JOERG BARNBROCK
JUNE, 1973

THE CENTER FOR METROPOLITAN PLANNING AND RESEARCH
THE JOHNS HOPKINS UNIVERSITY
BALTIMORE
# TABLE OF CONTENTS

Introduction ........................................................................................................ 1

PART I - IDEOLOGY AND BOURGEOIS SOCIETY ........................................ 4

1.0 Preliminary Remarks .................................................................................. 4

2.0 Concept of Ideology .................................................................................. 4

2.1 The Marxian Notion of Ideology .............................................................. 5

2.1.1 Foundation of Ideology ...................................................................... 5

2.1.2 Production of Ideology ...................................................................... 7

3.0 Technology and Science as Ideology ...................................................... 12

3.1 Introductory Remarks ............................................................................ 12

3.2 Technology and Science as Servants of Capital .................................... 13

3.2.1 Formal and Real Subsumption under Capital .................................. 13

3.3 Science and Technology as "Productive Force" ..................................... 14

PART II - LOCATION THEORY AND SPACE ECONOMY .......................... 21

1.0 Reflections on Space and Space Economy ............................................ 21

2.0 Dialectics of Space Economy ................................................................. 24

2.1 Political, Economic Space and Space of Location ................................ 24

2.1.1 Space Economy and Location Theory ........................................... 25

2.2 Political Economic Space ....................................................................... 26

2.3 On Basic Assumptions of Location Theory ........................................... 27

2.4 Methodology ......................................................................................... 28

2.5 Method of Economic Science ............................................................... 29

3.0 Exploration in Urban Structure ............................................................. 32

4.0 Digression on Externalities ..................................................................... 35
# Table of Contents

## Part III - Retrospective of V. Thünen's Work

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Preliminary Remarks</td>
<td>40</td>
</tr>
<tr>
<td>2.0 The Man</td>
<td>41</td>
</tr>
<tr>
<td>3.0 The Ideal State</td>
<td>43</td>
</tr>
<tr>
<td>3.1 On Method</td>
<td>43</td>
</tr>
<tr>
<td>3.2 On Land Rent</td>
<td>46</td>
</tr>
<tr>
<td>3.2.1 V. Thünen's Perspective</td>
<td>46</td>
</tr>
<tr>
<td>3.2.2 Land Rent from a Marxian View</td>
<td>49</td>
</tr>
<tr>
<td>3.3 On Taxation</td>
<td>55</td>
</tr>
<tr>
<td>3.4 Bourgeois Society as the Final End of History</td>
<td>58</td>
</tr>
<tr>
<td>3.5 The Natural Lage</td>
<td>61</td>
</tr>
<tr>
<td>4.0 The Critiques</td>
<td>67</td>
</tr>
<tr>
<td>5.0 Summary</td>
<td>75</td>
</tr>
</tbody>
</table>

References                                                                 | 78   |

Bibliography                                                             | 90   |
Introduction

The unfruitfulness of two major methodological disputes on the continent at the end of the last century and the beginning of this one led to pragmatism in the judgment of methods. The earlier dispute was the result of the rise of marginal utility theory (Gossen's law), the latter dealt with the dichotomy of normativism and positivism. It was the belief that with Weber's 'purposive rationality' the objectivity of social science was assured. C. Yrdal's critique was Zweck-ittel-senken in der Rationaloekonomie disclosed the subjectivity and value judgment of this disposition. However, ignoring the critique, positivism conquered the sociology of social science.

Explorations in the urban structure under the domination of positivism became a demonstration of what 'is' or 'might be', but the reflection upon the notion of what 'ought to be' was excluded. This separation, interpreted sometimes as 'prognosis' and 'program' in strict dictionary, is artificial and the admission of interdependencies among program and prognosis ends in a circularity around which the investigation of the faculty of knowledge is itself knowledge and cannot arrive at its goal because it is this goal already.

The prevailing new philosophy of Positivism based on a fictitious exclusion of metaphysical preposition reduced science to the business of actual research. This new foundation of science arose out of two developments outside of social science and an internal transformation, the development of basic research in mathematics, the revision of the physical principles and an 'objective' tendency in psychology.

Any scientific epistemological process has to be based on abstractions. Science was, as well, to be legitimated epistemologically. While the former focus on certain methodological questions, i.e., on the method of abstractions; the latter refers to the legitimation of science itself and its object, the absence of an epistemological foundation assumes an uncertainty and an undefined foundation.
of science itself. In general, the scope of experience and method is deduced from
the epistemological object, and when the scope of experience is restricted and
inverted, a certain methodology may legitimate the object. On the general level,
this object is identified by the goal of the socio-economic system. Ideologies
serve to invert or to veil societal knowledge and to postulate harmony among societal
interests.

The foundation of the geography of economy as 'science' is from a recent datum.
V. Thuenen's Isolated State generally is regarded as the first attempt to explain
the geography of location for agricultural land use. In nearly each modern textbook at least reference is given to his model, what is not mentioned is his
dee feeling of 'morality' for a harmonic society. The description of his work
is reduced to a regurgitation of his spacial allocation model, a pure technical
matter. It had been the task in this paper to demonstrate the dependence of his
model on normative judgments. Because a harmonizing conception was employed as
ideological legitimation, it was necessary to analyze the concept of ideology.

To comprehend 'ideology' it had been necessary to elaborate on the notions of
doubling and inversion in a Marxian epistemological process. Such a statement
seems to be ideological as well as to concern with a central metaphysical idea
of harmony. In this study, however, the notion of ideology is viewed as a process.

While part one of this work analyzes the concept of ideology, part two is
concerned with methodology and abstraction in location theory and space economy.
It was the object to demonstrate the inversion of societal knowledge by science
as well as the inappropriateness of its employed methodology.

Modern location theorists still admire the work of v. Thuenen and most of
their work falls under the concept of the Von Thuenen model. Undoubtedly, the
interrelation between von Thuenen's location model and his economic model had
been the first spacial economic achievement, realized in his Isolated State. For
this achievement, the work is to be honored and stands above his predecessors,
represented by Alonso-like models, because an identity between spatial structure and economic system largely is assumed.

The exclusion of v. Thünen's justification of the application of infinitesimal calculus had been due to the focus of this paper. Such a demonstration would presuppose the explication of an isomorphism in the development of mechanics and mathematics and the fixation of human relation in a reactive mechanistic system. In this paper, the interest is reduced to a very broad critique of positivistic axioms. It is not shown that the application of mathematics in social science is born out of a deistic process of reasoning of an epoch. However, the preformulation of the object of knowledge and human relation through deistic beliefs is demonstrated. Thus it can be imagined that the introduction of the infinitesimal calculus in general poses no conceptual problem.

The aspect of deism occupies v. Thünen's central philosophy and serves as legitimation of the modeling of an isolated state. Modern v. Thünen versions are lacking in the central philosophy of its master. Positivism reificated human relation and the question of an ontological legitimation of location theory disappeared.
I. Ideology and Bourgeois Society

1.0 Preliminary Remarks

To understand the relation between ideology and bourgeois society it is necessary first to conceptualize the meaning of ideology and secondly to express the relation between ideology and bourgeois society. Understanding this relationship is a pre-condition of any investigation into the character of societal actions which are veiled by the apologetic use of science and ideology. Therefore, man's spatial behavior and the distribution of man and social labor in space can only be understood when this veil has been removed.

2.0 The Concept of Ideology

The concept of ideology is inseparably bound to Marx's investigation into the capitalistic system. It has, since then, become common and has been introduced into the colloquial language. The concept of ideology can only be conceived within the framework of Marxian theory, however, a slightly different understanding of ideology is pushed forward by Webermas and Abendroth.1

The Ideologists were the representatives of a philosophical school at the end of the 18th and the beginning of the 19th century in France which built on the ideas of Condillac. For the philosophers of this school, formed around Destutt de Tracy and Canabis, a science existed which could describe human perception and sensual interaction and was able to gain insight into the science of ideas by the analysis of physiological and physical organization of men. This science was called ideology. Their main thesis was that the formation and the development of man is dependent on education and external circumstances. In this way, this philosophy is the playground of early French materialism.
The meaning of ideology was changed by K. Marx and F. Engels so that it was used in a negative character. Marx's concept of ideology is bound to the ideological legitimation of certain class interests, which will include the system of societal, political, economic, jurisdictional, pedagogical and philosophical institutions.

2.1 The Marxian Concept of Ideology

2.1.1 Foundation of Ideology

Today writing about ideologies seems to be a superfluous task; depoliticized masses no longer justify any legitimation of domination and society appears as the silent sea of equalized human beings. Technology and science have rationalized human interaction with transformed nature and have reduced man's relation to nature to an instrumental 'purposive rationality' no longer determined by an 'entrepreneur' or capitalist, but by the technical process itself. Any transcendental critique of the prevailing societal system has to disclose first the ideological basis in the development of science and technology, secondly by this to show the apologetic character of science and technology and thirdly to open the routes for a new science, which demonstrates the contradictions between societal production and private appropriation.

In contrast to other attempts in the development of a radical urban analysis, this paper attempts to reassess the Marxian method of inquiry. By this it stands in contradiction to the so-called radical economists in this country of the radical union of economists for which the Marxian analysis is an 'extreme bias' and 'outdated'.

For Marx and Engels the concept of ideology was of conceptual importance for the inquiry into the capitalistic mode of production and served as a basis for their methodology. Thus we will derive the concept of ideology in the Marxian epistemological process, investigate some recent expansion or alteration of the relation of ideology and society and try to investigate the importance of it in the framework of recent and early explorations in the urban structure.
The concept of ideology is derived from the ontological determination of the interaction between the objective and subjective conditions of work. Thus the investigated object is set in an epistemological coherence which has validity only for a certain epoch or society because the objective conditions of work are changing in history. Interaction also reflects the subjective conditions of work, their consciousness and development of knowledge.

The objective condition of work reflects the action and the material condition of the living human individual. Thus the first condition is the living existence of human beings and the first fact to be established is the physical organization of these individuals and their consequent relation to the rest of nature. On this stage the interaction between man and the objective nature in which "men produce their means of subsistence" and thus their material life is perspicuous and corresponds to the conception of objective nature.

The whole mystery of commodities, all the magic and neocromancy that surrounds the products of labor, as long as they take the form of commodities, vanishes, therefore, as soon as we come to other forms of production, e.g., on an island on the development stage of a Robinson economy. Here all the relations between Robinson and the objects that form this wealth of his own creation are here so simple and clear. However let us now transport ourselves from Robinson's island bathed in light to the European middle ages ... Personal dependence here characterizes the social relations of production just as much as it does the other spheres of life organized on the basis of that production. But for the very reason that personal dependence forms the groundwork of society, there is no necessity for labor and its products to assume a fantastic form different from their reality ... the social relations between individuals in the performance of their labor appear at all events as their own mutual personal relations and are not disguised under the shape of social relations between the products of labor.
In this early isolated stage the social relation is clear and not distorted by any veiled social interest. The consciousness here is a true effigy of the being of man and the production of the consciousness is directly interwoven with the material production of life and the material intercourse of man. The conformity of the being with the consciousness of man appears only in a certain situation in which "praxis" itself is not veiled and the interactions of men are direct.

2.1.2 Production of Ideology

For the development of Marx's concept of ideology two preconditions have to be mentioned, one is the doubling of the societal relation within the production of life. This double character appears first on one hand as a natural relation between the objective nature and the subjective relation of social interaction. "It follows from this that a certain mode of production, or industrial stage, is always combined with a certain mode of cooperation, or social stage, and this mode of cooperation is itself a 'productive force'." Out of the societal interaction, "the necessity of intercourse with other men" and the relation with nature consciousness arises.

The doubling of the social relation (between object and subject) on one hand and 'symbolic interaction' is of central importance for the later Marx and the understanding of the well known expression of the formulation of the relation of basis to superstructure and ideology and of the relation between being and consciousness.

In this early stage of history, consciousness emerges from the identity of nature and man and their interaction. Here, however, nature is still objective, not converted by social labor. Marx speaks in this relation of a consciousness of nature "which first appears to men as a completely alien all powerful and unassailable force, with which men's relations are purely animal and by which they are overawed-like beasts, it is thus a purely animal consciousness of nature (natural religion)." Because nature has not undergone any historical transformation in this primitive stage, social interest is not veiled by any ideological legitimation. For the appearance of any ideological
legitimation it requires the separation between the identity of nature and men and leads to the second precondition for the development of Marx's concept of ideology.

The natural division of labor in the primitive stage of history has to be distinguished from the division of labor into material and mental labor. "From this moment onward, consciousness can really flatter itself that it is something other than consciousness of the existing practice, that it really represents something without representing something real; from now on consciousness is in a position to emancipate itself from the world and to proceed to the formation of 'pure' theory, theology, philosophy, ethics, etc." Only with the division of labor in mental and material labor can the perversion of the material existence of men emerge so that a converted effigy of reality in the form of ideological justification can appear. Now men and their social relation can be converted as in a 'camera obscura'. However, the consciousness never can be different from the natural existence in its two fold relation but with the division of labor reality can be reflected in a different manner. The ideologists undertake the task to mystify and veil the societal relation and the relation between nature and man. Ideology is an addition to the material production of life but without the interaction between consciousness and being, thus ideologies exist without history. Morality, religion, metaphysic and all the other aspects of ideology are only independent in appearance. This is meant by the expression 'ideologies exist without history'. Ideologies possess no autonomy other than the relation of production and material exchange between man.

This result of the division of labor also reflects the separation of the basis, relation of production, and superstructure of social, political, philosophical and jurisdictional institutions. This doubling in basis and superstructure on one hand and the twofold character in the relation of object and subject on the other hand screens the societal perception.
Two distinct levels are differentiated here, which lead to the twofold determination of ideology. One is embedded in the individual level, in the domination of foregone labor (means of production) over the existing labor, as domination of things over man. The other appears on the general level in the relation between basis and superstructure.

It is of conceptual importance to realize this double determination to understand later the role of technology and science in this framework. This is rationalization from below and from above by the separation in basis and superstructure. The individual perception, the consciousness of one's own existence, can be veiled from this double relation.

As early as in the *German Ideology* Marx realizes this twofold determination in the mystification of societal consciousness. "If in all ideology men and their circumstances appear upside down as in 'camera obscura,' this phenomenon arises just as much from their historical life process as the inversion of objects on the retina does from their physical life process." These delusionary delineations of reality, the inverted relation of subject and object, which is determined by the real societal process of life, reverse nature and the relation of men to nature and also the interrelation among men. From this it follows that each ideology is a false representation of history or an abstraction which pushes aside history. To intangle the mystification of the consciousness and to disclose the societal relation it is necessary to commence with the material precondition of life. Then "Morality, religion, metaphysics, all the rest of ideology and their corresponding forms of consciousness, thus no longer retain the semblence of independence."

The aforementioned division in mental and material labor and from this the developing possibility of a different distribution of the benefits of labor leads to the possibility of contradictions. By this division of labor, the contradiction emerges between the interest of the individual and the societal interest. For Marx this contradiction is the central point for the uprising of a societal interest and the state, as a different entity from both the individual and societal interest.
Because the division of labor presupposes further the existence of a certain distinct class, the state is the expression of the domination of one class over the other. This separation of the state received its highest development in capitalism, as the organ of the domination of capital over the working class. The legitimation of domination of one class justifies the incomplete understanding of reality. Although it is impossible to maintain that ideology is only falsehood and deceit but the result of the contradiction within society, the task devolves upon the ideologist to generalize the idealistic conditions of the existence of the dominating class in a way that they are integrated into the perceptions of the suppressed class.

We have to add here as a general precondition for any possible inversion of societal knowledge which may veil the consciousness that language has the task to serve as mediator between the interacting individuals. "Language is as old as consciousness," no consciousness without language because the language is the practical consciousness. The development of a pure consciousness, as the result of the division of labor, reflects the immediate consciousness. If, however, this abstract imagination comes into contradiction with reality (the forces of production), that the contradictions have been introduced into the social relations, division of labor and societal organization of work, then there is no alternative to change historical development but by infiltrating the immediate consciousness of the living individual, ideologies hinder knowledge of the contradiction.

This transformation in the knowledge of the relation between subject and object is doubly assured. "It is the same relation in the material production as the real societal process of life, for this is the process of life which is described on the ideological level by religion as the inversion of the subject in the object and vice versa." With the development of the forces of production, men come under the domination of an alien power "(a pressure which they have conceived of as a dirty trick on the part of the so-called 'universal spirit', etc.) a power which has become more and more enormous and, in the last instance, turns out to be the world market."
This unclear description of the subsumption under an alien force, which Marx describes here in the German Ideology, is identified with world market, which presupposes the separation of capital and labor and competition between them. Later it becomes evident that Marx identified capital as the material substratum of the homogeneous subject of bourgeois historical philosophy. This substitution of world spirit for world market presupposes the competition of capital and the division of labor. This is described in the German Ideology but is much more elaborated in the Grundrisse. 19

Obviously Marx doesn't here include competition between the action of individual capital, which belongs to the immediate utilization process but under its general conception. Free competition is for Marx the relation of capital to itself as another capital, that means the real conduct of capital as capital. 20 It is not the relation of individuals to each other, as repulsion or attraction of free individuals but the relation of capital in its general conception. Individuals are not set free in competition but capital is set free and gains the meaning of an independent power. The reflecting subject cannot realize this mystification because individual freedom is inverted and appears as the freedom of capital. "This kind of individual liberty is thus at the same time the most complete supression of all individual liberty and the total subjugation of individuality to social conditions which take the form of material forces - and even of all - powerful objects that are independent of the individuals relating to them." 21

The reification of the societal relation and the resulting mystification of the relation of the individual reaches its highest stage of development under capitalism. So far we have developed Marx's framework of ideology. What is left open is to determine how science and technology serve as an ideology to perpetuate and to veil the knowledge of societal relation.
3.0 Technology and Science as Ideology

3.1 Introductory Remarks

It is essentially the aforementioned substitution of a central world view of capital from which Habermas\textsuperscript{22} starts to explain how technology and science serve implicitly as legitimation of power. For him the term traditional society differs in three respects from more primitive social forms. "1. A centralized ruling power (state organization of political power in contrast to tribal organization). 2. The division of society into socio-economic classes (distribution to individuals of social obligations and rewards according to class membership and not according to kinship stratus). 3. The prevalence of a central world view (myth, complex religion) to the end of legitimating political power—thus converting power into authority."

