planned to include everybody. Many found that parties with so many people were not as much fun. Older members started having private gatherings etc. Factions developed. The older members felt that it was "hard to treat the undesirable element as equal . . . and to conceal distaste."³¹

There was a competition among members to obtain authority. Many were presumptuous and arrogant. Consequently, the social harmony was often upset. It was clear that "Passional Equilibrium had not yet been established."³² Even though membership had increased, there still were too few hands. Therefore an association as free as that proposed by Fourier could not be practiced. A spirit of urgency developed. Strict work schedules were formed. Due to the shortage of hands, contrary to rule, the trouble making members were not dismissed.

Economically, Brook Farm became increasingly successful. Their assets were valued at thirty thousand dollars. At the end of 1843 they had had a two thousand dollars deficit. At the end of 1844 they showed a balance of one thousand dollars. This was considered as capital and invested in improvements. The farmers felt they had come successfully through four experimental years and that now it was

time to expand. They decided to build a phalanstery as suggested by Fourier. This building would provide the additional room to accept new members. With additional members their capital and production would increase. Ripley saw the future quite clear after that. The building became their most talked about project and seemed to gather all members around their common interest.

The proposed building followed Fourier's model except it would not have wings as it did not have to be as large. The building was to be of wood and three storeys high. The ground floor contained kitchens, dining rooms, meeting halls, and other such common rooms. The upper floors were to have private apartments. Three storey high corridors would run all along the building. All hopes were put into this building and much money borrowed using the farm as security. Then, in March 1846, just as the building was finished, a fire completely destroyed it. The group did not have enough capital to continue. The school no longer was a successful venture. A smallpox epidemics had scared many of their pupils away. Fourier's more startling ideas about the organization of society, the universe, and the nature of god had been publicized by Brisbane. This had caused the public opinion to turn against Fourierisme and Brook Farm. Many more pupils had been withdrawn from the school. Outside investors had lost interest in Brook Farm. The campaign to borrow money after the fire failed. Slowly, all the members left. Many joined the North American phalanx, another Fourieriste experiment.

In spite of this collapse, Brook Farm cannot be said to be a failure. In the first phase, they demonstrated that a thinker could

also be a laborer and that the good life was not necessarily one of penance but one of gayety and happiness. In the second phase, they demonstrated the issential advantages of cooperation in production and in consumption. They also pointed out the possibility to unite different social classes under a common goal. As W.H. Channing said "The attempt was ill-contrived, worse executed,. The land was only moderate, water power wanting, markets not accessible, capital insufficient . . . industry inorganized, business entangled, . . . (yet enough had been accomplished) to testify to the possibility of associated industry under more favorable circumstances."³³

ANALYSIS OF GOALS AND FORMS IN THE BROOK FARM EXPERIMENT:

The proposal for social and economic reorganization aims to achieve happiness and peace on earth. This aim is to be realized through five supplementary goals. These were formulated by observing the existing situation, determining the nature of the existing problems, and analyzing the relation of these problems to the existing situation. This process determined the field of influence and the requirement of each goal. These requirements were translated into proposals for action. Many of these proposals are regulatory devices which control actions directed towards people rather than physical objects. These proposals determined the nature and types of land uses, the activity pattern, the ideals of the community, and the organization and visual appearance of the environment. The proposals determined the symbolic significance and the functions of the physical form in fulfilling the goals. They also defined the components of the physical form. In this case, the physical form refers to living and working areas -enclosed or open- to the spatial relation between these, and to the distribution of uses.

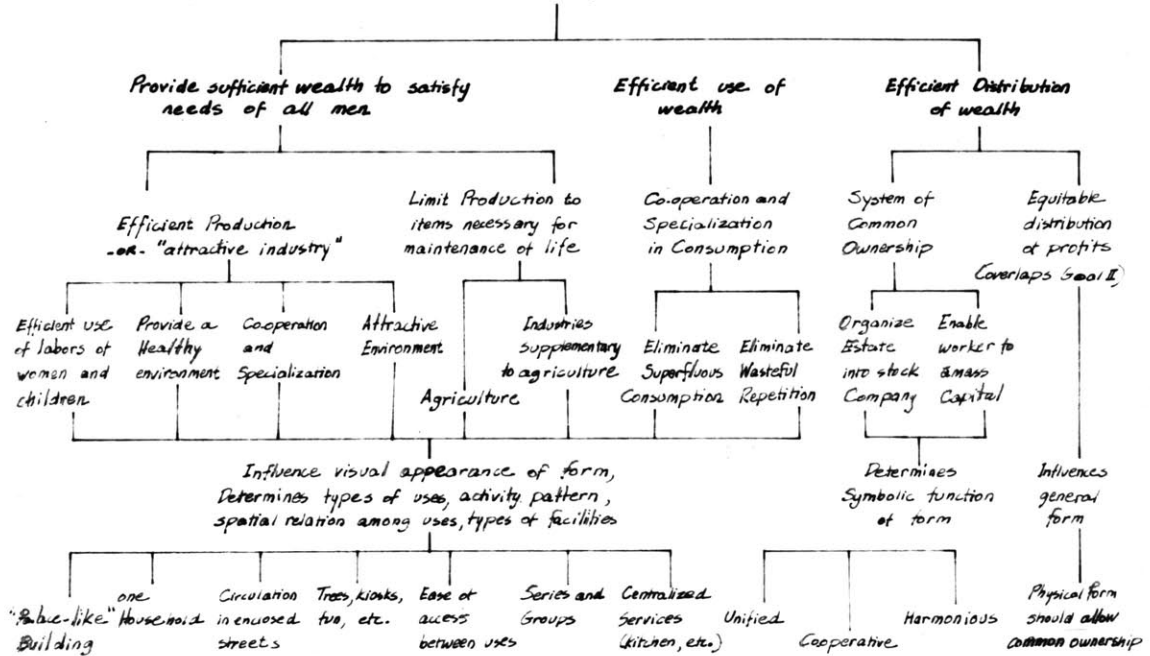
The first goal is to enable all men to own and enjoy wealth. This goal indicates that wealth was not distributed equitably at the time. Fourier felt that all men desired material prosperity and that the lack of enough wealth to satisfy everybody caused social revolutions. Ripley was forced to accept this goal by the serious economic difficulties at Brook Farm. This goal implies that happiness and peace on earth can be achieved through material prosperity. Since those who revolted were poor and those in power rich; those who

General Goal : Elevation of Humanity to its Integral Rights - OR - Happiness and Peace on Earth.