In the development process of capitalism this legitimation of power from the heights of cultural institutions breaks down. The new legitimation of power arises from the relations of production. By this the legitimation is established in the productive forces. "Thus on the base of a market economy, political domination can be legitimated henceforth from below, rather than from above (through invocation of cultural tradition)."\textsuperscript{23} Essentially the legitimation of power from 'below', from the relation of production, paralyses the class conflict, which for Habermas has not disappeared but has become latent.

The investigation into this topic is for this work of conceptual importance. The interest here is how science and technology or better, spatial science and positive economics, serve as an ideological condition for the conversion of the subject-object relation and perpetuate the status quo in the form of the domination of capital over social labor.
3.2 Technology and Science as Servants of Capital

The division of labor multiplies the productive forces and converts them into an alien force, existing outside of the individuals. Under capitalism, this inverted relation appears as the subsumption of the process of work under the process of utilization of capital. Marx called this the formal subsumption of work under capital, differentiated from the real subsumption.24

3.2.1 Formal and Real Subsumption under Capital

Real subsumption appears as the alternation in the relation of the combined individuals in the process of work. In the earlier process the master was the master of handicraft in his relation to the journeyman, now they stand opposite to each other; the one as the owner of capital, the other as the seller of labor power. Outside of the process of production they are related to each other as owner of commodities. Within the process, they appear as personified functionaries of this process. In this relation the self-utilization of capital is embedded. Labor appears as a mere factor of this self-utilization. This transformation of the societal process which Marx locates in the 16th century25 is the production of wealth by the expansion of the time of work to create surplus value (absolute surplus production).26 The lower limit on this relation of production is the reproduction time of labor power.

With the production of relative surplus value in the form of a tremendous intensification of work, which is not brought about by the expansion of the time of work but by the application of new technology, the organization of production is changed and the specific capitalistic way of production can emerge. Marx called this the transformation which is brought about by the intensification of work or relative surplus production,27 the real subsumption of labor under capital.28

The limit to the expansion of production is by no means set by the time of reproduction of labor power but by the time of circulation of capital, as the time of depreciation of capital. The destruction of all local barriers, the destruction of
space by time, the conquest of the earth as market, is the result of this subsumption. The revolution of the forces of production has a twofold determination. One is the immediate process of production, which is transformed by the intensification of the process of work; the other determination is the expansion of the local barriers of intercourse in space and time. The new mode of production has destroyed all the old relations on which the 'Gemeinwesen' community had been based and which has been idealized by religion or ideology. The new form of idealization appears in the mystification of capital.

The relation of capital as dominating force has changed fundamentally; it is not based any more on personal relations of domination and dependence but arises simply out of the technical organization of production. This short differentiation sets the framework for the method of treatment of science and technology as ideology.

3.3 Science and Technology as 'Productive Force'

The production of societal wealth under the formal subsumption of labor under capital is based on the expansion of the time of work; the real subsumption of work under capital has changed this relation. The division of labor as the societal force of production no longer applies to the transformation of the Gemeinwesen (community). The conscious application of science to the immediate process of production has brought about this change of the forces of production. No longer is surplus production dependent on the exploitable surplus labor but on the internal organization of the process itself. Nature itself does not create machinery, assembly lines, etc. They are the product of conscious human volition (over)nature or its utilization within nature. It is important to state here that science as such, as general knowledge about nature, cannot be regarded as a productive force, only if it is integrated into the immediate process of production - as materialized technology and science, does it serve as a productive force. This is the conscious application of natural science, mechanics, machinery or economics to the immediate process of production for certain aspects.
It appears not as the productive power of labor, neither of the individual laborer nor the social combined labor but as the productive force of capital.\textsuperscript{30}

With the development of modern industry the production of wealth is less dependent on the time of work and the quantity of necessary labor time but more on forces within the immediate process of production which is dependent on the general level of science and technology and the use of these agents in production. On the other side, the development of science and technology, especially natural science, is put into relation with the development of material production.

Further, this new constellation has changed the object-subject relation. "Real wealth develops much more (as is disclosed by heavy industry) in the enormous disproportion between the labor time utilized and its product and also in the qualitative disproportion between labor that has been reduced to a mere abstraction and the power of the production process that it supervises. Labor does not seem any more to be an essential part of the process of production. The human factor is restricted to watching and supervising the production process . . . The worker no longer inserts transformed natural objects as intermediaries between the material and himself. He now inserts the natural process that he has transformed into an industrial one between himself and inorganic nature over which he has achieved mastery."\textsuperscript{31} It is what Marx called the 'contradiction inaction' of capital\textsuperscript{32} because it reduces the necessary labor time to a minimum. On the other side, it maintains the time of labor as the "only measurement and source of wealth. On the one hand it calls into life all the forces of science and nature, as well as those of social cooperation and commerce in order to create wealth which is relatively independent of the labor time utilized. On the other hand it attempts to measure, in terms of labor time, the vast social forces thus created and imprisons them within the narrow limits that are required in order to retain value already created as value."\textsuperscript{33} The object of production under capitalism is not determined by the needs of society although the development of the material forces have reached this stage but the subsumption of the societal relation and
productive forces under the domination of capital. It is the further development of
the mystification of capital as capital which is embedded in this relation.\(^{34}\)

In earlier times religion, metaphysic, philosophy, etc., screened societal
knowledge; today ideology appears in form of the mystification of the capital labor
relation and the ideology has become a part of capital. The social productive force
of labor appears as the productive force of capital, as a distinctive characteristic
of capital. Marx summarizes this relation under a threefold determination.\(^{35}\)

1. The first one is the separation of the social relation in the form of the
appropriation of the product of labor by the capitalist on the individual level and
the appearance of the societal combination of labor power as the form of capital on
the general level.

2. This inversion (point 1) of the social combination of labor power develops as
a historical process and thus gains the character of an inherent capital relation.

3. The third determination is the transformation of the objective condition of
labor, which has changed its manifestation in the history of capitalism. This trans-
formation of the condition of labor gains autonomy in the form of the existence of
capital, separated from labor. Machinery, as a form of the objective condition of
labor, gains independence from its creators. "Science as the general product of
societal development appears incorporated into capital (the application of science,
separated of the knowledge and capability of the individual worker on the material
process of production) and the general development of society appears as the develop-
ment of capital because this development effects from capital opposite to labor and
it appears the more the less because the depletion of the capability of work proceed
parallel for the majority with this process."\(^{36}\)

This result is the same as with the old ideologies; however, it has become
transcendent under capitalism. The transformation of consciousness is based on the
transposition of the societal forces of labor under the reificated character of
capital, so that machinery, applied science, etc., in their dominant form appear as
the necessary form of capital. Capital uses this means only as means of exploitation
and to exploit labor it has to apply labor in the production process. In this
framework, Marx writes "capital is productive.”

It is essentially this subordination of science and technology in capital where
the analysis of Habermas and Marx differs in a certain respect. For Habermas the
"disenfranchisement and pauperization of the masses no longer coincide with exploitation
because the system does not live off their labor. They can represent at most a part
phase of exploitation." This further is the reason for Habermas why the class
conflict has become latent. For Marx the subsumption of science and technology
appears as the "processing contradiction.”

What for Marx had been the doubling of the objective contradiction of capital,
for Habermas is the annulment of the labor theory of value. He doesn't reflect that,
in the very moment when human labor would disappear from the immediate process of work,
the foundation of capitalistic production, production based on exchange value, would
be removed. Consequently, the Marxian theory can no longer be applied to 'modern
capitalism' because the creation of societal wealth is based on "controlled scientific
technical progress", itself, and this is the new basis of the legitimation of power.

Technology and science don't serve as ideology per se but gain the character
of ideology with their subsumption under capital. This we can agree to Habermas' 
observeration that the "technocratic consciousness is on one hand less technological
than all previous ideologies" and on the other hand, "today dominant rather glassy
background ideology which makes a fetish of science is more irresistible and farther
reaching than ideologies of the old types." This opens the way for a subsumed
science as ideology and the mystification of societal relations as a natural process
is embedded in the process of the development of a science.
What is still left open is the characterization of science before we can proceed. In general, we find the differentiation of science into two branches which predominately are called natural science and social science. Under the notion of natural science, the pursuit of knowledge of an objective nature is assumed. Others have argued that such a differentiation is highly artificial because the 'universe' doesn't follow the partitioning of science into different branches.

Francesco Vito refers to this respect to an understanding of science in its totality. However, for him, this demand for unit of knowledge includes the danger of a non-further development of knowledge. The reason for this lies in the differentiation of the object of inquiry itself which requires certain methods for each object of research. He especially envisages the danger in the field of economic science where each distinction between natural science and social science is eliminated and the method of the former is applied to the latter.

Milton Friedman may stand as representative of the identity of the two branches of science. For him 'positive economics' is or can be an objective science in precisely the same sense as any of the physical sciences. These analogies with natural science imply that the 'economic laws' of capitalism are natural laws. The capitalistic society is according to 'his' beliefs as eternal as nature. "Bourgeois economists in pre-revolutionary Russia thought this too - until nature played them a nasty trick."  

What we can gain from the aforementioned and more or less unsatisfactory explanation is that neither view is comprehensive enough to explain the task of science. For the dialectical theory this problem doesn't exist. "We only know a single scientific method of science of history. History can be looked upon from two sides and can be separated into the history of nature and human history. Neither can be separated; as long as men exist, the history of nature and the history of man condition each other."
The central contradiction between the dialectic theory and positive science, however, is less the view of history than the unity of form and content. In the dialectical theory, form and content are not viewed external to each other. The externality of form, opposite to the content, will deform the content. That means, e.g. for the positive economist may perform content to fit anticipated categories so that the methods of investigation are inherently determined. This preformulation of the content occurs without conceptual discussion. If this view is correct, then Marx's 'metaphysics', as J. Robinson calls Marx's method of unnecessary addition absolutely superfluous for the process of knowledge, is reversed and we have to ask ourselves whether the so called positivity of positive science has its roots in an artificial separation of the process of knowledge itself. Consequently, we may add that this separation can only exist in the form of a bad metaphysic or gain the form of a methodology when it is borrowed from pure science, the natural sciences.

The categories are conceived as outside of the field of science while for Marx this was one of the central questions of the epistemological process - what is behind the categories; what is the specific content of the economic determination of forms? In this framework, the *Grundrisse der Kritik der politischen Ökonomie* or *Rohentwurf of das Kapital* has to be regarded as the central contribution to the knowledge of categories and the dialectical method in general.

Indeed that existence determines the consciousness, is the often quoted Marxian phrase, but also he states: "Men make their own history, but they do not make it just as they please, they do not make it under circumstances chosen by themselves, but under circumstances directly encountered, given and transmitted from the past. The tradition of all the dead generations weighs like a nightmare in the brain of the living." If we transform this knowledge to the notion of historical science, we can gain a nearly identical structure of science as Th. S. Kuhn develops in his book *Structure of Scientific Revolutions*. For him a normal science is described as a puzzle-solving activity within the framework of a shared paradigm which consists in
shared beliefs, theoretical rules or scientific tradition. Transformation of paradigms can yield gestalt of scientific revolutions or counterrevolutions. However, these transformations cannot be independent of the development of the relations of production, as well the transformation may affect the relation of production. This unit between material basis and knowledge and their contradiction is essentially the fundamental difference between the epistemology of historical dialectic materialism and the historical dialectic of Kuhn.
PART II - SPACE ECONOMY AND LOCATION THEORY

1.0 Reflections on Space and Space Economy

The notion 'space' is already an abstraction. Any philosophical inquiry into the notion of absolute space does not lead to any valid results. It only seems to gain any useful meaning in relation to something like economic space, perceptual space, organic space, or social space and so on. Certainly we can attach certain functions or dimensions to the notion of space, like distance or interaction. But with notions like economic space or perceptual space we are still at the level of abstractions. In addition we may enclose man, who performs his interaction with nature and symbolic interaction in space and time. However, we discover that man presupposes history, without history, which presupposes the existence of living human individuals. There is no interaction with nature or 'symbolic interaction' of men. We find that the functions of the living individual within his societal context as in space have changed in the history of men. The primitive man conceptualized space in his interaction with objective nature differently than the modern industrialized man. Divided into classes within society under industrial capitalism, space may reflect the different economic functions within society. "For members of the working class, who commute to work out of the area where they are living, space is a constraint which has to be overcome and the cost of doing so is an added economic burden on the family ... By contrast, for a section of the middle class, space, far from being a constraint, is valued as an amenity which should be preserved. Space may become a symbol of a certain style of life to which such middle class people aspire and the economic burden of crossing it in order to reach urban employment and amenity is an accepted concomitant of their way of life." What becomes obvious is that the conception and adaption of space is viewed differently according to social class.
The perpetual transformation of 'physical space' by social interaction (work) changes the symbolic interaction among individuals, which reflects by social interaction the 'physical space' and the physical basis. The conceptualization of space and knowledge about it is invariably bound to the living individual, which performs its function always in space and time.

Under capitalism as we have seen, a certain class has come under the domination of an alien force, "which alienates nature from man and alienates man from himself, from his own active functions, his life activity, so it alienates him from the species." With the real subsumption of labor under capital, labor has become the appendix of capital which it has produced. "Labor produces the conditions of production as capital and labor capital produces and the worker as means of its utilization as capital, as paid labor."

For capital, space is a friction for the utilization of capital. Capitalistic production is based on exchange value and hence on exchange itself. Exchange consequently depends on the development of the means of communication and transportation. In a particular stage of the division of labor, it becomes necessary to provide means of communication when capital is exchanging commodities across territorial frontiers. The realization of the surplus value and the reproduction of the capital relation is highly dependent on the actual time spent on the distribution of the immediate product as part of the immediate production process. "The destruction of space by time" is the ultimate object of spatial behavior of capital. However, with the development of capitalism the realization of surplus has become less dependent on the actual time spent in the circulation of the product, while the surplus production has been dependent on the circulation time and circulation time on the production of the means of communication conditioning the surplus production.
The removal of the direct relationship of labor from its products of labor has become external to the labor power. The inversion of the societal relation especially indicates that the activity which transforms human species into labor power, by which they can be differentiated from animals, has turned out to be the means to remove this difference. "The worker, therefore, feels himself at home only during his leisure time where as at work he feels homeless ... . We arrive at the result that man (worker) feels himself to be freely active only in his animal functions - eating, drinking and procreating or at most also in his dwelling and his personal adornment - while in his human functions he is reduced to an animal. The animal becomes human and the human becomes animated." Only with this understanding of the human inversion can any investigation of social activity in space be considered and only in this way can it produce a valid result; it is the alienation of man within physical space and from social space.

The indicated epistemological process differs quite distinctively from those to be found in conventional textbooks. But let the apologists of 'positive science' speak for themselves. Chadwick starts from a 'central philosophy' spreading outwards "in a logical and coherent manner. This philosophy is that of a systems view of planning .... as a basis for a general theory of planning." The sort of planning he is concerned with "involves the arrangement of spatial pattern over time," where spatial pattern is understood as the arrangement of space of all kinds. This is what Engels called "a new twist to the old favorite ideological method, also known as the a priori method, which consists in ascertaining the properties of an object by logical deduction from the concept of the object instead of from the object itself. First, the concept of the object is fabricated from the object, then the spit is turned around, and the object is measured by its image, the concept. The object is then to conform to the concept, not the concept to the object." Space has to conform to the system view of planning as the central philosophy. Spatial arrangement is regarded as a system between the receivers and transmitters. Was it not then the Russian revolution which played nature a nasty trick.
2.0 Dialectics of Space Economy

2.1 Political, Economic Space and Space of Location

Space is a concept often described and little understood because very few scientists started from the real basis which makes space relative. Mostly they start from an idea of space or a concept of an abstract space. The real basis of society, the relation of production, which reflects the political superstructure, social and political institutions, is organized in time and space and, as well, the social and political institutions gain a spacial dimension in the form of 'national spaces'. "The basic forms of all being are space and time and being out of time is just as gross an absurdity as being out of space." The material existence of man provides us with the real basis of each scientific inquiry and man only can exist in relation to material objects, his material conditions of life. The material conditions of life under which men are producing and exchanging are constantly changing in the history of human existence, as well from country to country. "Political economy, in the widest sense, is science of the laws governing the production and exchange of the material means of subsistence in human society. Production and exchange are two different functions. Production may occur without exchange but exchange - being necessarily an exchange of products - cannot occur without production." The spatial component enters this definition with the existence of exchange. Only with exchange of commodities can economic space gain any useful meaning. With the capitalistic mode of production, exchange not only means exchange of commodities, conditioning the utilization of capital, but also exchange of capital and labor. Both processes are happening in space and time. Marx differentiates them in the form of simple circulation and expanded circulation, the circulation process of capital, while the former deals with the exchange process of capital and the 'commodity labor power'. "Through exchange process with the laborer, capital appropriates labor itself; labor has become part of capital and imparts life to capital's pure and otherwise dead existence."
2.1.1 Space Economy and Location Theory

While purse economics in general is spaceless, spatial economics deals with the "geography of man's economic activities." However, it can't be the 'pure analysis' of "what, where, when, for whom and why," because man has made his own history "and the real duty of the economists is not to explain our sorry reality but to improve it."

Location theory 'in general' is the occupation of the organization of production, circulation, consumption and distribution in space and time. The first of these components (space) is often mentioned; the latter refers to the economic organization and stage of technological development reached under a certain mode of production. Consequently there is nothing like a general theory of location. The locus of spacial organization is a function of the mode of production, in general, and the capitalistic mode in specific. Principles of location must start from the laws of the capitalistic mode of production as these are the central aspects of modern capitalism.

A. Weber, generally regarded with v. Thunen, Roscher, Launhardt to have formulated one of the first attempts of a 'pure' theory of industrial location, describes one of the characteristics of modern capitalism as "degrading labor into a commodity bought today and sold tomorrow" and from the insuing laws determining the labor market (Gesetze der Arbeitsmarktgestaltung) and from the local 'agglomerations of workers' created thereby. This agglomeration of workers produces by necessity the particular kind of industrial aggregation which we find today and which I shall call progressive agglomeration of industry."

It is not the task here to revise, report and comment on his location of industries, others have done this already. The interest of this work focuses on certain ideological aspects of location theory, not on the evaluation of the theory, but on their societal view of the social process.

Another view of the Weberian approach, where modern location theorists would hardly agree, is his understanding of wages. He writes, "the labor costs of an industry ... are ... the expenditures of human labor incurred in carrying out the particular process
of production. They appear in the capitalistic system as wages and salaries which are paid out in the course of the production process and denote the 'equivalent' of labor used. It is obvious, of course, that human labor is not paid with wages because it is something different from a commodity."  

He, however, deals with economic phenomena in their concrete form; consequently, he doesn't question whether wages and salaries are equivalents, but it is assumed that his point of view is clear.

2.2 Political Economic Space

An important aspect of economic space is its relation to political or national space (Wirtschaftsraum). Francois Perroux criticizes the illusion of a coincidence of political space and economic space. The identity of political space and economic space arose to conceptual importance in the thirties in Germany. In a speech on occasion of the Reichsgrundungstages (18.Jan., 1934) the well known location theorist A. Predohl deals explicitly with the relation of political versus national space. His central topic was to what extent the nationalization of the economic space can be preceded with political and economic means and can reach the general equilibrium of political and economic space. The "dynamic forces of capitalism" expanded, favored by liberal economic policies in the 19th century, and became dominant. His interest is directed to the question for which economic sectors nationalization is possible without any major difficulties, and he states that the possibilities of nationalization of economic space in the most typical cases (he deals with) are not favorable to bring national space and economic space to a congruity in Hitler's Reich. Further, each economic-political judgment is based on a norm which is founded on a portion of a world outlook. For him this norm, preformulated in a general idea - especially in Germany - is the hypothesis that the economy has to be integrated and subsumed under the totality of the society and state or simply under the idea of national socialism. So he concludes,
"as in all other areas of our political life, we can look forward with confidence also on this matter (economic space) to the future, then before the end of the last year" (1933) 74

As always, somebody will excuse A. Predohl's highly ideological statements. The crux is that only five years later somebody tries by force to remove these differences between economic and national space "for the nation with space". Further it might be argued that such statements might have been the result of a social consciousness and not the free expression of the scientist.

However, the central topic here is that location theory served or implied ideology from the very beginning. In the next chapter we try to give an overview of some of the explanations of the urban structure by recent location theorists.

2.3 On Basic Assumptions of Location Theory

Location theory conventionally is described as the analysis of "alternative locations for specified kinds of activities," such as industrial, residential, retail and so on determining economic factors for any spatial differentiation and location. Theories are mainly grouped into free factors: "1. external and internal economies or indivisibilities, 2. the demands for land inputs and, 3. transportation costs." According to the general wisdom explanatory models of spatial differentiation are based on these three factors. Another assumption for the explanation of the spatial structure, implicit in all economic spatial models, is the ruling economic doctrine neo-classical or neo-Keynesian. I guess it can be generally agreed that the greater part of research falls in the categorial aspect of the neo-classical school.

In the sixties, especially in the United States, there emerged a substantial amount of literature on urban development and explanatory models in the urban spatial process and form. Models in general can be classified into static and dynamic models or according to their purposes. Mills classifies urban models in "a. spatial structure
models, b. growth models of urban areas, c. public policy models." Further he concludes "a well formulated general equilibrium model is a precondition for a useful dynamic model and characteristics of equilibrium positions tell us something about the dynamic adjustments" and both distinctions are "more complementary rather than competitive." Before we proceed, it is necessary to discuss some of the crucial assumptions implicit in all neo-classical models, however, before some remarks on methodology.

2.4 Methodology

An important question of each scientific inquiry, a general precondition, is primarily the methodological question. In the multi-differentiated realm of science, this question appears at the beginning of each inquiry and will precondition not only the process of work but also the result.

The main difference between theory and method can be summarized as: the properties of a theory or law have the character of an affirmative proposition and the main purpose is to represent reality; while methods have a character of request and are directed at the transformation of or knowledge of reality, by this they are conditioned by a purpose or goal. This purpose or goal, however, doesn't exist independently of societal interest; they are set by human interest. These characteristics of a method have the result that they are based on a theory or part of a different theory and thus finally on 'objective' laws which are to be found in certain stages of history. The necessary condition of each method is the existence of an 'objective' causal connection between relationships and knowledge in gestalt of a theory.

From a systematic point of view, methods are based on theory, rules or laws. However, in a historical context, this relationship becomes much more complex. To create a theory, you need a method and you need a method to create a theory. This paradox can only be untangled by the Marxian theory of knowledge, which can grasp with its knowledge of the importance of praxis in the epistemological process the 'Processhaftigkeit' in the realization of knowledge. The development of theory and method develops in permanent
interaction between it and the objective reality on the other side. However, the epistomological process may be veiled by tradition of the previous process. Consequently, the final criteria only can be praxis, which is understood as societal praxis.

2.5 Method of Economic Science

Each social science is based in one or the other way on abstractions to inquire the essentials and to describe complex reality. Abstraction in itself doesn't help to gain knowledge, it is of conceptual importance from what it is abstracted and from what it is not. As described earlier, the method of abstraction is undoubtedly bound to the purpose of knowledge.

Marx's interest was to reveal the economic law of capitalism while for the modern economists the field of interest is "the study of how men and society end up choosing ... to employ scarce productive resources which would have alternative uses." These different goals consequently will result in different methods of abstraction. For M. Dobb there are "broadly speaking two roads along which one can proceed. In the first place, one may build one's abstraction on the exclusion of certain features which are represented in any actual situation, either because they are the more viable or because they are quantitatively of lesser importance in determining the course of action. Secondly, one may base one's abstraction not on any evidence of fact as to what features in a situation are essential and what are inessential, but simply on the formal procedure of combining the properties common to a heterogeneous assortment of situations and building abstraction out of analogy." In essence, Marx and the classical economists proceeded along the first method, while the second can be attributed to the 'modern' economists.

With the relation of scarce means and alternative uses, the object of knowledge is preformulated in a way that the relation of thing to men is fixed. Such a proposition hardly can gain any knowledge of the law of capitalistic motion. When a science, which traditionally understands itself as a social science, excludes certain societal
conditions, preconditions, relations and interdependencies from the scientific analysis, then the question may be raised as to the legitimacy of such an abstraction.\textsuperscript{84}

Marx was specially anxious about the application of his theory to all historical epochs. He writes, "even the most abstract categories in spite of their applicability to all epochs - just because of their abstract character - are by the very definiteness of the abstraction, a product of historical conditions as well and are fully applicable only to and under those conditions."\textsuperscript{85}

\textit{Milton Friedmann in Essays in Positive Economies} outlines the methodology of positive economics. The first differentiation for him is the distinction between \textit{normative economics} and \textit{positive economics}. "The ultimate goal of a positive science is the development of a theory or hypothesis that yields valid and meaningful (e.g. not truistic) predictions about phenomena not yet observed,"\textsuperscript{86} while for him \textit{normative economics} is an art that 'ought to be' based on \textit{normative judgments}. However, between both there is an interdependence in a way that any predictions must be based on positive economics, the objective science, in precisely the same sense as any of the physical sciences. Each theory or hypothesis consists of a body of assertions and abstractions of certain phenomena and forces of the real world, but it is of essential interest from what is abstracted. For Friedmann, a hypothesis or theory consists of two parts. "First a conceptual world or an abstract model simpler than the real world and containing only forces that the hypothesis asserts to be important, second a set of rules defining the class of phenomena for which the model can be taken to be an adequate representation of the 'real world' and specifying the correspondence between the variables or entities in the model and observable phenomena."\textsuperscript{87}

In the first description falls what Marx called Robinsonades of political economy. These abstract models are not simplifying the real world phenomena but are abstracting totally from them. To describe real world phenomena, for Robbins, it is useful to go behind 'such relationships and invoke the operation of those laws of choice which are best seen when contemplating the behavior of the isolated individual."\textsuperscript{88} Consequently,
the existence of the revenue, as it appears on the surface, is separated from its inner
relations. Thus, land becomes the source of rent, capital the source of profit and
land the source of wages. Marx attributed this to the vulgar economists of his time,
but I guess it can easily be expanded to the subjective theory of value as the dividing
landmark between the classical and neo-classical school, of the utility theory of
Jevons and the Austrian school and opened the development of the marginal productivity
theory for the three factors of production in a harmonizing concept. Social relations
are formed in the process of exchange, where each actor or factor tries to optimize
marginal utility. This differs in one respect from the Marxian process of knowledge
where the immediate production process is the basis of social relations. Further, the
marginal productivity theory implies via fetishizing competition that each factor of
production receives "the equivalent of what is created." As we will see such a
concept of natural distribution among the factors of production has been the result of
a certain way of abstracting from reality.

The second remarks here should deal with the rules or axioms described by
Friedmann. Positive economics starts with the assumption that individuals via exchange
are trying to maximize their utility and preferences. The growing use of mathematical
methods within positive economics is mainly based on three axioms (rules) and can only
do so if the axioms are valid. These axioms are generally summarized as the inform-
ation axiom, rationality axiom and reaction axiom.

The information axiom implies that all subjects are perfectly informed. The
validity of this axiom implies the existence of a utility function $U(x_1, x_2, x_3, \ldots x_n)$. It is obviously implicitly assumed that all decisions of the subjects are determined
before they can be determined based on a performed action.

The rationality axiom is based on the hypothesis that all subjects are acting
rationally so that the utility function can be maximized under certain constraints.
The proposition is a formal congruency of the mathematical extreme value problem
and rational economic behavior. It is the substitution of problem analysis for
definitions. The maximum of a goal function is the optimum. This leads, consequently, to an identification of rational behavior and the maximum principle which is based on a pure definition. Thus each economic choice can be justified with the maximum principle.

The third axiom is based on the assumption that economic actions are happening with infinite speed, or mathematically expressed, indifference curves are steady and differentiable. Here it is preconditioned what should be proved because implicitly the functional interdependencies between economic dimensions is presupposed and by this the existence and determination of an optimal decision.

To summarize, it is the sacrifice of social science on the altar of mathematical science. This, however, doesn't imply that the use of mathematics within itself is all nonsense but only in respect to the aforementioned relation. The economists express the relation of bourgeois production, the division of labor, credit, money, etc., as fixed immutable, eternal categories ... Economists explain how production takes place in the above mentioned relation, but what they do not explain is how these relation themselves are produced, that is, the historical movement which gave them birth.94

3.0 Exploration in Urban Structure

In this paper our interest is less directed to the technics of location theory than to their general conceptions, their abstraction of the object of knowledge. Further, we limit ourselves to the urban area, not to regional location theories - why certain activities prefer to settle in this or that region or urban places and repulsion or attraction of certain cities - but on the internal structure of cities themselves. However, such division seems to be artificial and certainly between the two there exists an interdependence.

Early description of the urban structure of cities is associated with the concentric zones, sector, and multiple nuclei theory.95 The concentric zone theory differentiates five distinct zones within the city. 1. The central business district, the nucleau of the
city, as focus of commercial, social and civic activities, 2. the zones of transition, where residential use is declining and is substituted for other activities, 3. the zone of independent working men's homes, inhabited by industrial workers who escaped the zone of transition, 4. the zone of better residencies, mainly existing of single residential homes, and 5. the commuter zones stretching out beyond the city limits along main commuter lines and inhabited by high class residential areas.

Hoyt's sector theory is based on the importance of transportation along with four differentiated kinds of land use that have developed. Central to this theory is that the substitution of land uses originated near the center and migrated outwards toward the periphery.

The multi-nuclei theory is based on the assumption that land use pattern is not built around a single center but around several separated cores of different activities. This is based on empirical evidence that certain urban functions need specialized facilities. On the initial stage of the city, a single nucleus existed, while the rise of separated nuclei and differentiations reflect a continuation of four factors. 1. as mentioned, certain urban activities require certain specialized facilities, e.g. water or rail connections, and 2. interdependencies of operationalized facilities, which led to a grouping together, 3. the detriment of certain unlike activities to each other, and 4. internal structure of certain activities, like large space requirements which may exclude favorable high rent areas.

The first explanation of urban areas, which usually is attributed to Burgess and Park of the Chicago School of Sociology, seems to be older than their investigations. Exactly the same phenomena is described by Eberstadt,96 or as early as the writing of F. Engles, noted in his Conditions of the Working Class in England in 1844.97 These early descriptions of the urban structure didn't offer any theoretical reasoning behind their arguments, their evidence was mainly based on empirical facts.
Urban spatial allocation theory grew to significant importance after the Second World War in the capitalistic countries. The urban decay urgently demanded a valid explanation and became the "playground of economists." Spatial analysis emerged from the study of location of industries to a more general pattern of all economic activities in space and time. Urban areas are interpreted as to facilitate production and exchange by proximity of location of producers and consumers. The proximity is interpreted as distance or accessibility, which the individual producer or consumer tries to optimize so as to maximize his utility. The urban agglomeration is reduced to a transportation network where transportation costs create a market pattern in spatial distribution of prices as well as in the allocation of suppliers to demanders and in the allocation of land to competing products. Space enters these models as a friction which can be overcome only by costs and thus is replaced by abstraction.

The city is reduced to a featureless plain, "on which all land is of equal quality ready for use without further improvements, and freely bought and sold." The second assumption is the introduction of the mentioned "homunculus economicus," that uninteresting individual economic man.

In spatial allocation models, in general, what may be classified as externalities, neighborhood effects, etc., are neglected. The conceptualized city is regarded as a well balanced system. Further, the approach to urban areas is based on the neoclassical tools of equilibrium analysis and neighborhood effects would be a disturbance of the smooth market allocation mechanism. The optimal allocation of resources via market mechanism is based on the fetishization of the iron law of supply and demand.

The market mechanism is ideologized so that demand and supply are regulated without any outer interferences. The prices guarantee the optimal allocation of the factors of production, for the spaceless economists in time, for the spatial economist in space and time. The thesis of the optimal allocation of resources via the market process is in general contestably in both sectors of economic science. The failure of the market mechanism is reduced to neighborhood effects and externalities existing
partially but not exclusively in space! 'Urban region ... is a casebook of market imperfection'\textsuperscript{103} on the other hand, it is argued the existence of urban regions can be reduced to these interdependencies of market imperfections.

In addition to the aforementioned importance of demand and supply in its spatial context, the 'iron' law is drawn for the formation of factor prices. Each factor revenue is determined by its marginal productivity. This theorem serves as legitimation for the equal distribution of income and diverts from the central question of capitalism, to whom these factors belong and how they are distributed within society.

Capital is a factor like all the rest and the distinction between work and property has disappeared from view ... and the apparent rationality of the system of distribution of the product among three factors of production conceals the arbitrary nature of the distribution of the factors between the chaps.'\textsuperscript{104} As we shall see later, this harmony between the factors of production is not an invention of the neoclassical school but can be traced to one of the location theorists.

4.0 Digression on Externalities

Under the term external effects -- external economy or external diseconomy -- often quite different terms are subsumed. Some authors prefer the term social cost or social benefits.\textsuperscript{105} Others describe the same with spillover or negative or positive divergencies between private and social net marginal product of production.\textsuperscript{106} Others try to differentiate between external benefits or costs and spillovers.\textsuperscript{107} Often different conceptions of external effects are connected with the same term.\textsuperscript{108}

Most of the analysis of externalities is devoted to the work of A. Marshall and Pigou.\textsuperscript{109} Marshall analyzes external effects not within the framework of a single firm, but in the framework of an industry. Only in this greater context can the category of external effects be developed. With Pigou this context becomes quite clear. The context of a macro-economic aggregate makes it possible to differentiate
between the private results of production and the social implications of micro-economic activity, hence, external effects are described as the divergence between private and social marginal net product. It seems obvious that the theory of external effects under economic development (with the growing social implication of private production and consumption) becomes more and more important. This means that the social consequences as well as the social prerequisites of private economy have to be regarded. External effects of private production might sum up and might have certain macro-economic or social effects or inconveniences and damages to others. An example may illustrate the negative effects of the agglomeration in water and air pollution, which on a certain level will effect the ecological balance and might create disadvantages for a human being in the entire agglomeration.