Field of Influence : Attitudes of men to each other
Social and Economic organization.


Requirements = Supplementary Goals.

Goal I : Enable all men to own and enjoy wealth - (Right of Property)




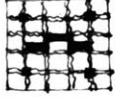
Field of influence : Production, distribution, and use of wealth

Requirements : Enough property to go around, provide means to acquire wealth

Existing Form :  fragmented, expensive property, restricted to enjoyment of few, limited supply of wealth, production of superfluous items

Proposed Form :  Unified, Commonly Owned

 Only wealth necessary for maintenance of life produced, production based on co-operation and specialization

 Attractive and Healthy working and living environment
Increase efficiency of production
Protect Worker
Make wealth enjoyable

(i.e. see proposed solution diagram)

revolted must have wanted that richness they lacked. This seems to be an oversimplification of the issues.

This goal affected the production, distribution and consumption of wealth. The fulfillment of the goal required the increase of available wealth by more efficient production methods and the limitation of production to items necessary for life. This would increase the wealth and make it possible to satisfy the vital needs of everyone. This wealth had to be distributed equitably to enable all to own property, and it had to be consumed efficiently to benefit all persons. They proposed a system of attractive industry based on cooperation and specialization. The labor force had to be used efficiently. The labors of women and children should not be wasted. Workers should be provided with incentive to produce better. A healthy and attractive environment would preserve the productivity of each worker and provide incentives for work. The workers would form communities organized into stock companies in which each person would be able to become part owner of the estate. Working for one's own profit would be an added incentive for good work. Consumption also would be based on cooperation. There would be one household and centralized services, such as kitchens, laundry and so on. This would eliminate wasteful repetition of facilities and free women and children from unnecessary drudgery. Thus, they could become useful in production.

These proposals seem to contrast the existing conditions. Simple correlations between conditions and observed effects were made, explaining the causes of the problems. These may or may not hold

true. It is now generally accepted that workers in good health are more productive and that cooperation and specialization in production is more effective. Fourier based his proposals on the principles of passionnal attraction. These principles were accepted by Ripley. They were based upon an analogy between the physical and social worlds. This does not seem valid. The physical world, for most practical purposes is constant and governed by universal laws. Societies constantly change under the influence of changes in the physical environment, technological and intellectual developments, other societies, and so on. The elements of the physical world are relatively constant, or change at a much slower rate than the elements of the social world. These latter changes constantly with each generation of people. The analogy seems quite irrelevant, even though the principles developed by Fourier are quite ingenious and indicate interesting and acute insights into human motivation.

The measures for the efficient distribution of wealth would make all people equal in material well-being. This equality would be reflected in the physical form symbolizing unity. The other measures influenced the visual appearance of the forms, and determined the types of uses, the activity pattern, and the types of facilities to be provided. The phalanstery was proposed as a building housing living and working areas. It was planned according to principles of cooperation and specialization in consumption. It had courts to make it more attractive and to increase the usable floor space. The street corridors kept people in good health by protecting them from the elements. The uses were zoned so as none would be a nuisance.

This protected social harmony. The visual appearance, specified as palace-like, and the trees and flowers surrounding the fields were to make the area more attractive. These indicate the accepted architectural style of the time (i.e. the shape, porticoes, etc. of the building). The implied correlation between palace-like and harmonious, square and the perfect form indicate symbolic associations between forms and meanings.

In Brook Farm, the phalanstery proposed by Fourier was in effect never built. The locations of the fields and the workshops were not consciously coordinated to enable cooperation and the free exercise of attraction. The land was not chosen on the basis of its fertility. The farmers mainly adapted the existing facilities to their needs. A comparison between the results of the Brook Farm experiment and those expected by Fourier's system can still be made because the circumstances at Brook Farm were quite similar to those specified by Fourier. The existing building was similar to a phalanstery. It had a central and large hall with kitchens, dining rooms, laundry and such commonly shared facilities surrounding the hall. For a while at least, they all lived there. As their numbers increased, some member had to live in other buildings surrounding the main one. The effects of this separation, as well be analyzed, tend to enforce Fourier's ideas. Their activities were not varied enough to require extensive planning of the activity pattern

In the experiment, the fertility of the land did turn out to be a major determinant of agricultural productivity. The reasons

for this effect are obvious. Yet to Ripley and his friends, who had never worked on farms and knew nothing about farming, it was not. They chose the land because it was near to their friends, it appeared idyllic, and contained pleasant memories. Channing points out that markets were not accessible to the farm. Their failure was due to economic difficulties. The fertility of the land may be considered of major importance in fulfilling the goals. But, if they had had enough capital to improve the land and diversify their industries, they might not have failed. Therefore, productivity depended not only on fertility but also on initial capital and skill.

The farmers found Brook Farm very attractive. They seemed to enjoy working in the fresh air. This may have increased productivity. But, a definite claim cannot be made. Many may prefer to sleep under a tree, surrounded by flowers instead of carting fertilizer. Indeed, that is what Hawthorne said. Individual temperament seems to determine whether attractive environment stimulates one to work effectively or not. Attractive environment, if interpreted to mean a healthy place with enough fresh air to breathe, free of excessive noise, and so on, would influence productivity. The case does not indicate whether or not this did happen in Brook Farm. However, experiments with working conditions in factories maintain the validity of this idea. Also, a person who is in good health is in full control of all his faculties and can therefore work better, if he wants to.

Productivity in Brook Farm increased as the experiment continued.