In general three different levels of external effects can be differentiated. The three levels are described as "limit of control, sensitivity and knowledge." The limit of control is described as the margin where a subject has control over external effects as the result of the production of another. He can act according to his 'utility function' and is able to internalize these effects if he so desired. This is the case in most vertically related firms within an industry.

External effects must be beyond a minimum limit of sensibility if they can be included in a utility function. The relevance of these effects may depend on several functions and factors determining whether a subject will internalize them or not. The limit of sensitivity is not congruent with the limit of control. An example may illustrate this. The user of public water facilities might wish to internalize certain advantages; they will be part of his production function but he has no power of control.

The limit of information is the margin where an individual has information of external effects but they are irrelevant for his production function. Two cases should be differentiated here: 1) A subject has knowledge, for example, of the positive effects on his production function if a freeway would be extended to his location.
If a speculator had such information he would withhold the land until the limit of sensitivity has been extended; 2) He might know who is polluting the river on which he is located, but he is using his own well or is taking water out of another river, so these external effects will be irrelevant and outside of his limit of sensitivity. We should add that the limits of sensitivity and information are highly dependent on information, institutional factors, social and individual structures, technological and economical conditions.

To solve external effects, economists have often proposed "to render external economies internal,"\(^{113}\) to make the person who makes the decision to bear all the consequences."\(^{114}\) Then we would find in a society with a homogeneity of interests or in a one sector economy no external effects or social costs. Consequently, it would appear that the best solution would be to socialize the private means of production and by definition no external effect would exist. If we would identify in society the type mentioned above external effects which easily can be gained - the socialistic countries are faced with the problem of air pollution as well as the capitalistic countries - the definition of external effects should be extended toward "divergencies between micro or macro-economic conditions of production and consumption"\(^{115}\) or we may determine that external effects are consequences of technical progress.\(^{116}\) However, such definitions are not satisfactory enough because they imply an identical economic system in both systems. Under capitalism externalities contribute to market failure while under socialism, they are the result of a planning failure.

Externalities are a "pervasive and important feature of urban areas. Some benefits or costs flowing from a particular action are borne by an economic decision unit independent of the unit pursuing the course of action."\(^{117}\) To separate these actions is a difficult task, urban systems are of such a complex nature, that is to say, the inter-relationship and external effects within these systems are so numerous and so many other factors are involved, that it is very difficult to identify in general all influences.
It follows that prices cannot be the measure for all products and cannot be the basis for rational calculation. To illustrate this, suppose a firm plans to settle in a city which has structural unemployment. By its action unemployment might decrease; the building activity would be enhanced, etc. But these positive or negative factors are not included in the location decision. Another example might be the competition between, let's say, a retail company and an insurance company. The higher rent bid curve of the insurance company is not necessarily an indicator of a better use or locational decision but might only be the result of a better economic development of the past. The steeper rent bid curves might later reflect social costs for the society as a whole, e.g. in kinds of higher peak hour congestion, which would not be the case in the retail store, etc. These facts forced economists to deal with external effects in the urban scene. Others have argued that this would go too far because "all actions have side effects." These side effects are from relative complexity and it might be impossible to comprehend or quantify all. This would have to include all inter-relationships among various economic, social, political and spatial phenomena.

The existence of externalities "creates the necessity or desirability of city and regional planning." But planned intervention in the urban scene usually is regarded as a means to enhance the market mechanism so that it can serve again as allocation device. Further, each planned intervention presupposes a knowledge about the theoretical investigation of the interdependencies which should be regulated.

What mainly is not regarded in the concept of externalities in a micro-centric analysis is the veiled social interdependence of private production with external interdependence. For Marx the contradiction between the social character of production and private appropriation of the result of production, based on private property of the means of production, is the central contradiction of capitalism. Marx elaborates this contradiction in the third volume of "das Kapital" where he discusses the "economy in employment of constant capital." He writes that the capitalistic production "loses for
society what it gains for the individual capitalist."\textsuperscript{120}

The social results of the individual utility maximization process are not congruent with the private results of the production process. This irrationality of the capitalistic production process, as the rationality in particular (of individual capital) and the irrationality on the general level, is described by the so-called radical economists as "the contradiction between private property and the increasingly social character of production and consumption."\textsuperscript{121} It is interesting, however, to recognize the similarities of the result of this knowledge in comparison with Marxian understanding. On the other hand, the Marxian analysis is called an extreme "bias" and "outdated."\textsuperscript{123} To focus on the results of capitalistic organization "such as alienation, perverse social relations in production and exploitation" reassures that the Marxian labor theory of value is a powerful tool to explain real world phenomena and is not "outdated and an extreme bias."\textsuperscript{124}

It is in general agreed that externalities in the urban scene are of conceptual importance but a reduction of externalities as a malfunctioning of the market system as the result of a Marshallian or Pigouvian construction will veil the central understanding. Externalities in capitalism are the result of the subsumption of a part of the social life under the domination of capital and bear the central contradiction of the capitalistic mode of production.
PART III Retrospective of v. Thünen's Work

1.0 Preliminary Remarks

So far we have developed some issues in location theory, spatial economy and positive economics. In this chapter we will concentrate on the origin of certain approaches to spatial analysis which fall under the broad rubric "land utilization theory." These theories focus mainly upon the competition between different producers for space on which to operate and upon the role of land rent as price for space and as sorter of the urban areas. The central question which can be addressed is the question of how specific parcels of land are used under given market prices of the products and transportation costs. These analyses are based on the concept of an equilibrium of the urban structure. In general these models rest on two factors - "the net price per unit received for his (of a producer) output and the price he has to pay (per acre) for the use of land." The realization of the net prices of outputs depends on the transportation cost to a single market center. Because perfect competition is assumed, for the individual producer the demand curve is horizontal, no producer can influence the price by supply. The nearness to the market center determines the kind of land use possible under its given technical production function and the transportability of the output. The resulting land use pattern results from balancing between the centrifugal and centripetal forces. Because nearness to the market center is valued higher than at a greater distance from it, competition results in 'rent bid curves,' which are determining the land use into a systematic series of concentric ring-shaped zones. Because there exists a maximum rent, an individual producer (consumer) can afford to pay at a certain location a different spatial pattern and thus a different spatial pattern emerges.

The origin of these assumptions for a general land use theory have their roots in the classical work of J. H. von Thünen. V. Thünen's spatial allocation model is
is regarded as the first accomplishment of location theory. We have to speak of a locational accomplishment so much the more because it is a spatial economic model. On the other hand, we might argue that especially in this construction of a spatial economic model, v. Thünen's economic knowledge is restricted because the object of knowledge, his model, confines a certain epistemological process.

V. Thünen's is one of these mysterious figures in the history of economic science, often quoted, but read less. Certain novelties in location theory and economic theory are attached to his analysis. For some he is the founder of location theory, for others the founder of mathematical economics. Similarly, the great Marshall quotes v. Thünen for his knowledge of the marginal increment, from where he borrows the term. Paul Samuelson in the recent debate of the capital controversy mentioned v. Thünen in relation to the existence of a factor price frontier; while Dempsey sees profit sharing as v. Thünen's fundamental contribution to economics. Wicksell notes Thünen's contribution to the productivity theory of capital and his contribution to rent. Thünen's concept of a natural wage is discussed with Schumpeter and Dempsey. It seems that economic theory starts with J. H. von Thünen.

The central topic in this part will be v. Thünen's equilibrium model and how the object of knowledge is already preformulated in such a manner that the result of knowledge is limited by the process of abstraction. Further, on top of this, a central philosophy in the form of a general moral order justifies the result and thirdly that from the very beginning the locational model is of lesser important than his 'spaceless' economic investigation.

2.0 The Man

V. Thünen was born on June 24, 1783. His family enjoyed a firm fuedal position in the grand duchy of Oldenburg. Until 1799 he visited school and went then to a two years apprenticeship in practical farming on an estate near Hooksiel. In February, 1802,
Thünen enrolled in the Agricultural College at Grob Flottbek, a suburb of Hamburg, and attended lectures at Celle, about 70 km south of Hamburg. Perhaps important for the development of his thoughts was the contact to Baron Caspar Vogt, a wholesale merchant engaged in research on his estate in Klein-Flottbek, who "once shared with his employees 50% of the profits of his foreign business to the amount of one million Reichsthaler." At this time in Grob Flottbek he wrote five papers of which one was entitled "Description of the Agriculture of Grob Flottbek" and in which the first ideas of his later work were formulated. "If one assumes that a large city lies in the center of a country 40 miles in diameter and that this country can sell its products in this city and that agriculture in this state stands at the highest condition of development, then one can assume that the agricultural system around the city will be divided into four types." In 1803 he started studying at the University of Gottingen, where he devoted himself to studies in natural science, chemistry, economics and political science - and also Kant's "Critique of Pure Reason." From 1806 to 1810 he rented an estate called RUBKOW belonging to his brother-in-law and finally in June 28, 1810, he bought the 1146 acre estate Tellow from his brother-in-law, located 37 miles southeast of Rostock (DDR). Here he laid the foundation for his later well known work in the year 1810-1815. From his individual bookkeeping he developed his model based upon an actual situation. His work published in 1826 under title "The Isolated State in its Relation to Agriculture and National Economy, Part I," was already finished in 1820. This first part is mainly regarded as his major contribution to location theory. Part I reappeared in 1842, revised but not substantially. Already before 1826, v. Thünen had turned his attention to the major topic - the study of wages. This work, already finished in 1830 with the discovery of the famous formula $a \times p$. This research was published in 1850 under the title "The Isolated State in Relation to Agriculture and Political Economy, Part II," "The Natural Wage and its Relation to the Rate of Interest and to Rent." Later parts of his work were published as fragments posthumously in 1863. The formula $a \times p$ was of such
importance for him that his gravestone bears this formula. In 1830 the University of Rostock granted him an honorary doctorate for the distinctive characteristics of his work. In the years of the bourgeois class struggle in Germany - 1848 - he introduced a profit sharing on his estate and was elected to the 'bourgeois Nationalversammlung' in Frankfurt but he was not able to take the seat.

3.0 The Ideal State

3.1 On Method

In his introduction to the second edition, he writes, "this method of analysis has illuminated and solved so many problems in my life and appears to me to be capable of such widespread application that I regard it as the most important matter contained in all my work." He is aware of the problem which is involved in his method of abstractions, "because they do not correspond to the condition of reality" and he hopes that the reader will not reject these assumptions as arbitrary and pointless. The method applied here is of the second type mentioned earlier.

Such a method embraced the danger that it may be pushed too far; however, with its limits it is perfectly valid. However, if the employed assumptions are treated as the essence of reality, not merely in its abstract and partial reflection, the result may be taken as the end goal, according to which reality has to be formed.

The assumption used by v. Thünen bears a striking resemblance to those of his later successors. "Imagine a very large town at the center of a fertile plain which is crossed by no navigable river or canal. Throughout the plain the soil is capable of cultivation and of the same fertility. Far from the town the plain turns into an uncultivated wilderness which cuts off all communication between this state and the outside world."

This plain is assumed to contain no other cities but the central town and in this all manufactured products must be produced. The city depends entirely on the surrounding country for its supply of agricultural products.
All mines and mineral deposits are assumed to be located right next to the central town and the question is asked, "how under these circumstances will agriculture be developed and how will the distance from the city affect agricultural methods when these are chosen in the optimal manner."  

His ultimate goal in his locational theory is to determine the highest net revenue which a given parcel of land can yield under certain 'given' conditions and 'variable' conditions. 'Given' are the commodity price at the market center, depending on the size of the market, as well as all input prices and the transportation rates to the market center. As variable in his model is the distance from the market center, the size of the farm, the output per acre or per farm, depending on the size and the input coefficient (labor and capital). Not only the method of abstraction from the real world but also the given conditions as well as the variables are analogous to those employed in Alonso's model, in particular his residential land use model.  

The given constants v. Thünen gains out of his empirical investigations from good bookkeeping for 10 years served as data outside of his model. Further, farmers occupying the area around the city are adjusting their land use to any economic conditions that might evolve; consequently, they are totally informed about market prices and no other factors are employed which may contribute to regional diversity and agricultural production.

To explain his model, in short, let's assume first only the distance variable. We may express this in the following equation, where R stands for net revenue or rent, Y for unit yield per acre, I for input per acre, including labor and all other expenditures, T for transportation rate and X for distance from the market center in miles and U for units of output and D for market price. For it is assumed that different products are produced in the isolated state, the index j may stand for different commodities produced. We set:

\[ R(x)_j = u p Y_j - I(x)_j - Tu(x)_j \]
This, however, is a rough simplification because \( j \) may represent a single commodity or a combined product of crop farming without fallow, crop farming with pasture and fallow, three field system and livestock farming. In chapter 6-26, he elaborates quite extensively on this to determine the optimal rotation of his fields. The graph below illustrates the emerging land use pattern.

Because different land uses are possible at any given distance from the market center, each farmer, in order to maximize his net revenue or rent will put the land into the "highest and best use." On the other hand, rent, here, acts as a sorter because the higher and best use can outbid the lower land use at a given distance from the market center, that is to say, which yields a lower net revenue at this location.

If the production expenses and yields are varied over distance from the market center, we gain, with the increasing distance lower production expenses with a resulting reduction in yields. Consequently, the intensity of cultivation is lowered up to the fringe where the wilderness begins, intensity as well rent are zero. By such a variation in the input, the land rent or net revenue may still be positive beyond the old 'zero-rent' location as we gain out of the following illustration:
These investigations in the variation in the inputs is the major inquiry in the second book where he formulates marginal products and develops his natural wage concept.

It is important to note that in the isolated state no transportation system or road system exists. Transportation is an ideal concept, either no transportation system or every estate is linked with the city by a radial transportation system. Transportation is viewed as the linkage between two points, producer and market by abstracting from the road. Abstractions, however, are necessary preconditions for scientific knowledge. V. Thünen obviously had been aware of the danger involved in the use of abstractions. He writes, "that mentally we separate what in reality is interdependent and that we base our findings on assumptions which, not being fully conscious of them, we fail to make explicit and that we then regard as generally valid what is valid under these assumptions! The history of political economy offers many striking illustrations of such pitfalls." "

3.2 On Land Rent

3.2.1 V. Thünen's Perspective

V. Thünen's theory of rent is based on the same assumption as the classical economists of his time, especially Ricardo. Differences in the marginal value product of different units of labor and capital, as the result of a different fertility of land or location and the effects of intensive cultivation, are due to the existence of a differentiated net product. Land rent, v. Thünen defines as, "that portion of the farm revenue that is left after deduction of the interest on the value of the buildings, timber, fences, and all other valuable objects separable from the land, that portion which pertains to the land itself," while estate rent (Gutsrente) he understands as combined out of the rent of land and the interest rate on the value of the buildings. Here he criticizes Adam Smith's definition of land rent, which fails to distinguish between ground rent and the interest rate on sunk capital. Obviously rent is not part
of the value of the product but is paid out of the surplus yield. Capital will not be
invested in an estate, e.g., at a zero rent if the prospective revenue on the invested
capital is not sufficient to yield just the return on other investments of same risk
at the current rate of interest. If on the other hand, on an existing estate, the revenue
falls or is reflected by a rise in the rate of interest on capital while the farm's
revenue remains unchanged, land rent would become negative, though cultivation may
continue up to the point where capital would be withdrawn; if buildings on the estate
were burned down, production would not be continued.\textsuperscript{152} Land rent thus determines the
continuation of arming at the margin.

The first form of rent arises out of the differential fertility of the ground or
the locational advantage of one producer over the other. The decision whether a con-
centric ring should be put into use depends entirely on the market price. Thus, if
the market price of an agricultural product has increased enough, the next ring can be
taken under cultivation. Since land is assumed to be of uniform fertility, there exists
no developmental process from fertile to less fertile land. The town's demand can only
be met at a price which "at least compensates for his (the farmer's) outlay in producing
the grain and bringing it to the market, the most distant producer whose grain is still
required" and "the price must be just so high that on the farm which incurs the highest
cost in producing grain and taking it to the market (but the product of which is still
required to meet the demand) the land rent does not sink below zero."\textsuperscript{153} The production
cost of the marginal land will determine the market price.

The second form of rent v. Thünen realizes in the phenomenon of diminishing returns
is the result of an increasing intensification of cultivation over a fixed acreage. The
successive addition of labor to capital adds a smaller and smaller increment to the
total product. The margin is reached when the value of the last employed worker equals
the increment of production he produces minus the interest rate of capital. Thus,
the wages of all workers are determined and in addition there remains a surplus product
over the wages paid, which forms the second form of rent. This form of rent arises independently of distance and fertility with the only condition that land is under cultivation.\textsuperscript{154} This effect is described by v. Thünen with the assumption of smaller towns of uniform size and in three miles distance from each other\textsuperscript{155} while the price of products as well as the soil of the plain is of uniform fertility. The advantage of one's situation over another has become so negligible that it is regarded as virtually zero.\textsuperscript{156} By the distribution of the population into smaller centers, he assumes that wages fall and this is associated with a more intensive use of land. Consequently, the product price is increased until the last "man hired just manages to cover the wage he is paid"\textsuperscript{157} and the wage for that last man has decreased enabling the farmer to obtain a "surplus which forms the second source of rent."\textsuperscript{158}

The third source of rent is the result of soil improvement as a consequence of the fall of wages. These soil improvements are indestructably bound to and become part of the land,\textsuperscript{159} "like the construction of sewage farms and so on. Interest and profits are no longer distinguishable in the long run and both become part of the land rent, of which they form the third constituent."\textsuperscript{160}

Further, I guess it is important to note certain interdependencies which v. Thünen realizes. At a certain location a farmer will realize a situation rent. If, however, the wages expressed in rye fall (real wage remains constant), this enables the farmer to use a more intensive cultivation and consequently earn a higher surplus.\textsuperscript{161} A second effort which reflects rent is the change in the size of a central town or a new town. He writes "every new town and every new factory raises the return to capital and wages as well as land rent. As a result, capital and labor increase so rapidly that within a short period return of capital and wages will have reverted to this former level. The rise in land rent on the other hand is lasting because land is fixed in amount and can't be increased."\textsuperscript{162}
3.2.2 Land Rent From a Marxian View

A careful reader of the 'Isolated State' may find that v. Thünen's theory is 'somewhat' based on a labor theory of value. He writes in the post-humously published edition "capital in itself is a dead thing and becomes productive only through the labor of men and capital itself is only the product of human labor" but the worker has "become the slave of capital" and has gone "from the state of freedom to that of need." The worker receives the value of his labor power through his marginal wage which is determined by the employment of the last worker. Consequently, v. Thünen assumes no deviation of values of the product and price of the commodities produced.

We will focus here on certain forms of rent which by the construction of an equilibrium model and the identity of values and prices can't be investigated. The object of knowledge is limited by these assumptions. The second form of critique had been especially stressed by Marx of Ricardo and opened Marx's discussion of an absolute ground rent. V. Thünen's rent theory is similar to that of K. Marx and can be subsumed under the form of differential rent I and differential rent II.

Differential rent always is a surplus profit and as such nothing more than a difference between the individual and the average societal production price. Such deviations between the individual and societal production price are normally to be found in the capitalistic production process; they are normal. These deviations via competition are the driving force of the equalization of the societal production price of a lower level. However, under certain conditions, e.g., the use of a natural force (power), this equalization can be hindered. The existence of a surplus profit and its conversion into rent is a prime condition in agriculture. This is the reason why Marx uses agricultural production for exemplifying his concept of rent. However, the existence of rent is not bound necessarily to this specific mode of production.

"Surplus profit, if normal and not due to accidental occurrences in the circulation process, is always produced as a difference between the products of two equal quantities of capital and labor and this surplus profit is transformed into ground rent when two equal quantities of capital and labor are employed on equal areas of land with unequal results."
The different results are based on two reasons, the one is the fertility of the ground, the other is the situation of the ground. Between both there exists an inter-dependency pulling in opposite directions. Ground may be of good fertility and a bad location or vice versa. Consequently, there is no reason why the development of the differential rent depends on the process of cultivation of ground of minor fertility, as Ricardo assumed.

Differential rent occurs because the same product on land of better fertility or better location is produced with less costs and sold at market prices, which are determined by the production price under the most unfavorable conditions but necessary to fulfill the demand for this product. The production price of zero rent land is always the regulating market price. However, the zero rent land is not a necessary condition. It is only necessary that the product produced under the most unfavorable conditions is determining the market price.

The second form of rent (differential rent II) for Marx arises out of the different productivity of capital on the same parcel of ground. While the first form of rent was based on the intensive expansion of land use, differential rent II is based on an intensive expansion of land use. According to their substance, both forms of rent are equal. However, the second form presupposes the first one. The differential rent is the basis and starting point in the historical development as well as at each point in time. Without these distinctions in fertility or situation, the possibility of rent would disappear in general. The cultivation of ground of different fertility or situation opens the possibility of additional capital for distinctive profits and surplus profits. The magnitude of the surplus profit here depends also on the magnitude of invested capital. This is the reason, if the land is cultivated by a tenant, he should have enough capital above a certain minimum for intensive cultivation. Further "this circumstance enables the actual capitalist tenants to appropriate a portion of surplus profit."

---

167

168
So far the differences between Marx's concept of rent and v. Thünen's concept are similar. But especially the zero rent concept draws certain attention. The existence of a different productivity of land or the laws of differential rent is independent of the existence of private property. However, the transformation of surplus profit into rent presupposes the existence of private property. Marx writes, "But differential rent presupposes the existence of a monopoly in landownership, landed property as a limitation to capital, for without it, surplus profit would not be transformed into ground rent nor fall to the share of the landlord instead of the farmer. And landed property as a limitation continues to exist even when rent in the form of differential rent disappears, e.g. on soil," of the least fertility. Because v. Thünen assumes in the beginning ground of uniform fertility that the question of private property may be applied on the fringe of his isolated state. What is done by this can be summarized by the following. The transformation of surplus profit into rent presupposes the existence of landed property. On the other hand, with the explanation of rent based on the zero rent concept, it is abstracted from landed property. All explanations which justify the cultivation of the zero rent land are based "on a de facto abolition of landed property, "an abolition" that only can take place under very specific circumstances which are by their very nature accidental." But random circumstances are not the main object of science. The reason that marginal land must 'yield' a rent opens the questions of whether rent enters like an 'indirect tax' into the price of the product which determines the market price that this increment appears "as an element that is independent of the value of the commodity." If we assume that marginal land yields a rent, there cannot exist any identity between the value of the commodity produced on land and the production price (cost price plus average profit). Under this condition capital does not realize its individual surplus value but surplus value in relation to the societal profit rate. According to the deviation of values from production prices, Marx groups commodities into three classes which can be
illustrated with the following example. C stands for capital (c for individual) V for variable capital, and S for surplus value. Further, it is assumed that the rate of exploitation S/V equals 100% and the organic composition C/c + v and the profit rate p' = \frac{S}{C + V}

<table>
<thead>
<tr>
<th>Org. Composition</th>
<th>Value</th>
<th>Profit Rate</th>
<th>Total Price</th>
<th>Value ≤ Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 90c + 10V + 10S</td>
<td>0.9</td>
<td>110</td>
<td>120</td>
<td>V &lt; Pr.</td>
</tr>
<tr>
<td>2. 80c + 20v + 20s</td>
<td>0.8</td>
<td>120</td>
<td>120</td>
<td>V = Pr.</td>
</tr>
<tr>
<td>3. 70c + 30v + 30s</td>
<td>0.7</td>
<td>130</td>
<td>120</td>
<td>V &gt; Pr.</td>
</tr>
</tbody>
</table>

| 240c + 60V + 60s | 0.8 | 120 | 20% | 120 |

The commodity Marx searched for should have the following properties. The price at which a commodity is sold should include more surplus value than the average profit determined by the societal profit rate. Consequently, the commodity yielding a ground rent is differentiated from the aforementioned possibilities. However, obviously immanent surplus value can only be realized under the conditions of the third case. Such an assumption would violate the capitalistic law of competition for it presupposes that the products of land are excluded from the general law of value and capitalistic production.

The realization of immanent value is only possible for a class of commodities of under average organic composition and this includes the precondition that in this specific sphere of production certain circumstances exist necessary to realize the immanent surplus value. Or, that "in the process of equalization of commodities at average prices, this particular commodity does not have to pass on to other commodities so much of its intrinsic surplus value that it only yields the average profit but is able to realize a portion of its own surplus value which forms an excess over and above average profit so that it is possible for a farmer, who invests capital in this sphere of production, to sell the commodity at prices which yield him the ordinary profit and
at the same time enable him to pay the excess in surplus value realized over and above this profit to a third person, the landlord."

The existence of a surplus of the individual value of a commodity above the production price (cost price + average profit) is not enough to explain the existence of rent because such a deviation between value and price is to be found in a certain number of commodities, not only as a result of agricultural production. The realization of this immanent surplus value is only possible if capital comes upon an alien "force which it can but partially, or not at all, overcome and which limits its investment in certain spheres, admitting it only under conditions which wholly or partly exclude that general equalization of surplus value to an average profit." 

This alien force is the private property of certain individuals upon land, which appear as a barrier for the capital investment on marginal land. In the aforementioned case, landed property itself is the source of rent and has the power "to withdraw land from exploitation until economic conditions permit him to utilize it in such a manner as to yield him a surplus." It is not the increase in price of the product which creates the rent, but rent is the reason for its increase. However, certain limits are set for the existence of an absolute ground rent. The first one is the necessity that the organic composition of capital of this specific sector of production (here agriculture) is below the average.

Secondly, the extremes of absolute ground rent are set by the deviation of the individual value and the production price. The heights of the surplus between the price of the product of land above the production price are thirdly determined by the general market conditions, how far the market price will be equalized to the value of the product. But in any case, "the agricultural products will always be sold at a monopoly price, not because their price exceeds their value, but because it equals their value, or because their price is lower than their value but higher than their price of production. Their monopoly would consist in the fact that, unlike other products of
industry whose value is higher than the general price of production, they are not leveled out to the price of production."177

These two forms of rent (differential rent I + II and absolute ground rent) Marx regarded as the only normal forms of ground rent. Differential rent arises out of the difference between individual value of the product and market price, absolute ground rent out of the difference between individual value and production price.178

The absolute rent reduces the average profit rate because it extracts 'surplus value' which is excluded from the equalization of the profit rate. This is an extraction of surplus value or a transfer of surplus value from the class of capitalists to the classes of property owners, which appropriate surplus value from the worker.

Besides these two 'normal' forms of rent, which Marx also called, if combined, "actual rent,"179 rent only can be based on an actual monopoly price and totally independent of the value of the product, like an indirect tax. But these additions to the production price extract surplus value out of other spheres with the same influence on the general profit rate. But these kinds of rent, based on actual monopoly price, neither limited by the value of the commodities nor production price, is determined by competition of the landlords among one another and "by the buyer's needs and ability to pay."180 The actual monopoly price for Marx is a price which may deviate arbitrarily from the production price and individual value. He mentioned a vintage, which produces an extraordinary quality of wine, that can produce this quality only in a certain quantity. In this case, the monopoly price creates rent. "It must be distinguished whether the rent springs from a monopoly price, because a monopoly price of the product or the land exists independently of it, or whether the products are sold at a monopoly price because a rent exists."181 - the case for the existence of an absolute ground rent.

Three forms of rent today are generally accepted, while the form of an absolute ground rent only can arise under the assumption of a difference in the organic composition of capital. Because the neo-classical school fails to realize this deviation,182 absolute ground rent, where landed property is the cause of rent, is excluded as an object of knowledge. For Marx, the question of the real existence of an absolute
ground rent had been a matter of empirical investigation. What he wanted to show was at least the possibility of the theoretical existence of such a form of rent.¹⁸³

Absolute ground rent appears as a barrier to the profitable use of capital and brings up the contradiction between landed property and capital. On one hand, the capitalists tried to negate private property. On the other hand, "he lacks the courage since an attack on one form of property - a form of private ownership of a condition of labor - might cast considerable doubts on the form. " Besides, the bourgeois has himself become an owner of land."¹⁸⁴

In a spatial equilibrium model of a V. Thünen type, the object of knowledge is restricted to those relations on which the model is based. Further, it might be argued that v. Thünen as a feudal landlord would never dig the pit in which he might fall himself.

3.3 On Taxation

In quite another respect, the work of v. Thünen draws certain attention. In the progress of his study, he transforms his highly abstract model more and more to reality. Part III of Volume I deals with the impact of taxation on land use decision. Described are different forms of taxation which he summarized as: 1. a tax on the size of the enterprise - 2. a tax on consumption - 3. taxes on trades and industries - 4. taxation of land rent.

His method here is a comparison between the effects in his abstract model and the real world phenomena. The result of the first tax is that net revenue would be diminished. These would in the isolated state result in a non-cultivation of marginal land and he anticipates a decline in wealth and population. In the real world, this phenomenon is not to be seen in the pure condition, however, "it slows down but does not arrest the growth of the national property."¹⁸⁶ This, however, only holds if the tax reduces the consumption of grain. Such a tax (indirect as mentioned above) would raise the
price of grain, which depends not only on the production cost (outlays/transportation cost + tax) but also the ability to pay the price. This will cause poverty because the disposable income will be reduced by the amount of the tax and will be distributed among the same number of people. The result will be "those who become redundant and can no longer be fed and who will not automatically leave the country and a 'cut-throat struggle' for survival will determine who is to emigrate." The new steady state comes up either by out migration or a reduction in marriages. If this is the case, the "people's character" (Volkscharacter) has not changed towards consumption habits and the people's character is the foundation of the wage rate. Under these conditions, everybody "will not have less after payment of the tax than formerly."

Similar effects result from a tax on industries and trade. In an agrarian analogy, he states, "No part of the human body can suffer without damage to the whole, and similarly, no sector of industry or agriculture in the isolated state can be burdened with a tax without affecting every other occupation." In the real world, a tax on a certain industry may not heavily affect the absolute wealth, "but, nevertheless, the tax disrupts the harmonious ordering of the whole." The whole v. Thünen expands on the interrelation of different states.

An indirect tax levied on luxuries or nonessentials will cause no diminution of the people's expenditure on necessities. Their effects cause no more damage than a poll tax. The last one, if newly introduced, would increase the price for wage labor and result in a negative rent on marginal land and would lead to out migration.

The only tax for v. Thünen which makes no appreciable difference to the national wealth is the taxation of land rent. "Land rent does not spring from capital or labor but from the fortuitous advantage one farm enjoys over the other in the quality of its soil or its location. It may, therefore, be taken away without affecting in any way the use of capital or labor." But in the isolated state, land is cultivated by an 'homunculus economicus,' that uninteresting rational man who cultivates his land all
over the state with the same rationality. In the real world, because land rent is not a fixed number and is hard to estimate, land rent for the purpose of taxation (special experts would be required) may prevent the agricultural capitalist from improvements in the sunk capital, it may be "in fact, highly detrimental to a nation's welfare." It is interesting that he takes the same view as Henry George eighty years later. But as landed gentry, he only regards it as applicable to his ideal state.

So far we reviewed only the first part of v. Thünen's theory, often quoted by location theorists. In addition to his agricultural location theory, we may add that he envisages urban land use theory, based on the same principle and summarized under the variables of labor economics, greater convenience of a central location in the time saving made in trade and business and "for one and the same laws governing ground as well as land rent." V. Thünen was always aware of the striking differences between his ideal state and reality. "It would in fact be a marvelous accident if in reality, where everything is in the process of change, every change would be only a transition to something else and if the most reasonable relations in their final incompleteness would be already realized." The final completeness is the pure relation of his isolated state, according to which reality should be directed, the old so-called 'appriori method.' The phenomenology of reality is only a transition period "to a far away goal not yet attained." The situation in the isolated state is regarded as the final goal, as the means to an end. The spatial organization of society, his spatial organization model, only serves as an explanation of how men could live in harmony and his central topic becomes the question of a natural wage concept which could be realized if reality would be formed according to his providence. The inversion of reality and abstraction and the notions of form and content become here of central importance. It is, therefore, of interest to see where he starts the discovery of his famous formula \(-\sqrt{a \times p}\) and questions his natural society. Marx analyzed the real society subsumed under the
domination of capital. V. Thünen goes beyond capitalism to envisage utopia in the form of a harmonic society.

3.4 Bourgeois Society as the Final End of History

The central question of von Thünen's life work he summarized as: "is the meager wage that the common laborer gets almost everywhere a natural one or is it caused by exploitation which the laborer can't avoid?"\textsuperscript{196} The investigation of this question is not only important in the interest of economic science but also for the higher morality of society. Capital and landed gentry are exploiting labor power and are appropriating the product of labor. This opens the second question v. Thünen summarizes as "what is the law by which the product of labor is distributed among the workers, the capitalist and the landowner in a natural way."\textsuperscript{197} He certainly cannot accept the view that the natural wage is determined by the necessary means of subsistence or by demand and supply.

What is implicit in his work and what should be demonstrated here is the hypothesis that for v. Thünen the bourgeois society is the ultimate stage in the development of man, and he envisages a society dominated by the harmonic subsumption of man under capital and capital is only the substitution for the Hegelian world spirit and the world spirit for him is finally God\textsuperscript{198} (capital = God). The ideal state serves as an ideal construction for the demonstration of the final idea of the world spirit. Our "progressive bourgeois" subsumes under world history only the slow realization of a great idea, the world spirit. History is not comprehended on the materialistic basis and thus he tries to explain praxis out of ideas.