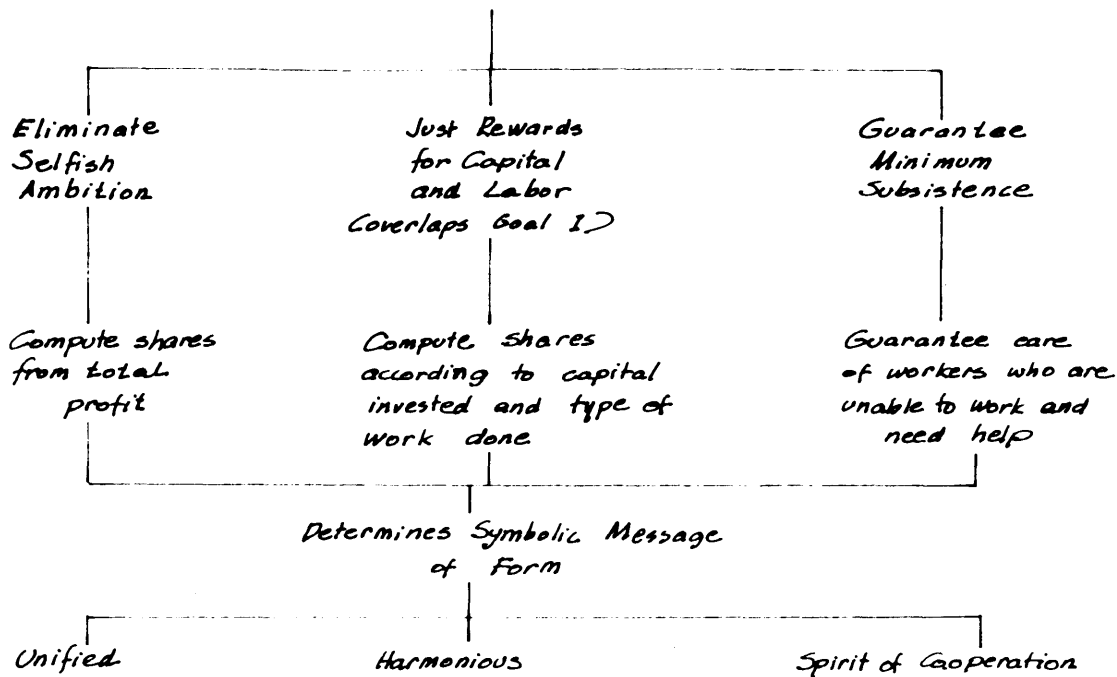
But this is due to strong incentives for work, such as individual profit, and to cooperation and specialization. It is interesting to note that free cooperation advocated by Fourier and practiced during the first phase proved time wasting and inefficient.

Efficiency increased when the work was subjected to strict schedule and enforced by a feeling of urgency about work. This change was caused by the realization of the necessity of material prosperity for the success of the experiment. Also, in the second phase members were admitted on the basis of the work they could do. This also helped increase productivity. Free cooperation or association might have worked if Brook Farm had had as many members as required by Fourier's system. The insufficiency of available labor might have been the cause of the inefficiency of the method.

Cooperative consumption influenced the efficient or economic use of wealth in Brook Farm. One kitchen, one dining room, at most two menus: one vegetarian and one meat, one laundry; in short, one household enabled the members to share the work. This eliminated the need to duplicate the same facilities in each building. It was more economical. It did not make life easier for the women because there still were too few people to do the work. The value of consumption cooperatives is widely recognized today. Many groups have formed such institutions and are thus able to obtain goods and services at less cost and better quality. This practice is quite widespread in Turkey and in many European countries.

The second goal is to establish justice between all interests and all men. Ripley and Fourier found that the existing system was


Goal II : Establish Justice Between All Interests and All Men



Field of Influence : Relation between capital and labor, the individual and society

Requirements : Just Rewards for labor and capital, emphasize common interests, make society responsible for welfare of members.

Existing Form :  - reflects existing society - incoherent, fragmented, selfish, distrustful

Proposed Form :  Clear, unified, Harmonious, Cooperative, trustful

full of injustices which resulted in more or less violent conflicts among men and social classes. Fourier had personally experienced such conflicts. Ripley, as a minister, had observed the problem and had felt compelled to act to solve it. This goal reflects the existing conditions and the personal experience and interests of the authors. The field of influence of this goal refers to the relation between capital and labor, and the individual and society. They proposed that selfish ambition be eliminated, or competition be regulated. Capital and labor should receive just rewards, and the minimum subsistence of people should be guaranteed by society. These proposals reflect Ripley's (and Fourier's) analysis of existing problems. This analysis was based on the observation of existing practices and evaluation of their results. There was no proof offered for the correlations which were drawn between current forms and practices and the existing conditions. However, historical accounts of 19th century economic and social systems support the idea that meager rewards for labor lead to degrading living conditions for the workers and to social unrest, and that unregulated competition allowed for social injustice.

They proposed to achieve the goal by making it impossible for each person to desire more for himself without at the same time desiring more for all the others. Profit would be divided equitably between capital and labor, rewarding labor according to amount and type of work. Capital would receive a fixed profit on the basis of capital invested. Individual profit would be computed from total profits. Thus an individual's attempts to increase his own profits

would also increase the profits of everybody else. Guaranteeing minimum subsistence for the needy would create a new bond between man and society. Society would assume responsibility for its members. This would free men from excessive anxiety which might drive them to desperate and violent actions. These measures would help maintain harmony and peace.

These proposals represent a contrast to the existing social and economic system. The physical form housing the new social system also is a reverse of the existing conditions. The physical form, in this case, acts as a symbol and reminder of the new social ideals; harmony and unity. The physical form also influences the achievement of these goals directly by enabling the smooth functioning of the new activity pattern dictated by the new social ideals.

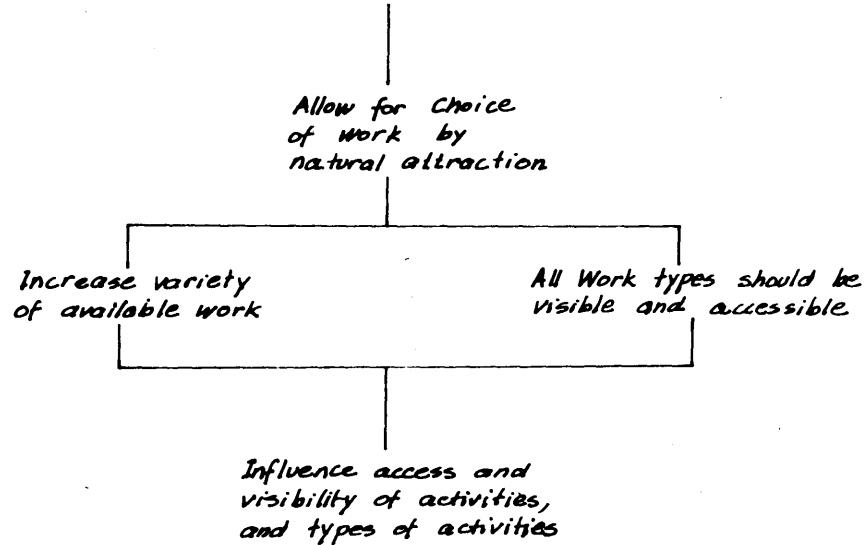
Living and working together did not always lead to social unity in Brook Farm. In the first phase, Hawthorne could not find enough privacy and, therefore, left the group. Fourier suggested that private apartments be provided. In Brook Farm they had private rooms divided by thin walls allowing the noise to pass freely from room to room. Maybe if Hawthorne had had a private apartment, he would have stayed. This again goes back to the question of having enough initial capital to build with.

In the second phase, conflicts between the old and new members developed. Newcomers were jealous of those living in the oldest and largest building in which all the community functions also took place. Maybe, if the building had been large enough to house them all, such conflicts would not have developed. In this case, the physical

form failed to accommodate the requirements of the activity pattern which was based on living and working together. The physical form, the building, became a symbol of prestige and assumed certain meanings due to the character of its use. Social unity appeared to be influenced by the attractiveness of the area as well. Many of the older members in their memoirs tell how they missed the farm and the ideal quality it had. Some members formed strong enough attachments to the farm. This led them to remain there and to try to revive the experiment long after the fire.

The new building which would have enabled them to expand and increase their economic capacity became a symbol of their common interests and united them about a joint cause. The downfall of Brook Farm came when this building burned down. They had invested all they had into this building. Therefore, when it was destroyed they lost everything. The form may not be totally blamed for this event. Their downfall was due to the mismanagement of capital. A possible effect of the form in this case maybe that the proposed form was too extravagant in relation to what they could afford at the time. This indicates that an elaborate physical form should not be built before the economic situation is ordered. Otherwise, it becomes an unwarranted luxury. It ties up capital in essentially unproductive activities. In Brook Farm, if their aim had only been to increase the labor force, they could have built temporary housing for the new members instead of the phalanstery. The decision to build a phalanstery indicates that they wanted to build a symbol or monument for their activities as well as increase their

Goal III: Enable All Men to Find Work Suited to their Tastes and Talents

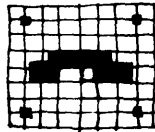


Field of Influence: Types and Locations of activities

Requirements: Exposure to all activities to permit choice by natural attraction

Existing Form: Un-visible, limited, forced, lack of choice

Proposed Form:



Variety of Work
free choice
accessible
visible

economic capacity.

The third goal is to enable all persons to find work suited to their tastes and talents. This goal affects the types and locations of the activities. It requires that a wide variety of activities be made readily available to each person so he can decide which one he would like to work at best. This goal is again based on the existing conditions and the proposals try to reverse them. Fourier based himself on his principles of attraction in this proposal. These principles have already been discussed. Fourier claimed that each person has specific talents and that each person should be helped to discover and cultivate his talents. A person working at a job particularly suited to his talents and inclinations would work better and with more enthusiasm. Thus he would be a more productive member of society. This analysis is rather interesting and many would agree with Fourier that work done willingly is of higher quality. These proposals require that the activities be varied enough to appeal to all persons and that they be readily accessible to enable free choice.

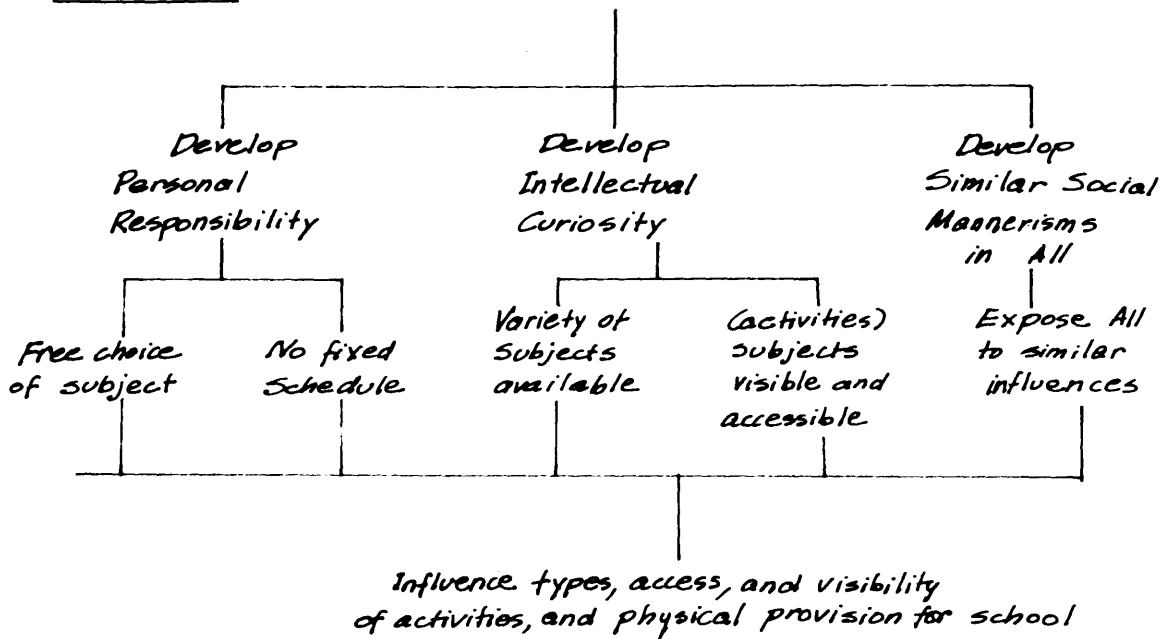
These principles were not really followed in practice. Instead of fitting the work to the talents of the members, members were chosen on the basis of whether or not their tastes and talents were suited to the range of activities at the farm. One result of this policy was that some members from the first phase did not find the activities to be suited to their tastes and talents in the second phase and, therefore, left the experiment. The activities were not planned so as to be readily accessible to all members. But the