The transformation of history is certainly not the realization of a great idea "a mere act on the part of the self-consciousness, the world spirit or any other metaphysical specter but quite material and an empirically verifiable act,"\textsuperscript{199} based on the contradiction within the relation of production as the basis of all history.
V. Thünen's views of history bear a striking resemblance to the ruling ideologists of his epoch - especially Feuerbach. Like Feuerbach, he perceives workers "as a crowd of scrofulous, over-worked and consumptive starvelings and takes refuge "in the higher perception and in the ideal compensation of the species." As far as v. Thünen is a materialist, "he does not deal with history and as far as he conceives history, he is not a materialist." The source of all evil lies in the separation of the worker from his product and this destroyed "the fine patriarchal bond between master and those in their charge" and might bring up the 'idea' of communism. Such an idea, proclaiming "distribution of property and equality of income" may take root in the mind of the people and will destroy all bonds of harmony. "It certainly is not in the plan of the world spirit or providence that all progress in the development of humanity must be realized only after numerous setbacks and be brought about by much blood and misery of many generations. In the perception of truth and right and in such control of egoism that the privileged give up what they unjustly own lies the means to get humanity peaceful and happily to further development and higher goals." Translated into real language, this means for v. Thünen that the perpetuation of the civic society, which under the constant pressure of its own contradiction, might be resolved. Thus nobody can be astonished that he openly admitted the ideological and idealistic role of science. "It is the high task of science, not by any means of experience or the course of history, but by reason itself to discover and make known the truth and the goal for which we must strive in order to go forward and to gain our knowledge." The goal is justice and fairness or harmony; the system under which this should be realized is obviously a 'moral capitalism,' a system today we would call social welfare state as the eternal idea of mankind. Science here should discover and spread these abstract ideas. Fortunately, history never followed abstract ideas and ideologists but transformed the societal process of life through its internal contradictions. However, we must admit that such theories of harmony (the great society, the social welfare state, social market society) have become powerful tools to veil societal
contradictions but not to solve them. Our progressive bourgeois certainly doesn't wish to be called a revolutionary but tries to resolve the aforementioned problems "by going deeper into science, which makes clear the laws and which springs from human nature where we find answers to these questions."\textsuperscript{206}

It is admitted that the working class lives in poverty brought about by the fast breeding of this class. This constantly accounts for the excess supply of workers and decreases wages to the point of mere subsistence.

While the higher classes "sacrifice happiness of a marriage"\textsuperscript{207} for a time until their income has reached a level to maintain a family, the working class marries as soon as they can get lodging and is no older than 20 years. The overpopulation has its reason in the sexual needs and not in the needs of the individual and his children's sensual wants. Only if this need can be inverted and the necessity of the sensual needs gain priority will they use any money saved on the education of their children. Whether this may come about by state intervention or a saving of the worker, it would result, in any case, in a crash of the barriers "between the two classes of society"\textsuperscript{208} - the capitalists and the workers. Further, the increasing development of the productive force by intervention of knowledge may lead to a paradise "where the human being lives his life not in idleness but in moderate activity which exercises mind and body and brings health and happiness"\textsuperscript{209} without the division of property, destruction of cities and the murder of the rich, which according to his view are the demands of the communists and egalitarians. Because he fears the consequences of these ideas, the task of science is, before these ideas might be distributed among the working class, to prevent the spreading of these 'ridiculous goals' and set a higher moral order and this cannot be realized if factories shut down and wages rise. "Do not higher wages bring an end to the cultivation of whole areas of the less fertile soil? As these areas lie untilled, will not the fate of labor then be worse than it is now?"\textsuperscript{210}
3.5 The Natural Wage

The main part of v. Thünen's inquiry is to develop a satisfactory explanation of interest rates and the wage rate. This topic occupies his second part. Here it is abstracting from the land owner. All his theory is developed on marginal land as we will see. In the posthumus papers, his interest focuses on the distribution of the product of labor between the three production agents: capital, labor and land. Our interest here will focus on his derivation of the interest rate and wage rate, however, only in relation to his spatial allocation models in which way it serves here as an object of knowledge. We will abstract from his first approach to the problem of wages and capital which may be summarized under the condition of original accumulation.

In short, here he assumes a body of free independent individuals living under 'Robinson'-like conditions and devoting their effort to capital production. Land is of such fertility that it produces more than the original reproduction needed. After several years an individual in this free 'community' can devote his effort for one year to 'capital production' (nets, bows, and other tools). The use of this capital will produce a higher annual net return after the deduction of all expenditures per time than the original surplus. If he devotes his effort to the production of 'capital' this newly created capital may be lent to other individuals and an individual will demand a payment on the capital. The interest rate of the leased capital is calculated by the division of the yearly net product by the wage of one year's labor. If everybody in the community has been supplied with capital, a new and different capital production will arise. But this newly produced capital yields not the same return, it results in a smaller increment in revenues. The rent is determined by the division of the net revenue from the last increment divided by the wage rate. Consequently, interest falls with the increase in capital units and wages rise. Higher wages will increase the cost of capital production because it is a body of free individuals who will produce just that amount of capital which will maximize the revenue obtainable from the investment of one year's surplus.
industry whose value is higher than the general price of production, they are not leveled out to the price of production."\textsuperscript{177}

These two forms of rent (differential rent I + II and absolute ground rent) Marx regarded as the only normal forms of ground rent. Differential rent arises out of the difference between individual value of the product and market price, absolute ground rent out of the difference between individual value and production price.\textsuperscript{178}

The absolute rent reduces the average profit rate because it extracts 'surplus value' which is excluded from the equalization of the profit rate. This is an extraction of surplus value or a transfer of surplus value from the class of capitalists to the classes of property owners, which appropriate surplus value from the worker.

Besides these two 'normal' forms of rent, which Marx also called, if combined, "actual rent,"\textsuperscript{179} rent only can be based on an actual monopoly price and totally independent of the value of the product, like an indirect tax. But these additions to the production price extract surplus value out of other spheres with the same influence on the general profit rate. But these kinds of rent, based on actual monopoly price, neither limited by the value of the commodities nor production price, is determined by competition of the landlords among one another and "by the buyer's needs and ability to pay."\textsuperscript{180} The actual monopoly price for Marx is a price which may deviate arbitrarily from the production price and individual value. He mentioned a vintage, which produces an extraordinary quality of wine, that can produce this quality only in a certain quantity. In this case, the monopoly price creates rent. "It must be distinguished whether the rent springs from a monopoly price, because a monopoly price of the product or the land exists independently of it, or whether the products are sold at a monopoly price because a rent exists"\textsuperscript{181} - the case for the existence of an absolute ground rent.

Three forms of rent today are generally accepted, while the form of an absolute ground rent only can arise under the assumption of a difference in the organic composition of capital. Because the neo-classical school fails to realize this deviation,\textsuperscript{182} absolute ground rent, where landed property is the cause of rent, is excluded as an object of knowledge. For Marx, the question of the real existence of an absolute
ground rent had been a matter of empirical investigation. What he wanted to show was at least the possibility of the theoretical existence of such a form of rent.183

Absolute ground rent appears as a barrier to the profitable use of capital and brings up the contradiction between landed property and capital. On one hand, the capitalists tried to negate private property. On the other hand, "he lacks the courage since an attack on one form of property - a form of private ownership of a condition of labor - might cast considerable doubts on the form. Besides, the bourgeois has himself become an owner of land."184

In a spatial equilibrium model of a V. Thünen type, the object of knowledge is restricted to those relations on which the model is based. Further, it might be argued that v. Thünen as a feudal landlord would never dig the pit in which he might fall himself.

3.3 On Taxation

In quite another respect, the work of v. Thünen draws certain attention. In the progress of his study, he transforms his highly abstract model more and more to reality. Part III of Volume I deals with the impact of taxation on land use decision. Described are different forms of taxation which he summarized as: 1. a tax on the size of the enterprise - 2. a tax on consumption - 3. taxes on trades and industries - 4. taxation of land rent.

His method here is a comparison between the effects in his abstract model and the real world phenomena. The result of the first tax is that net revenue would be diminished. These would in the isolated state result in a non-cultivation of marginal land and he anticipates a decline in wealth and population. In the real world, this phenomenon is not to be seen in the pure condition, however, "it slows down but does not arrest the growth of the national property."186 This, however, only holds if the tax reduces the consumption of grain. Such a tax (indirect as mentioned above) would raise the
price of grain, which depends not only on the production cost (outlays/transportation cost + tax) but also the ability to pay the price. This will cause poverty because the disposable income will be reduced by the amount of the tax and will be distributed among the same number of people. The result will be "those who become redundant and can no longer be fed and who will not automatically leave the country and a 'cut-throat struggle' for survival will determine who is to emigrate." The new steady state comes up either by out migration or a reduction in marriages. If this is the case, the "people's character" (Volkscharacter) has not changed towards consumption habits and the people's character is the foundation of the wage rate. Under these conditions, everybody "will not have less after payment of the tax than formerly." Similar effects result from a tax on industries and trade. In an agrarian analogy, he states, "No part of the human body can suffer without damage to the whole, and similarly, no sector of industry or agriculture in the isolated state can be burdened with a tax without affecting every other occupation." In the real world, a tax on a certain industry may not heavily affect the absolute wealth, "but, nevertheless, the tax disrupts the harmonious ordering of the whole." The whole v. Thünen expands on the interrelation of different states.

An indirect tax levied on luxuries or nonessentials will cause no diminution of the people's expenditure on necessities. Their effects cause no more damage than a poll tax. The last one, if newly introduced, would increase the price for wage labor and result in a negative rent on marginal land and would lead to out migration.

The only tax for v. Thünen which makes no appreciable difference to the national wealth is the taxation of land rent. "Land rent does not spring from capital or labor but from the fortuitous advantage one farm enjoys over the other in the quality of its soil or its location. It may, therefore, be taken away without affecting in any way the use of capital or labor." But in the isolated state, land is cultivated by an 'homunculus economicus,' that uninteresting rational man who cultivates his land all
over the state with the same rationality. In the real world, because land rent is not a fixed number and is hard to estimate, land rent for the purpose of taxation (special experts would be required) may prevent the agricultural capitalist from improvements in the sunk capital, it may be "in fact, highly detrimental to a nation's welfare." It is interesting that he takes the same view as Henry George eighty years later. But as landed gentry, he only regards it as applicable to his ideal state.

So far we reviewed only the first part of v. Thünen's theory, often quoted by location theorists. In addition to his agricultural location theory, we may add that he envisages urban land use theory, based on the same principle and summarized under the variables of labor economics, greater convenience of a central location in the time saving made in trade and business and "for one and the same laws governing ground as well as land rent." V. Thünen was always aware of the striking differences between his ideal state and reality. "It would in fact be a marvelous accident if in reality, where everything is in the process of change, every change would be only a transition to something else and if the most reasonable relations in their final incompleteness would be already realized." The final completeness is the pure relation of his isolated state, according to which reality should be directed, the old so-called 'appriori method.' The phenomenology of reality is only a transition period "to a far away goal not yet attained." The situation in the isolated state is regarded as the final goal, as the means to an end. The spatial organization of society, his spatial organization model, only serves as an explanation of how men could live in harmony and his central topic becomes the question of a natural wage concept which could be realized if reality would be formed according to his providence. The inversion of reality and abstraction and the notions of form and content become here of central importance. It is, therefore, of interest to see where he starts the discovery of his famous formula \(-\sqrt{a \cdot x \cdot p}\) and questions his natural society. Marx analyzed the real society subsumed under the
domination of capital. V. Thünen goes beyond capitalism to envisage utopia in the form of a harmonic society.

3.4 Bourgeois Society as the Final End of History

The central question of von Thünen's life work he summarized as: "is the meager wage that the common laborer gets almost everywhere a natural one or is it caused by exploitation which the laborer can't avoid?" The investigation of this question is not only important in the interest of economic science but also for the higher morality of society. Capital and landed gentry are exploiting labor power and are appropriating the product of labor. This opens the second question v. Thünen summarizes as "what is the law by which the product of labor is distributed among the workers, the capitalist and the landowner in a natural way." He certainly cannot accept the view that the natural wage is determined by the necessary means of subsistence or by demand and supply.

What is implicit in his work and what should be demonstrated here is the hypothesis that for v. Thünen the bourgeois society is the ultimate stage in the development of man, and he envisages a society dominated by the harmonic subsumption of man under capital and capital is only the substitution for the Hegelian world spirit and the world spirit for him is finally God (capital = God). The ideal state serves as an ideal construction for the demonstration of the final idea of the world spirit. Our "progressive bourgeois" subsumes under world history only the slow realization of a great idea, the world spirit. History is not comprehended on the materialistic basis and thus he tries to explain praxis out of ideas.

The transformation of history is certainly not the realization of a great idea "a mere act on the part of the self-consciousness, the world spirit or any other metaphysical specter but quite material and an empirically verifiable act," based on the contradiction within the relation of production as the basis of all history.
V. Thümen's views of history bear a striking resemblance to the ruling ideologists of his epoch - especially Feuerbach. Like Feuerbach, he perceives workers "as a crowd of scrofulous, over-worked and consumptive starvelings and takes refuge "in the higher perception and in the ideal compensation of the species." As far as v. Thünen is a materialist, "he does not deal with history and as far as he conceives history, he is not a materialist." The source of all evil lies in the separation of the worker from his product and this destroyed "the fine patriarchal bond between master and those in their charge" and might bring up the 'idea' of communism. Such an idea, proclaiming "distribution of property and equality of income" may take root in the mind of the people and will destroy all bonds of harmony. "It certainly is not in the plan of the world spirit or providence that all progress in the development of humanity must be realized only after numerous setbacks and be brought about by much blood and misery of many generations. In the perception of truth and right and in such control of egoism that the privileged give up what they unjustly own lies the means to get humanity peaceful and happily to further development and higher goals." Translated into real language, this means for v. Thünen that the perpetuation of the civic society, which under the constant pressure of its own contradiction, might be resolved. Thus nobody can be astonished that he openly admitted the ideological and idealistic role of science. "It is the high task of science, not by any means of experience or the course of history, but by reason itself to discover and make known the truth and the goal for which we must strive in order to go forward and to gain our knowledge." The goal is justice and fairness or harmony; the system under which this should be realized is obviously a 'moral capitalism,' a system today we would call social welfare state as the eternal idea of mankind. Science here should discover and spread these abstract ideas. Fortunately, history never followed abstract ideas and ideologists but transformed the societal process of life through its internal contradictions. However, we must admit that such theories of harmony (the great society, the social welfare state, social market society) have become powerful tools to veil societal
contradictions but not to solve them. Our progressive bourgeois certainly doesn't wish to be called a revolutionary but tries to resolve the aforementioned problems "by going deeper into science, which makes clear the laws and which springs from human nature where we find answers to these questions."\textsuperscript{206}

It is admitted that the working class lives in poverty brought about by the fast breeding of this class. This constantly accounts for the excess supply of workers and decreases wages to the point of mere subsistence.

While the higher classes "sacrifice happiness of a marriage"\textsuperscript{207} for a time until their income has reached a level to maintain a family, the working class marries as soon as they can get lodging and is no older than 20 years. The overpopulation has its reason in the sexual needs and not in the needs of the individual and his children's sensual wants. Only if this need can be inverted and the necessity of the sensual needs gain priority will they use any money saved on the education of their children.

Whether this may come about by state intervention or a saving of the worker, it would result, in any case, in a crash of the barriers "between the two classes of society"\textsuperscript{208} - the capitalists and the workers. Further, the increasing development of the productive force by intervention of knowledge may lead to a paradise "where the human being lives his life not in idleness but in moderate activity which exercises mind and body and brings health and happiness"\textsuperscript{209} without the division of property, destruction of cities and the murder of the rich, which according to his view are the demands of the communists and egalitarians. Because he fears the consequences of these ideas, the task of science is, before these ideas might be distributed among the working class, to prevent the spreading of these 'ridiculous goals' and set a higher moral order and this cannot be realized if factories shut down and wages rise. "Do not higher wages bring an end to the cultivation of whole areas of the less fertile soil? As these areas lie untilled, will not the fate of labor then be worse than it is now?"\textsuperscript{210}
3.5 The Natural Wage

The main part of v. Thünen's inquiry is to develop a satisfactory explanation of interest rates and the wage rate. This topic occupies his second part. Here it is abstracting from the land owner. All his theory is developed on marginal land as we will see. In the posthumous papers, his interest focuses on the distribution of the product of labor between the three production agents: capital, labor and land. Our interest here will focus on his derivation of the interest rate and wage rate, however, only in relation to his spatial allocation models in which way it serves here as an object of knowledge. We will abstract from his first approach to the problem of wages and capital which may be summarized under the condition of original accumulation.

In short, here he assumes a body of free independent individuals living under 'Robinson'-like conditions and devoting their effort to capital production. Land is of such fertility that it produces more than the original reproduction needed. After several years an individual in this free 'community' can devote his effort for one year to 'capital production' (nets, bows, and other tools). The use of this capital will produce a higher annual net return after the deduction of all expenditures per time than the original surplus. If he devotes his effort to the production of 'capital' this newly created capital may be lent to other individuals and an individual will demand a payment on the capital. The interest rate of the leased capital is calculated by the division of the yearly net product by the wage of one year's labor. If everybody in the community has been supplied with capital, a new and different capital production will arise. But this newly produced capital yields not the same return, it results in a smaller increment in revenues. The rent is determined by the division of the net revenue from the last increment divided by the wage rate. Consequently, interest falls with the increase in capital units and wages rise. Higher wages will increase the cost of capital production because it is a body of free individuals who will produce just that amount of capital which will maximize the revenue obtainable from the investment of one year's surplus.
This example of original accumulation also serves as a demonstration that capital is the product of labor. But he only sees capital as a productive force to increase labor productivity and does not imply a certain social relation.

Unfortunately, in this fertile paradise where v. Thünen places the cradle of humanity, the iron law of overpopulation limits living space and drives people out of this paradise. "This course of development is based on the spiritual constitution of man, his distinctive wish to increase his well being and it is also based on the condition of the physical world and is so natural that we can consider the spread of humanity through migration over the whole world as being in accordance with the plan for the world."