range of activities was not wide and the farm was small. Therefore, even though not planned consciously, the activities were readily accessible to all members. In spite of this, the choice of the work was not free. Work was scheduled and each member worked at one job. This perhaps was due to the shortage of labor at the farm.

The next goal is to enable persons to receive the benefits of education. This goal affects the availability of education, the choice of the subject matter, and the method of teaching. The policy of action was to develop a sense of personal responsibility to society, intellectual curiosity, and similar mannerisms in the student. In this way, future members of society would be trained to believe in the principles of equality and brotherhood, respect one another, and recognize and fulfill their duties. Similar manners would destroy the artificial distinctions among men. Many causes for distaste and intolerance of other people would disappear. This goal is based on the comparison of poor and rich people; their attitudes, way of life, and mode of behaviour. The differences between them were attributed to the lack of opportunity to develop social graces among the poor people. This to a certain extent may be true. However, there may be reasons other than lack of education explaining the differences in manner. Rich people can be as crude as some poor people and poor people can be as graceful as some rich ones.

Fourier and Ripley interpret this goal as requiring free choice of subject matter. Freedom in the pursuit of studies would develop the sense of personal responsibility. A wide range of readily

Goal II : Enable All to Receive Benefits of Education



Field of Influence : Availability of and choice in education
Method of Education

Requirements : Freedom in choice and pursuit of subject,
Exposure to similar influences

Existing : Lack of choice, limited to a few

Proposed : Free choice, wide variety, open to all

Goal II : To demonstrate to the world the validity of the proposals in one experiment

Field of influence : Promoting the use

Requirements : Propaganda, publication of results, explanation of principles, gaining converts

Proposed : The Harbinger, lectures open to the public, guests encouraged

accessible subjects would develop intellectual curiosity. Exposing all pupils to similar influences would develop similar mannerisms. Education should be free for the children of the new society. The exposure to various subjects, intellectual or manual work, would enable free choice by inclination. This would stimulate the pupil to work willingly and with pleasure. Lack of schedule and strict hours would make the vigor of his studies depend on his own decisions only. This would, hopefully, make him feel responsible. Again, this proposal is based on Fourier's theory of attraction. Although it might work as described, there is just as much chance that it might not. This goal influences the types, accessibility, and visibility of activities. The subject taught would be derived from actual production in progress, and abstract subjects would be taught specifically.

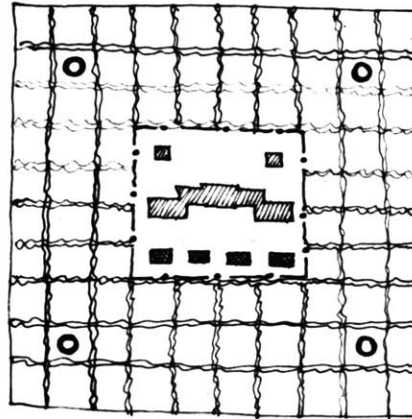
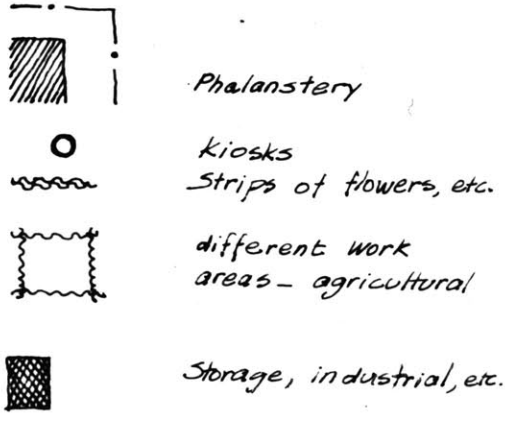
The system of education followed these principles quite closely in practice. The range of subjects was limited because the range of activities in Brook Farm were limited. The success of the Brook Farm students in the Harvard Examinations indicate the validity of the method of teaching. In Brook Farm many lectures and discussions were organized as part of the life and recreation for all members. Students profited from these activities as many of the speakers were recognized intellectuals of the times. The manual and intellectual pursuits were carried out simultaneously. For example, one member who later founded the society of Paulist fathers, used to read Kant while baking bread. However, the system did not work out in every case. One of the students was not interested in intellectual

pursuits or farming. He later became a sailor. The successful application of the system depended on the temperament of the students.

These proposals when put into practice would justify themselves by tripling production. This would win the world over to practice the new social system. The fifth goal, therefore, is to demonstrate to the world in one experiment the validity of the proposals. This goal affects the communication of their ideas and results of the experiment. Such information should be published and the principles of association should be explained and promoted. The farm should be accessible to all who may want to visit it. The Brook Farm association therefore started publishing the Harbinger magazine which served as their mouthpiece. The farm welcomed all visitors. The neighboring farmers and all who might be interested were welcomed and encouraged to attend the lectures on Fourier organized for the members of the Association.

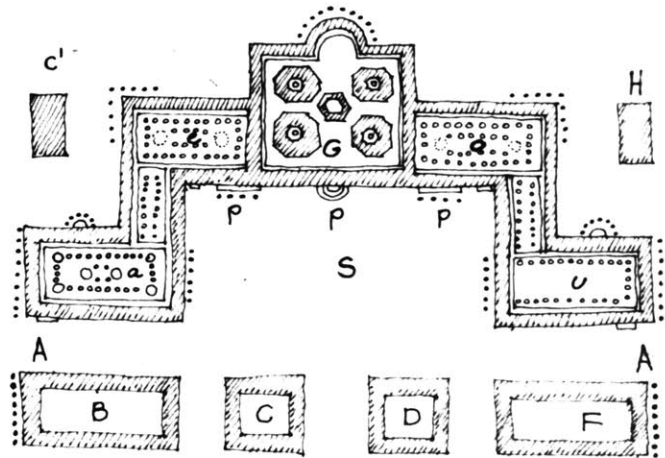
The total proposed physical form unites all individual proposals. The overall form is a square, with the palace-like phalanstery and outer buildings located at the center. The phalanstery has a tower at the center and tall classical porticoes at the doorways. It is oriented around a central space. Fourier appears to consider the square a perfect form and therefore suitable to a perfect society. That the phalanstery is palace-like with many accepted features of existing palaces indicates a belief that such forms are harmonious. Also, since all men are equals and as good as kings, it is suitable that they live in a palace. These

Proposed Solution:



Phalanstery, Ground Plan:

- A - Avenue
- S - Public Square
- G - Garden within central range of bldgs. with green houses, and forms a winter promenade
- a, e, o, u - Courtyards - about 100' wide ornamented with shrubbery and crossed by corridors
- P, P, P - large portals, main entrances.
- C' - Church
- H - Hall for musical representations and festivities
- B, C, D, F - Granaries, store houses, and other out-buildings.



The Phalanstery and Grounds

choices indicate symbolic associations.

Only one facility for each function is provided. This reflects the desire for unity and cooperative consumption. The exception to this is the many and varied private apartments, the varied menus and dining arrangements. These are not shown in detail in the form. They are specified in the written proposal. They are provided to allow members choice in the company they keep. These measures seek to prevent forced contact of incompatible characters and the subsequent development of bitterness and resentment. This reflects the desire for social harmony. Social harmony therefore seems to be emphasized over unity. Perhaps because unity of action may be possible only when there is social harmony. Formal unity is therefore deemphasized. The private accommodations are very similar to hotels and boarding houses. Fourier had lived most of his life in such establishments. The choice of these accommodations may be due to his personal experience.

Comments:

In the Brook Farm experiment, the physical form influenced the realization of the goals. The characteristics of the soil and the spatial relation of the farm to other areas influenced agricultural productivity. The form had to fit the specific requirements of each goal. The requirements of the goal should determine the nature of the form. One reason for the failure of Brook Farm was that the form did not fulfill the specific requirement of the goal. It was not suited to agricultural production. The esthetic qualities of

the area caused many to develop strong ties to the Farm and hence to the community living there. Symbolic associations appeared to influence social coherence. The types of facilities provided determined the mode of consumption. The existing facilities, the barn, animals, fields, orchard, etc., determined the mode of production.

The type and distribution of facilities appeared to influence the social attitudes of the members. Forms tended to assume a significance which was not related to their visual appearance but to the nature of their use. For example, the Hive (the oldest building), was the largest building and therefore suited for community functions. Therefore the meanings associated with the form, to a certain extent, depended upon the physical characteristics of the form.

In the building of the phalanstery, the choice of the form reflected the influence of Fourier upon Brook Farm. Fourier seemed to be influenced by the then current principles of style and by symbolic associations between forms and some meanings. For example, classical porticoes and Baroque building shapes were associated with palace-like or kingly and dignified.

In the Brook Farm experiment, the following goals were realized: To enable all to own and enjoy wealth, to establish justice between all interests and all men, and to enable all to receive the benefits of education. The measures for the equitable distribution of profits seemed to work to the satisfaction of all members. At least, the conflicts between them did not seem to have been

caused by questions on the distribution of profits. Cooperation and specialization in consumption and production appeared to be economical and effective. The venture failed because of insufficient capital. The wealth they had was enjoyed by all members to the same degree, and all seemed to share in the hardships due to poverty. There are many indications that the experiment would have been successful had the conditions been more favorable. If public opinion had been favorable, they might have found outside investors to continue the experiment after the fire. Or, if they had had more initial capital, they might have overcome the difficulties in production and housing.

Many external factors seem to have influenced the course of the experiment. When it was started, there existed a serious economic depression. Many shared the basic problems, unequitable distribution of wealth and social injustice that the Brook Farmers aimed to solve. Therefore, many were interested in financing and/or joining the venture. By 1846, the economic situation had improved. The problem was no longer felt as acutely as it had been earlier. Interest in Brook Farm decreased. The publication of Fourier's less acceptable ideas turned public opinion against Fourierism and therefore, Brook Farm. This also seems to have caused the withdrawal of support from Brook Farm.

The goals of Fourier and Ripley were directed at more than the provision of material security. Wealth was a means to achieve their wider goal, peace and harmony on earth. They wanted to establish a new and different social outlook and frame of mind.

Such a change seems to require a great deal of time and careful and continuous promotion. Those who join such a venture must be completely convinced of the worth of the abstract ideals such as justice between all men and all interests and the principles of association. Many of the Brook Farm members seemed to regard the experiment as just another means of earning their bread and butter. Their aims were practical and not idealistic. Therefore, when the venture failed materially, they just left and joined a more promising group. Had their motives been idealistic, they might have persisted in the struggle.

The contribution of the Brook Farm experiment is one of demonstrating the validity of certain concepts. It indicated the essential economy and efficiency of cooperation and specialization in production and consumption. It demonstrated the possibility to unite different social classes under a common cause. The experiment suggested that the physical form might influence the realization of the social and economic goals by manipulating the activity pattern, the distribution of uses, and the symbolic meanings associated with certain forms.

The nature of the goals and the role of the physical form in fulfilling the goals are different in each case study. In the Linear City, the goals make specific reference to the forms. They are directed towards actions affecting tangible objects. Goals such as improving existing living conditions in cities, developing rural areas, establishing an effective transport system can be linked directly to some aspect of the physical form. These links are implied in the goal statements themselves. In Brook Farm, or in Fourier's system, the goals refer to social and economic organization. They are directed toward actions affecting not objects but people; their attitudes and mode of behaviour. The goal statements in this case do not directly implicate forms. They are: the establishment of justice between all interests and all men, enabling all men to own property, find work suitable to their tastes and talents, have an education and convert the world to the new way of life.