Turning now from this paradise, the paradise of the isolated state, at the outer edge of the featureless plain where land rent is apparently zero, the total net product of production can be distributed between the capitalist and the worker. Further, the wage rate and interest rate will be determined here for the entire state. Wages are above subsistence level. This 'fact' is gained out of empirical evidence. The wage rate must have been higher than the subsistence level because of population increase. From this, it follows that the worker had more than to starve. He assume \( a + y = w \), where \( y \) is the surplus for accumulation, \( q \) the minimum quantity of capital for the development for a new estate for a working family, \( p \) the net product, which a family can produce if assisted by \( q \) units of capital (all numbers are measured in wheat) and \( r \) is the interest rate on capital. It follows that: \( p = w + q.w.z \)

\[
\begin{align*}
\frac{p}{w} &= \frac{p-w}{(1 + qz)} \\
\frac{z}{q.w} &= \frac{w}{(1 + qz)}
\end{align*}
\]

Unknown are \( z \) and \( y \). The investigate the relation between the surplus over the subsistence level (\( a \)) and the interest rate, he assumes that at the fringe of his isolated
state workers will combine in order to set up a new estate beyond the fringe. One part of this freely-associated body will give their surplus \((y)\) to the 'capital' producing worker beyond the fringe. Thus "the new estate costs labor only,"\(^{212}\) he writes, and "the revenue that the estate brings, therefore, falls only and entirely to the capital producing workers, who have created that estate by their labor, and this revenue is the wages of their labor."\(^{213}\)

The shortest and most accurate description of v. Thümens derivation of his formula is to be found in W. Bräuer, which we will reproduce in the following:\(^{214}\)

A. Time required for the setting up of an estate

I. Group of working labor for wages to save

<table>
<thead>
<tr>
<th>number of workers</th>
<th>(n_s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>means of subsistence/worker/year</td>
<td>(a)</td>
</tr>
<tr>
<td>wages/worker/year</td>
<td>(a + y)</td>
</tr>
</tbody>
</table>

II. Construction worker of the new estate

<table>
<thead>
<tr>
<th>number of workers</th>
<th>(n_c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>subsistence requirements/worker/year</td>
<td>(a)</td>
</tr>
<tr>
<td>subsistence for all workers of a group II for all years</td>
<td>(a \cdot n_c \cdot q)</td>
</tr>
<tr>
<td>surplus for 1 construction worker by the savers group for all years</td>
<td>(y \cdot n_s \cdot q)</td>
</tr>
</tbody>
</table>

It follows that:

\[
y \cdot n_c \cdot q = a \cdot n_c \cdot q
\]

\[
y \cdot n_s = a \cdot n_c
\]

\[
\frac{n_s}{a/y} = n_c
\]

<table>
<thead>
<tr>
<th>number of workers</th>
<th>(n_s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n_c)</td>
</tr>
</tbody>
</table>

\(\frac{a}{y}\)
This relation determines the number of construction workers who can live off the surplus if \( y \) is known. After the completion of the estate beyond the fringe, the 'new capitalists' will operate the estate with hired wage labor. It follows:

B. Period of completion

I. The new owners are:
\[
ns + nc = nc + \left(\frac{a}{y}\right) nc
\]
\[
= nc \left(\frac{1 + a}{y}\right) = nc \left(\frac{a + y}{y}\right)
\]

II. Their employers are:

<table>
<thead>
<tr>
<th>number</th>
<th>( ne )</th>
</tr>
</thead>
<tbody>
<tr>
<td>wage</td>
<td>( a + y )</td>
</tr>
<tr>
<td>sum of wages</td>
<td>( ne , (a + y) )</td>
</tr>
<tr>
<td>net product/worker</td>
<td>( p )</td>
</tr>
<tr>
<td>total product</td>
<td>( ne , p )</td>
</tr>
<tr>
<td>total net revenue</td>
<td>( ne , p - nc , (a + y) = R )</td>
</tr>
</tbody>
</table>

The annual revenue will be divided among the capital producing workers \((ns + nc)\)

\[
r = \frac{R}{ns + nc} = \frac{ne}{nc} \cdot \frac{(p-a+y) \, y}{(a+y)}
\]

Now the unknown \( y \) can be solved under the constraint - at what value of \( y \) does the function reach its maximum. By differentiation, v. Thünen gained:

\[
\frac{dr}{dy} = \frac{ne}{nc} \cdot \frac{(y + a) \cdot ((p-a) - 2y) - ((p-a) \, y) - y^2}{a + y} = 0
\]

it follows

\[
a + y = \sqrt{ap} \quad \quad \quad y + \sqrt{ap} - a
\]
\( a \cdot p = w \) he declares as the natural wage, established neither by supply and demand, nor by the needs of the workers but by the free self-determination of the workers, themselves. Further, he carried his calculation on to find the equilibrium interest rate under which condition wage labor gets for its surplus the highest interest rate.\(^{215}\)

\[
z = \frac{p - a + y}{q(a + y)}
\]

\[
y = \frac{p}{1 + qz} - a
\]

The revenue which the worker received by investing his year's surplus is:

\[
\ldots = \frac{p \cdot z - az}{1 + qz}
\]

It follows:

\[
\frac{(1 + qz) pdz - pdz}{(1 + qz)^2} - adz = 0
\]

\[
z = \frac{\sqrt{ap} - q}{aq}
\]

Substituted in the wage formula:

\[
a + y = \frac{p}{1 + qz}
\]

we get \( a + y = \sqrt{ap} \) again. The workers could gain under these conditions if the wage is \( \sqrt{ap} \), the highest interest rate and their interest rate is congruent to those of the capital producers.

So far v. Thünen uses the isolated state as the object of demonstration for his economic theory. Towards the end of his second book, he is partially abstracting from the spatial context and is analyzing the relationship between capital and labor as well as interest rate on marginal land because rent, for him, is not a 'factor' of production.
Most significant for these demonstrations is the version of the principle of marginal productivity. His analysis is divided into two parts, once labor is held constant and capital may vary. The result he gains is that the last quantity of capital added determines the interest rate. Further, he analyzes under this condition the wage rate; the interest rate is determined marginally while wages are determined residually.

That means that wages are equal to the net product of labor after interest has been deducted from it.

Then he reverses the analysis and holds capital constant while labor is variable. Wages are determined marginally which means that wages are equal to the surplus product produced by the last added quantity of labor. Further, he realizes that this law can only be true in a large enterprise. Here the capitalist may employ labor up to the point where the wage of the last employed worker equals the marginal net product.

Both of these examples demonstrate that under equilibrium the natural wage has to be \( \sqrt{ap} = w \), if the net product, after the deduction of the interest on capital, should be distributed between capital and labor.

Further, he demonstrates the equilibrium relationship between the quantity of labor and the quantity of capital employed by a capitalist. Modern economists would call it the marginal rate of substitution. For v. Thünen this question arises out of the knowledge that capital is a substitution for labor; as capital is the product of human labor. The question is asked at which point it is no longer useful to substitute labor for capital or vice versa. The ratio between capital and labor employed in production is in equilibrium if \( k \), the rate of substitution of one unit of capital for one labor, equals \( 1/z \).

He summarizes his analysis as follows: "we have now sought to determine the relationship between wages and the rate of interest according to four different methods and points of view. We have investigated capital production through labor, then (2) treated capital as substitution for labor. Further (3) we have determined the rate
of interest through the use of the last invested small unit of capital and, finally, accepted the surplus product of the last employed worker as the measure for wages. Now since through all of these investigations the wage \( \sqrt{ap} \) has been triumphant, . . . I am permitted to lay down the proposition that the natural wage is \( \sqrt{ap} = w \).

This, however, only holds for the isolated state where worker and capitalists are living in harmony and are protected against misery and poverty. As always, v. Thünen applies his inquiry to the real world where no free land is to be found and the exploited worker has no possibility to cultivate unused land. Knowing that the wage \( w = a + y \) and the interest rate is \( z = \frac{p - w}{qw} = \frac{p - (a+y)}{q \cdot (a+y)} \) and (a) is the subsistence level, it is in the interest of the capitalist to diminish \( y \), driving the wage down to the subsistence minimum and increasing the interest rate on invested capital. In this contradicting interest, he sees the "perpetual opposition of the proletariat and the owners as enemies" and this will "stay unreconciled as long as the division in this interest is not eliminated." It is important to note here again the method employed by v. Thünen - he always compares his abstract model with reality.

4.0 The Critiques

Criticism of v. Thünen's economic theory is widespread among modern economists and is mainly based on three facts. One is the assumption that capital is the product of labor and is a dead thing without labor. The second critique is the assumption that the capital producing worker finds it to his interest to maximize the yearly revenue and the third error usually is attributed to the subsistence theory of wages. Admired mainly in his work is the use of the marginal productivity theory, the application of mathematics, and his deep concern about social problems and by location theorists, his spatial allocation model.

Our interest here should focus on v. Thünen's capital theory because this opened a
twofold critique that mentioned from the modern economists and also the critique from a Marxian point of view.

Capital undoubtedly is a productive force. Men can produce nothing without capital, especially under the conditions of Western Europe. V. Thünen reduces capital to men's labor. If $Q$ is a sum of capital, expressed in bushels of rye or in talers, over which a capitalist has domination, and $(a+y)$ is the wage of a working family per year, measured in the same units as $Q$, talers or bushels of rye, then $Q/(a+y)$ describes the size of capital expressed in yearly work of a family or indicates about how many years work of a working family a capitalist can command with a capital $Q$. This ratio is similar to the Marxian expression of the organic composition of capital. $(C/V$, v. Thünen measures this relation consequently in man years, which can be demonstrated by his dimensions: 
\[
\frac{a}{a+y} = \frac{\text{rye}}{\frac{\text{rye}}{\text{man years}}} = \text{man years} = nq.
\]

By this $(nq)$, he understands the employed number of workers per year, where $n$ is the number of workers. If we divide the expression $nq$ by $n$, we gain $q$ the amount of capital measured in years work per man. The amount of capital used by the worker is measured obviously in labor time to produce a unit of capital. But capital is a productive force, that means it can contribute to the production process. For v. Thünen it is of importance to determine the most efficient relation between capital and labor. Because capital and labor are measured in the same dimensions, the interest rate determines the relation between the efficiency of capital and labor. Thus he is able to "reduce to labor the contribution of capital in the production of an exchangable good. By this reduction, it is possible to measure capital entirely in labor cost of production if there is no economic rent involved and labor therefore becomes truly the yardstick for exchange value." V. Thünen assumed that market prices in the long run are in equilibrium with the cost of production. There cannot be any deviation of value
from prices and shows "neither losses nor uncommon gains."\textsuperscript{221} The answer is "if by adjustment in the prices of goods, labor of equal quality in all industries is paid the same, equilibrium is reached and this average compensation is the yardstick for the production costs as well as for gain and loss."\textsuperscript{222} The second condition for the existence of such an equilibrium is the assumption "that the use value or utility of the good is at least equal to the cost of production."\textsuperscript{223}

The transformation from value into prices is then only a simple problem. v. Thünen sets the value of a 'standard community,' in his example, silver, equal to other commodities at the margin of cultivation. The formula $a + y = \frac{p}{1 + qz} = w$ expresses the contribution of wage labor to the product $p$. Constants are $p$, $q$, $z$, while $w$ is the variable. He assumes that $w_j = w_i (i = 1 \ldots n)$ where $j$ stands for the standard commodity silver and the indices $i$ for all other commodities. However, he only regards $i$ in terms of rye, where the margin of cultivation ends. $z$ is the interest rate for the use of capital throughout the isolated state; while $p$ is the net product. Q, the organic composition, may vary between the different production of the commodities. The transformation into a standard commodity must hold at the margin of cultivation

$$w_j = \frac{p_i}{i + q_i \cdot z}.$$  

The exchange rates between various commodities can be determined at this margin and the equilibrium between value and production prices is reached at that margin. Here rent is excluded from the analysis. The interest rate is determined by the ratio of the productivity of capital in relation to human labor. Capital $q$ measured in man years. He gains $z = \frac{p - w}{q \cdot w} \Rightarrow w + wqz = p$ the net product. If $z$ and $w$ are known, the net product can be distributed between monsieur la capital and its slave.

The exchange value ratio differs over the isolated state because transportation costs vary with distance. For the 'standard commodity,' he assumes transportation
costs equal to zero; for all other commodities, transportation costs vary with distance.

It follows that the exchange value between rye and silver, for example, at the market center is different from that at the margin of cultivation. However, the product of transportation is always equal to its value.

In this transformation, the rate of profit is given; while in the isolated state the profit rate, which regulates the distribution of revenue between the agents of production, is established by the contribution of a freely associated body of workers, who are distributing the net revenue among the 'factors of production.' While in the aforementioned example, v. Thünen assumes a variation in the organic composition of capital. At the frontier, where the profit rate and the wage rate are determined by the distribution of net revenue, he has to assume a uniform capital labor ratio. The yield and the minimum capital are given and the same for all workers who are trying to set up an estate beyond the frontier. This assumption results in a uniform profit and wage rate throughout the isolated state where a deviation of prices from value doesn't exist. Consequently, in the state under static equilibrium conditions, no excess profit can exist because labor power is free to develop marginal land, which will diminish these extra profits.

At a first glance, v. Thünen's model implies a harmony between different kinds of owners. One is the owner of the means of production; the other as the owner of labor power, and they appear as equal human beings. Reality should be directed according to this model of harmony. However, in the determination of the net product (p), already the class relationship has entered. His abstract model and the harmony is a veiled harmony.

This analysis demonstrates that the societal system v. Thünen envisages is a form of social capitalism, a society of moral capitalism. On the other hand, v. Thünen's theory can be subsumed under the notion of vulgar economy, as Marx called this form.
The product of labor is the residual after the deduction of everything, "that is necessary for the full maintenance of the buildings and of inventory, what is necessary for seed for fodder, for the cost of administration and the normal profit of the entrepreneur and in general, all that is necessary for the upkeep of the economic unit; then neither for the owner of the estate, if this is leased out, nor for the laborer is there any special advantage" from the gross yield of an estate or enterprise. This surplus which is left for distribution is called the product of labor and measured in units of one laborer. This surplus is distributed among the factors of production, here capital and labor according to its marginal productivity as mentioned above. So the interest rate is the product of capital and wage is the product of labor; for v. Thünen the geometric means between the product of the necessary sustenance level and the net product.

Crucial for all vulgar economists is the understanding of the form of the capitalistic production process in its twofold character. The production process of capital, on the one hand, is the real process of work, and, on the other hand, is the utilization process of capital. The former describes the use value side, in which capital exists at the end of the production process; the latter describes the renewal of capital as capital, exchange value.

The appearance of capital as capital in the working process has a threefold determination. First it is the conceptual separation and independence of the means of production. The second is the separation of the objective and subjective conditions of work (the labor itself) and thirdly, it is embedded in the totality of the interdependence of the subjective and objective moments as the real appearance of capital within the process of production or the appearance of the use value of capital, as use value producing process.

The utilization process of capital as capital includes the productive consumption of constant capital (raw material and depreciation of the means of production),
reproduction of the living factor of the production process and its possibility to produce a surplus above its value. An important distinction for Marx, however, is the identity of the appearance of capital in the form of use and exchange value within the immediate process of production and the disintegration of the double character of labor power. The exchange value of variable capital in the utilization process is substituted for its surplus setting and preservational capability. The first result of the capitalistic process of production we gain is the reproduction of capital as capital in its double relation. The second result is the joint yield of capital and revenue of labor as the reproduction of the source of value. The 'revenue of capital' serves as the continuous expansion of capital production and accumulation of capital. What we gain is that labor reproduces capital and labor power. With the abstraction from gross product and the concentration on the net product, the reproduction of capital is insured and thus can only be done if capitalism is regarded as the natural form of society. The net product is obviously produced in the production processes by the "best combination" or "productive contribution of the factors - labor, capital, (and land)"; what is general is not answered is how this surplus is produced.

Man, since his appearance, has always produced necessaries with the interaction of the means of production within the laws set by nature or the means of production. However, by this kind of factor, combination products are produced but not a specific capitalistic production process resulting in a commodity production or in the realization of a surplus if sold. Only by the disintegration of the double character of the commodity, labor power, a specific capitalistic production process can appear. Labor power realizes its exchange value, while the use value for a certain amount of time has gone to the owner of the means of production. "Therefore, the value of labor power and the value which that labor power creates in the labor process are two entirely different magnitudes, and this difference of the values was what the capitalist had in view when he was purchasing labor power. The useful quality that labor power
possesses and by virtue of which makes yarn or boots, were to him nothing more than a condition sine qua non, for in order to create value, labor must be expended in a useful manner. What really influences him was the specific use value which this commodity possesses of being a source not only of value but of more value than it has itself.²²⁹

Our social capitalist may agree to this but he sees the productive function of capital in matching labor power with the means of production in order to produce a surplus. This surplus is the jointed increment of this combination of labor and capital. Consequently, the worker may deduct his reproduction cost and capital, its cost of reproduction, and the residual surplus is left open for distribution. But this only can be realized in an ideal state, not in the real world. V. Thünen only regards the quantitative aspect, the distribution of the surplus, not the qualitative side, the production process as use value. At the fringe of the isolated state, a free body of workers may set up an estate. After this process, they will employ wage labor and the surplus will be distributed between the two groups. Apparently what happens at the frontier is the following - some workers become capitalists by producing capital beyond the frontier. For the wage laborer on the newly created estate, capital will appear as an alien force. The realm of freedom only can be reached if this capital labor relation within the working process is destroyed. "Freedom in this field can only consist in socialized man, the associated producers, rationally regulating their interchange with nature, bringing it under their common control, instead of being ruled by it as by blinded forces of nature."²³⁰

This abstraction of capital as a societal relation is the source of the mystification of the capital labor relation. Capital as capital has to stay intact and the wrong minded communists demanding the destruction of the property relation only can bring evil to the totality of the society. And the perpetuation of capitalism is insured with the assumption of the distribution of the net product. The perpetuation of the idea of the world spirit as capitalism is taken as eternal law in which exploita-
exploitation is substituted for morality. 'Capital feeds labor as labor feeds capital.'