In the first case, the form is directly involved in the achievement of the goals. It acts as the most significant means in realizing the goals. In the second case, most of the proposals are measures regulating people's mode of behaviour and the transactions among men. Men live and work in a physical environment. Therefore, the physical forms have to be developed according to the dictates and implications of the regulatory measures. The effect of the forms upon goal-realization goes through two steps in this case. The forms help the implementation of the regulations. And the regulations

fulfill the requirements of the goals. The first case is based upon an already established and observable activity pattern. The plan aims to remove the conditions blocking the smooth and efficient functioning of this activity pattern. It aims to re-locate the services and other facilities so as to eliminate congestion and to spur the development of the countryside. The nature of the activities before and after the plan remains the same. In the second case, the activity pattern itself is condemned. The plan aims to establish a new and better activity pattern which will fulfill the needs of human beings. In the first case, the goals express the requirements of the activities and the flows in terms of spatial organization and of the satisfaction of the demands upon them. In the second case, the goals express values dictated by social principles. Modern day planning aims to realize both types of goals.

In both cases, the physical form consists of physical facilities - buildings, streets, and spaces and of the spatial and functional relationships among these facilities. In both cases, specific effects of the form upon the realization of the goals are similar. The forms fulfill their functions by coordinating the location and distribution of facilities with the activity pattern. They are designed to satisfy the requirements of the flows, and of the physiological requirements for life. The forms also appeared to assume symbolic meanings either through their architectural style or use, or both. This furthered, or hindered as the case may be, the realization of the goals.

Forms, even though developed individually to satisfy the requirements of corresponding goals, appeared to influence goal-realization as a whole rather than individually. The Linear City lost its appeal because it did not offer enough consumers' services, it did not have a protective buffer zone, and the streetcar lost its popularity. It is hard to say whether any one of these factors by itself would have had the same effect. Nor can one correctly evaluate the influence of the development of other suburbs. Brook Farm failed because the land was not fertile, they were far from markets, and they did not have enough room to expand their labor force. These aspects of forms seem to have acted together in bringing about the downfall of Brook Farm. The individual effects of the forms cannot be really isolated. Perhaps, this suggests that physical forms affect one another. The extent to which they fulfill the requirements of the goals may be influenced by this interaction. The analysis of isolated relations between goals and forms, as far as this analysis is possible, may indicate clues about the nature of such interaction.

Goal realization was influenced by unintended effects of the forms. In the Linear City, the C.M.U. found the length of the form to be excessive and to hinder the development of a community spirit. Theoretically, the length of the city had been considered an asset; the city would be able to grow indefinitely as the demand increased by adding on new linear segments. In Brook Farm, the multiplicity of housing facilities caused the development of social disunity among the members. The building of the Phalanstery was considered

beneficial as it would enable the Farm to increase membership. The possible effect of the building as a drain on capital and as a basically unproductive investment was not considered. These unforeseen effects of forms effected the eventual failure of each scheme . The Linear City lost some of its population which might have stayed on if they had been a closely knit community. Brook Farm went bankrupt when the new building burnt down. Most of the members did not hesitate to leave the Farm. They might have kept on truggling if the social unity had been stronger.

The choice of the goals depended on the analysis and interpretation of the existing situation. And most of the forms developed appear to contrast the existing forms. This implies that existing forms caused the existing problems. One, therefore, has to substitute these forms with contrasting forms to solve the problems. Since the problems were interpreted as reflecting the worst possible situation, directly contrasting forms would help establish the best possible situation. This idea indicates a belief that the physical environment influences the behaviour of people. However, the correlations between the forms and their effects in the cases studied appear to be oversimplified explanations of the situation. The correlation between vertebral forms and transport systems, attractive areas and the desire to work well are examples which have already been discussed.

The interpretation of the situation and the choice of physical forms in the case studies seemed to depend on a number of factors. The assessment of problems depended on the existing

Intellectual climate and on the authors' personal interests. His personal experiences and training influenced the authors' point of view. Social and cultural values also helped determine the nature of the goals. The choice or formulation of a physical form depended on the extent of observation of the existing conditions and of the research on cause-effect relationships. The extent of the authors' previous knowledge about the question at hand also influenced their choice of form. The intellectual climate, social and cultural values, and the author's personal experiences appeared to influence the development of the form as well as that of the goal. These have been discussed in the individual cases. The influence of these factors upon the development of goals and forms indicate a need for more objective study of the existing situation and of the nature of the goals. Subjective preferences and irrational value judgements should be avoided.

The case studies suggest that in order to formulate successful forms, the nature of these influences must be known and evaluated. In the case of Brook Farm, the subjective reasons for choosing the site, the lack of knowledge about farming, and the inability for good management caused their downfall. These might have been avoided if the venture had been planned with full knowledge of all the factors involved. In the Linear City, failure to recognize the need for adaptability to changing conditions and the over-reliance on the vertebral pattern and straight lines appeared to cause the decline of the area after a while. Again, if the implications of these forms had been fully known and the author

had been aware of the reasons behind his choices, he might have developed a more successful pattern.

Successful application of the forms was influenced by the availability of capital and the attitudes of people. The realization of forms required economic capacity to do so. Both Brook Farm and the Linear City were continuously hindered by economic difficulties. The goals advocated by the schemes had to be shared by a majority of people and to refer to problems urgently felt by them in order to put the proposed actions into practice. In the case of Brook Farm, the failure to interest capital occurred when the general economic situation started improving and interest in Fourier waned. The Linear City stopped being the center of interest because it was supplanted by more pressing political problems. The timeliness of the proposals in terms of immediate recognized needs appeared to influence the extent of goal realization.

Some specific connections between forms and goals are seen in the cases studied. The distribution of uses seemed to influence the proper functioning of the activity pattern adopted or specified by the goals. Specific spatial aspects of the forms and the services provided seemed to influence the physiological and psychological needs of people. Both of these connections were based on the analysis and assessment of what the functional requirements of the uses and the needs of people were. The forms appeared to have symbolic connections with the goals. The goals defined the abstract principles which were to be embodied in the forms. The forms

thus acted as a reminder of the common ideals and gave society a source of identification. The forms appeared to assume meanings through their use. The specific formal aspects which made the forms suited to these uses also influenced symbolic meanings of the forms. These meanings provided a basis for differentiating among the forms.

Implications of the Two Cases for the Study of Goal-Form Relationships:

The cases analyzed in this paper suggest that the study of goal-form relationships may have two aspects: 1) The factors which determine the interpretation of the existing situation and the possible effects of these factors upon the choice of goals and of forms, and 2) The specific effects of forms.

The first aspect refers to those connections between goals and forms which stem from a particular interpretation of the existing situation. These connections vary according to the time and the place, or the setting of the plan. The latter aspect refers to those effects of physical form which do not depend on the social and cultural context, such as the effects of forms upon the physiological and psychological requirements for life. The specific connections between goals and forms refer to those aspects of the physical form which would be most likely to come within the field of influence of certain types of goals. A simple example illustrating such a connection is the relation between street systems and goals referring to traffic flow within the city. The study of these connections would require that possible types of

goals and of forms be categorized and the specific connections between them be analyzed. The functional requirements of each goal would influence the nature of its connection to the physical form. These two types of goal-form relationships may be expected to overlap. For example, the functional requirements of a goal may be one of the factors influencing the choice of a form. The first aspect of the study would be useful mainly for purposes of analysis and would help isolate and evaluate all the forces and issues involved. It would help define the field of influence and the functional requirements of the goals. The second aspect of the study would be useful mainly in developing plans or fitting the physical form to the requirements of the goals.

The cases suggest that a study of goal-form relationships requires the formulation of a method for analyzing the existing situation and assessing the correlations, if any, between the existing forms and the observed conditions. They suggest the need to wait for or develop a climate of opinion favorable for the implementation of the proposal. It appears that realization may to a large extent depend on the general recognition - or timeliness - of the problems the forms propose to solve. The forms, to be successful, seem to require that they satisfy the need of the activity pattern, fulfill the necessities for life, and have the appropriate symbolic significance in their location, use and architectural detail. The development of appropriate forms requires that the character and requirements of the activity pattern and the physiological and psychological effects of the forms

be assessed. The meanings associated with given forms and the reasons for these associations will need to be known. The influence of physical forms upon the activity pattern; the possible directions in which the forms may change this pattern and its requirements must be analyzed.

The difficulty, and near impossibility, to conduct controlled experiments in planning suggests that such knowledge would mainly be acquired through practical experience over a long period of time. The nature of goal-form relationships seem to depend on the specific situation, or the time and the place, to a large extent. Studying these relationships is not a question of discovering constant and consistent laws but a question of gaining an insight into the specific effects of physical forms and the specific requirements of goals within a given context. It is necessary to know the nature of this context and how it might influence given goals and forms. The wider one's experience in dealing with different situations, goals, and forms is, the better insight can one be expected to have.

Case studies analyzing goal-form relationships of past and present planning ventures would be useful because they would make varied experiences available to planners. They would enable the planner to share the experiences of others. The planner would be able to escape the limitations of time and place. Knowledge about how and why events took place in different situations would help assess the existing situation. Knowledge about the effects of similar goals and forms in different situations or the effects of

varied goals and forms in similar situations would add to the ability of the planner to develop forms which would fulfill the requirements of the goals. Case studies of ideal schemes which were put into practice would be especially useful because the process of isolating goals and proposals and of studying their connections is much easier in these cases. This point has already been explained. Such studies would suggest certain ideas about goal-form relationships which could be used as clues or hypotheses in the analysis of more complicated planning ventures. This application of the findings would also serve as a test of their validity.

FOOT NOTES:

1. Benoit-Levy, Georges M., Trans., La Cite Lineaire (Madrid: Imprenta de La Ciudad Lineal, 1913), 11.
2. Collins, George R., "The Ciudad Lineal of Madrid", Journal of the Society of Architectural Historians, XVIII, #3 (Oct. 1959), 38.
3. Benoit-Levy, op. cit., 17.
4. Benoit-Levy, op. cit., 13.
5. Collins, loc. cit.
6. Wood, Edith E., "The Spanish Linear City", Journal of the American Institute of Architects, LX (May 1921), 172.
7. Boileau, Ivan, "La Ciudad Lineal: A critical study of the Linear Suburb of Madrid", Town Planning Review, XXX, #3 (Oct. 1959), 234.
8. Wood, op. cit., 173.
9. Collins, op. cit., 39.
10. Boileau, op. cit., 236.
11. Wood, loc. cit.
12. Boileau, op. cit., 238.
13. Benoit-Levy, op. cit., 25.
14. Benoit-Levy, op. cit., 24.
15. Curtis, Edith Roelker, A Season in Utopia (Edinburgh, New York, Toronto; Thomas Nelson & Sons, 1961), p. 25.
16. Curtis, Ibid., 20.
17. Burton, Katherine, Paradise Planters - The Story of Brook Farm (London, New York, Toronto: Longmans, Green & Co., 1939), p. 25.
18. Curtis, op. cit., 32.

19. Constitution of Brook Farm Phalanx, Adopted May 1, 1845, p.4.
20. Curtis, op. cit., 80.
21. Curtis, op. cit., 99.
22. Burton, op. cit., 176.
23. Curtis, op. cit., 25.
24. Curtis, op. cit., 117.
25. Burton, op. cit., 189.
26. Constitution of Brook Farm, 4.
27. Ibid., 4.
28. Ibid., 6.
29. Brisbane, Albert, A Concise Exposition of the Doctrine of Association (New York; J.S. Redfield, Clinton, Hall, 1843),
"The Edifice".
30. Ibid., "The Edifice".
31. Curtis, op. cit., 175.
32. Curtis, op. cit., 190.
33. Curtis, op. cit., 303.

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