Between the capitalist and labor power exists an intimate bond. V. Thünen proves this relation with two examples. The underlying assumption for this proof is that the individual factory owner never would undertake any work which would not bring back the costs and needlessly sacrifice his fortune. If the number of workers stays constant but wages increase, the last employed worker would bring more cost than revenue. Consequently, the capitalist will lay off workers until the value of the product of the last employed worker equals its wages again. Increasing wages will lay off workers and in order not to starve, they will decide to work for a lower wage rate. On the other hand, if the population increases while capital remains the same size, the additional worker can't find employment at the existing wage rate. The worker will be content with a decreasing wage rate. The frontier of the wage rate will be the absolute necessary subsistence level where workers can reproduce themselves. V. Thünen, however, realizes that the wage rate can fall temporarily beyond the necessary subsistence level. But 'religion and humanitarianism make it a command and all governments acknowledge its duty to let no human being die from want. All those whose work product is not sufficient to cover their subsistence fall into the care of the poor fund.' Further, he assumes that while the population rises, capital and cultivated land maintain the same size 'and it is easy to prove that when the latter grows but in a smaller degree than the population' the same result occurs: 'peace breeds prosperity, prosperity overpopulation, overpopulation misery.' Peace equals misery and the question is asked how to solve this witch's round! The answer is social capitalism, which he understood to safeguard under the cloak of social activity the utilization of capital by preserving the commodity labor power, the source of surplus value. While economic doctrines have undertaken the mere task 'of understanding the actual relation between ownership and labor,' socialism for v. Thünen 'is based in the idea of human determination.' His discovery of the formula \( \sqrt{ap} \) insures the perpetuation of capitalism.
by upgrading the condition of the working class. And the discovery of the natural wage will destroy socialist fantasies which rise out of their ignorance of laws of economics.\textsuperscript{235} Thus private property relations are eternal and capitalism is safeguarded against its final breakdown.

5.0 Summary

V. Thünen's vision of social capitalism can only be realized in his abstraction from reality and reality should be formed according to this abstraction; reality is turned over on its head. What was demonstrated here is that the isolated state is not only a model for the location and spatial arrangement of land use, but that it serves as an economic model. It is the typical Robinsonade of political economy, where the relation between capital and labor are clear and not veiled in their societal relation.

Linking wages to the net product insures that labor power will work their asses off to increase the net product and their wages and secondly insure that capital can accumulate and can subsume all parts of the social life under its pertinent power. Profit sharing by maintaining private property relations is not a concept of harmony but the most inhuman relation, which can only be bred out under a science which has devoted its total purpose to safeguard private property relations.

A. V. Thünen-like proposal had been applied to post-war Germany (FRG) by Father Oswald v. Nell-Breuning under the Erhard administration.\textsuperscript{236} While the surplus wage ($y$) was taken out by a government tax program favorable to investment combined by a strong self-denying policy on strike by labor\textsuperscript{237} gave rise to a capitalist Germany, with a perfect unequal distribution of wealth. While wages increased 12\% from 1950-1968, the share of wages in the net social product increased only 6\% Thus the relative share of wages in the net social product decreased while Mosieur la Capital increased his share, and this even by a strong incentive for creation of wealth.
In his spatial allocation model v. Thünen analyzes which economic activities will be performed under optimal conditions, that is to say, to maximize net product before rent. His model gives a detailed description of at what distance certain economic functions can be performed. Labor power is of uniform rationality throughout the state but linked with the net product via the natural wage. There is no indication what are the locational conditions and decisions of the source of the surplus labor power. All that can be assumed is that by linking wages with the net product, locational decisions will be linked with the net product, the intimate bond of labor to capital. But this intimate bond is a one-way street. Labor power is subsumed under the domination of capital as capital. Free choice in residential decisions appears only as the appendix of this capital labor relation because by abstracting from the distribution of wealth it is implicitly assured that capitalism as capitalism can survive. By abstracting from the double character of capital and viewing only the productive force of capital and its utilization process, v. Thünen falls under the "hypocrite apologist for capitalism" and his theory is pure ideology. It serves to veil the working process where the societal relation of the subject interacting with converted nature takes place. Thus, all the more, the ideal state is taken as the central world philosophy, according to which reality should be formed.

So far v. Thünen's contribution to location theory and his economic model has been mainly separated in their interpretation in modern literature. Our interest here was to reassess that between both there exists an inseparable linkage in a way that the location model is the necessary precondition for the construction of his economic model. Further, it was the task to demonstrate that his economic model of the isolated state as an abstraction of reality is subsumed under a normative judgment, which may be called social capitalism.
Today, such normative judgments are hardly openly admitted and have to be assumed in the mentioned preconditions, e.g., E. Hüls starts off in his "Studies in the Structure of the Urban Economy" that the main focus of the monograph is positive economics or Alonso with the introduction of the "homunculus economicus." Even v. Thünen's work is embedded in a central world view that his work, however, stands above his latter followers. It is the first attempt to develop an integrated spatial economic model. Spatial aspects in general normally complicate economic analysis in someways. On the other hand, the affinity between linear analysis and economic equilibrium theory have the tendency to reduce location to a format where the geometry of space completely disappears and is replaced by an abstract framework of matrices. Complaints about the growing use of applied mathematical techniques, however, is not the question of the validity of a theory. The mathematical methods only can serve as means bound to a framework of the economic theory. The question of the validity or degree of scientific character of an economic theory falls totally outside of the use of mathematics. Mathematics only can be applied if the entity of the categories in their interdependencies is analyzed in a proper way. Because bourgeois science, and we can subsume v. Thünen under this class of science, abstract from the analysis of the qualitative relation between capital and labor, the use of mathematics is scientifically limited and can be inverted then to veil the social relation away from a better understanding of the complex reality.
158. ibid., p. 283 (Part II, Section II, p. 117).
159. ibid., p. 266 (Part II, Section II, p. 71).
160. ibid., p. 266 (Part II, Section II, p. 72).
161. ibid., p. 267 (Part II, Section II, p. 74).
162. ibid., p. 271 (Part II, Section II, p. 98)
164. ibid., p. 312/313.
166. ibid., p. 642 (p. 649).
167. ibid., p. 688 (p. 676).
168. ibid., p. 689 (p. 677).
169. ibid., p. 759 (p. 751).
170. ibid., p. 759 (p. 751).
171. ibid., p. 766 (p. 758).
174. ibid., p. 31 (p. 37).
176. ibid., p. 765 (p. 757).
177. ibid., p. 771 (p. 762).
179. ibid., p. 299 (p. 303).
181. ibid., p. 783 (p. 775).
183. See Karl Marx, letter to F. Engels in: MEW 30, p. 274, v. 9.8.1862

184. Karl Marx, Theorien ...., op. cit., p. 38 (p. 45).

185. P. Hall, op. cit., p. 195ff (p. 328ff).

186. ibid., p. 201 (p. 336).

187. ibid., p. 205 (p. 341).

188. ibid., p. 205 (p. 342).

189. ibid., p. 207 (p. 345).

190. ibid., p. 208 (p. 345).

191. ibid., p. 211 (p. 350).

192. ibid., p. 213 (p. 353).


195. ibid., p. 213 (II, 1 33).

196. ibid., p. 217 (p. 36).

197. ibid., p. 217 (p. 36).

198. ibid., p. 340.

199. Karl Marx, German Ideology, op. cit., p. 58.

200. ibid., MEW 3, p. 45 (p. 64).


202. ibid., p. 327 (p. 206).

203. ibid., p. 219 (p. 40).

204. ibid., p. 219 (p. 40).

205. ibid., p. 219/220 (p. 41f.).

206. ibid., p. 224 (p. 48).

207. ibid., p. 224ff (p. 48ff).

208. ibid., p. 221.

209. ibid., p. 222.
References

210. ibid., p. 224 (p. 48).
211. ibid., p. 267 (p. 115).
212. ibid., p. 288 (p. 147).
213. ibid., p. 288 (p. 147).
216. ibid., p. 324 (p. 202).
218. ibid., p. 326 (p. 205).
220. ibid., p. 273 (p. 124).
221. ibid., p. 278 (p. 133).
222. ibid., p. 278/279 (p. 133).
223. ibid., p. 279 (p. 134).
224. It costs 12 \( YW = q \) to set up a new estate, von Thünen, p. 145ff.
225. Dempsey, op. cit., p. 244 (p. 77).
227. ibid., p. 9.
228. E. Altvater, Materialien, op. cit., p. 7.
232. ibid., p. 314 (p. 186).
233. ibid., p. 315 (p. 187).
234. ibid., p. 316 (p. 189).
235. ibid., p. 316 (p. 189).
236. From Dempsey, p. 154.
237. Beckman, op. cit., p. 5.
BIBLIOGRAPHY

Abendroth, Wolfgang
"Alternativen der Planung" in Arch 7, Stuttgart.

Altvater, Elmar

Altvater, Elmar

Alonso, William

Beckmann, Martin

Bhaduri, A.

Boehm-Bawerk
Grundzuege des Wirtschaftlichen Gueterwertes

Boeventer, v. Edwin

Boeventer, v. Edwin

Bowman, Ward

Braeuer, W.
"Falsche Deutungen v. Thuenenscher Begriffe und die sich daraus ergebenen Konsequenzen fuer die Rekonstruktion der Lohnformel," in: Jahrbuch fuer Nationaloekonomie und Statistik, Jena, Fischer, 1940.

Burgess, E. W.

Chadwick, George

Clawson, M.
Bibliography

Dobb, Maurice

Dempsey, W. B.

Eberstadt, Rudolf
Handbuch des Wohnungswesens und der Wohnungsfrage, Jena Fischer, 1920.

Ely, Richard and Wehrwein, G. S.

Engels, Friedrich

Engels, Friedrich

Engels, Friedrich

Farhi, Andre

Ferguson, C. E.

Frey, R. L.
Infrastructure, Tuebingen, 1970.

Friedman, Milton

Friedrich, Carl J.
Alfred Weber's Theory of the Location of Industries, Chicago, 1929.

Fritsch, B.

Fromm, Erich
Marx's Concept of Man, Frederick Ungar, N.Y., (Economic and Philosophical Manuscripts of 1844).

Gaffney, Mason

Habermas, Juergen
Knowledge and Human Interest, Beacon Press, 1971.

Habermas, Juergen
Bibliography

Hall, Peter

Harris, C. Ullmann, E.

Hirsch, Werner Z.

Hirschman, A. O.

Hoch, Irving

Hoover, Edgar M.

Hoyt, Homer

Kade, Gerhard

Kuhn, Thomas

Lange, Oskar

Lauschman, Elizabeth

Leigh, Arthur H.

Loesch, August
Die räumliche Ordnung der Wirtschaft, Jena 1940 (engl. The Economics of Location, John Wiley & Sons, N.Y., 1967).

Mandel, Ernest
Einfuehrung in die marxistische Wirtschaftstheorie, EVA, Frankfurt, 1969.

Marshall, Alfred

Marx, Karl

Marx, Karl
Bibliography

Marx, Karl

Marx, Karl

Marx, Karl

Marx, Karl

Marx, Karl

Marx, Karl

Marx, Karl

Marx, Karl

Menger, Carl
Grundzuege der Volkswirtschaftslehre, Wien, 1871.

Meyer, W.

Michalski, Wolfgang

Mills, Edwin S.

Muth, Richard
Cities and Housing, University of Chicago Press, 1969.

Myrdal, Gunnar

Nurse, Hugh O.

Nurse, Hugh O.

Pahl, R.
REFERENCES

Introduction


04. Juergen Habermas, ibid., p. 4.


06. Paul Streeten, op. cit., p. 63.


08. G. Kade, op. cit., p. 88, p. 94.


6. Karl Marx, Deutsche Ideologie, op. cit., p. 30, (P. 50)

7. ibid., p. 30 (p. 51).
8. Jürgen Habermas, op. cit., p. 92.


10. Karl Marx, Deutsche Ideologie, op. cit., p. 31 (p. 51)

11. ibid., p. 31 (p. 51).


15. ibid., p. 26, 27 (p. 47).

16. ibid., p. 30, (p. 50).


20. ibid., p. 543 (p. 129)

21. ibid., p. 545 (p. 131).

22. Jürgen Habermas, op. cit., p. 94ff.

23. ibid., p. 97.

24. Karl Marx, Resultate, op. cit., p. 46.

25. ibid., p. 49.


27. ibid., p. 331ff (p. 312ff).


32. ibid., p. 593 (p. 142).

33. ibid., p. 593 (p. 142).
References

34. Karl Marx, Results, op. cit., p. 50.
35. ibid., p. 77-84.
36. ibid., p. 79.
37. ibid., p. 81.
38. ibid., p. 82.
40. ibid., p. 109.
41. Karl Marx, Grundrisse, op. cit., p. 593 (p. 142).
42. Ernest Mandel, Einführung in die marxistische Wirtschaftstheorie, EVA, Frankfurt, p. 2. Demonstrating this with an example of a fully automated working process.
43. Jürgen Habermas, op. cit., p. 111.
44. ibid., p. 111.
45. ibid., p. 111.
48. Elmar Altvater, Materialien zur Kritik der bürgertlichen Wirtschaftstheorie, Rotdruck, p. 16.
49. Karl Marx, Deutsche Ideologie, op. cit., p. 18. We, however, can't agree to Engels point in the "Introduction to the Critique of Political Economy" (ausgewählte Werke I, p. 341) where he separates natural science from history.
References


61. F. Engels, ibid., p. 48 (p. 134).

62. Karl Marx, ibid., p. 136 (p. 201).


64. Karl Marx, Grundrisse, op. cit., p. 205.


66. ibid., p. 3.


70. Ibid., p. 95.

73. ibid., p. 12.
74. ibid., p. 16
76. See Bövener, op. cit., p. 325 or H. Richardson, Urban Economics, Penguin, 1971, p. 15.
77. In a recent paper A. Fhadi, A Theoretical Model of Urban Growth, paper presented on the European Congress of the Regional Science Association, 1972, is trying to develop a neo-Marxian urban growth model.
80. Jürgen Habermas, Knowledge and Human Interest, Beacon Press, 1971, p. 7. He writes "Every consistent epistemology is caught in this circle from the beginning. This cannot be avoided by beginning the critique with presuppositions that remain provisionally unproblematic but that in principle can be taken as potential problems for subsequent investigation."
86. M. Friedman, op. cit., p. 7.
87. ibid., p. 24.


92. M. Dobb, op. cit., p. 78.

93. The argumentation here follows very much the line of E. Altvater, op. cit., p. 38ff.


100. W. Alonso, op. cit., p. 15.


105. Hugh O. Nurse, Regional Economics, New York, 1968, p. 227ff. OR R. Frey, Infrastruktur, Tübingen, 1970, p. 29. He argues that the term social cost or social benefits is the most extended one and includes all kinds of externalities.


107. Hugh O. Nurse, op. cit., p. 231. "External benefits of costs to individuals in areas outside the area of the political decision - making organization will be called spillovers."


* 101 and 102 deleted.
References


115. E. Altvater, Gesellschaftliche ... op. cit., p. 12.


121. Lon Polk, op. cit., p. 16.

122. ibid., p. 7.

123. ibid., p. 10

124. E. M. Hoover, op. cit., p. 8


126. See e. g. W. Alonso's Muth's or Mill's models.


*110 and 111 deleted.


135. Dempsey, op. cit., p. 86.


139. ibid., 43.

140. ibid., p. 44.

141. ibid., p. 44.


143. ibid. see p. 34.

144. e.g. W. Alonso, op. cit., p. 15.


146. Cited from Beckman, op. cit., p. 61. Because this translation is closer to the original text.

147. Alonso, op. cit., p. 18ff.

148. The same holds for E. Mills as well as for Alonso's model, op. cit.

149. Von Thünen's Isolated State, op. cit., p. 229 (The Isolated State, Part II, Section One, p. 8).

150. ibid., p. 22 (Part I, p. 19).

151. ibid., p. 18 (Part I, p. 14).

153. ibid., p. 20 (Part I, p. 17).

153. ibid., p. 144 (Part I, p. 224).


155. ibid., p. 281ff (Part II, Section II, p. 115).

156. ibid., p. 282 (Part II, Section II, p. 116)

157. ibid., p. 283 (Part II, Section II, p. 117).
Bibliography

Perroux, Francois

Pigou, A. C.

Predoehl, Andreas
Staatsraum und Wirtschaftsraum, Kommissionverlag Lipsius & Tischer, Kiel, 1935.

Polk, Lon

Reichelt, Helmut

Richardson, Harry W.

Riese, Harro

Robbin, Lionel

Robinson, Joan

Robinson, Joan

Rosdolski, Roman

Samuelson, Paul

Samuelson, P. A.

Schumpeter, J. A.

Streiten, Paul

Thuenen, von J. H.
Bibliography

Vito, Francesco

Weber, Alfred
"Industrielle Standortslehre (Allgemeine und kapitalistische Theorie des Standorts) in: Grundrisz der Sozial oekonomik, Tuebingen, 1914, III Buch, B. I.III.

Weber, Alfred
Ueber den Standort der Industrien, Tuebingen, 1909.

Weber, Max

Wicksell, K.

Wingo, L.