Chapter II

History of Space and Spatiality as Railway Technology

Introduction

In this chapter I would like to show how railway technology seems to have altered the notion of space just as it has done with time. Perhaps the railway has altered physical space itself as it appears on the surface of Earth. With the advent of the railways a transformation seems to have occurred in the way how space was perceived so far by people. Even though terms like 'shrinking of space' and 'annihilation of space', etc. are metaphorical expressions, I think that the spatial transformations by this technology is worth investigating to understand the impact of this particular technology on spatial conceptions and perceptions.

In this chapter, firstly I would try to understand how space is perceived by human subjects. I will consider different theories of space formulated by different thinkers at different points of time and in different ages. I will also like to consider the insight received from these theories as the basis to understand the role of railways in altering the concepts of space and how the same is reflected in railway fiction. Secondly, I would take a brief survey of the history and development of conceptualizing space which is spread across different disciplines such as Mathematics, Philosophy and Natural Science over a number of years. I would also try to understand space in its various manifestations, categories, implications and limits.

The dictionary meaning of space is: 'the unlimited or incalculably great three dimensional realms or expanse in which all material objects are located and all events occur'.[1] So space may be called as the fundamental basis of all existence, whether it is living beings, inanimate objects or abstract concepts. This calls for questions like: 'How vast is the universe?', 'Does

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[1] <http://dictionary.com/browse/space>

it have any borders?', 'And if a border does exist, what is beyond it? And many more that are still to be answered.

Trying to Locate the Origins of Space as a Concept

Search for origins is a human predisposition even when they are aware that it is a futile exercise and all that they come across would be some originary myths about the creation of space. One of the major spatial concepts that developed during the middle ages in Europe was based on the Christian faith of the three spheres, 'the three cosmic levels—earth, heaven', and 'underworld' (Eliade 36). Earth was thought of as the flat physical space, hell the underworld below the earth, and the universe with the heavenly bodies moving around—all created by God. In Greek mythology, Elysium or the Elysian field is a land of perfect happiness at the end of the Earth, a particular part of the cosmos where heroes and those favoured by the gods went after death.[2] According to Judeo-Christian faith it is the word of God that has created the world, as: 'In the beginning God created the heavens and the earth' according to the Book of Genesis in the Old Testament (Genesis1).

One of the most popular Chinese myths is that of a cosmic black egg that floated within the timeless void. After eons of incubation the egg broke and the first being Pangu emerged. The opposing two parts *yin* and *yang* separated to be earth and sky respectively and Pangu stood upon the earth and held the sky apart and grew himself as the gap widened. When he died, his body parts transformed into different elements of the universe.[3] The Greeks had many myths of creation, of which one is that out of primordial chaos the earliest divinities emerged including mother earth who created Uranus, the sky and they created both gods and

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[2] *Encyclopaedia Britanica*. Elysium: Greek Mythology.<https://www.britannica.com/topic/Elysium-Greek-mythology>.
[3] <http://www.ancient-origins.net/human-origins-folklore/australian-aboriginals-creation-myth-00229>

monsters.[4] Plato's Timaeus considers the creator to be good that s/he desired so far as possible all things should be good like her/him. So s/he took the world of matter, a chaos of disturbance and confusion and brought it to order and gave it life and intelligence (Plato 90).[5] According to the Vedic philosophy it is the spoken word AUM by *Brahma* that created the universe while time and space existed in *Brahma* for ever before the creation. The cosmic energy through the word in passage of time formed particles and these particles formed atoms (*anu* and *kanu*) and the combination of these building blocks formed five *Mahabhutas*-ether, air, water, fire and earth. Before the creation by the Cosmic Word, there was neither existence nor non-existence, there was no sky, no earth, no air, and no sign of day and night. Darkness prevailed and it was more of a 'plasmic continuum' (Sabhlok 2015). The notion of creation by the word AUM by Brahma is similar to the Biblical version of creation, though the process differs.

When the religions endorse the creation by God, and mythology has its various myths about the origin of space, science seems to have its own set of theories. 'Einstein's general theory of relativity, on its own, predicted that space-time began at the big bang singularity and would come to an end either at the big crunch singularity (if the whole universe recollapsed), or at a singularity inside a black hole' (if a local region, such as a star, were to collapse) (Hawking 61). Big Bang Theorists seem to have some explanations for the beginning as well as for the end of the universe. They believe that quantum mechanics can explain the dramatic effect of the big bang and the big collapse singularities in the universe and have answers for many of the questions on the universe. The Big Bang is the creation process and Big Collapse is the reverse or the destruction process. Within the construction of this theory there is a possibility for the beginning and end of space in a cycle of big bangs and collapses of the

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[4] http://www.livescience.com/11316-top-10-intelligent-designs-creation-myths.html
[5] Plato. *The Timaeus of Plato*. Edit. R. D. Archer. London: Macmillan. 1988, 90.

universe in a recurring, but very slow process. Stephen Hawking explains this process of creation and destruction of the universe or space with a 'zero size' and 'infinitely hot' universe at the time of the Big Bang which cooled down as it expanded. But the notion of an infinite universe has no story of a creation, no boundaries, and no end.

Historicizing Space

I would like to believe that human beings perhaps have always been aware of their surroundings with heavenly bodies revolving around. The cave dwellers' spatial concern would have been to find a cave safe enough to protect him/her from wild animals and nature's fury. Roaming in the natural wilderness must have, perhaps, aroused their curiosity to know what lay beyond. Perhaps, for centuries, human beings walked themselves to exhaustion hoping to conquer the unknown. The space they knew and lived in was a given and far and beyond too would have seemed alike, before the settlements, civilizations and industrialization altered that spatial outlook. When the human subject supposedly started settlements, areas with fertile soil near the water bodies became precious, valuable, and in demand. At the point when people began the practice of ownership of land, and the settlements increased and expanded, more such space was required for agriculture and live-stock and the production of more space perhaps evolved as a matter of concern. This demand perhaps encouraged further explorations and conquests to produce and occupy more such spaces.

Alvin Toffler calls the changes in civilization that alters life drastically, the waves of change, the third being in progress now. The first wave according to him was the agricultural revolution and the second, industrial revolution. He has tried to encompass the history of human civilization within the three waves the last of which is still blowing. He allocates a roughly demarcated time period for each wave to present the accelerated speed of change.

Toffler supposes that the first wave began about 8000 B.C. (30). Till then it was the nomadic life where our ancestors constantly on move, pursuing weather or game, 'were the original "high-mobiles"—travelling light, avoiding the accumulation of cumbersome goods or property, and ranging widely over the landscape (121). They had a 'spatially extensive' life because they travelled huge areas of space to fulfil their needs. Toffler explains this change:

> Before the First Wave of change, most humans lived in small, often migratory groups and fed themselves by foraging, fishing, hunting, or herding. At some point, roughly ten millennia ago, the agricultural revolution began, and it crept slowly across the planet spreading villages, settlements, cultivated land, and a new way of life. (29)

The agricultural revolution brought with it the thatch and roof civilization with the first built permanent shelters of thatched roofs of grass and leaves that improved to better and stronger materials gradually for humans as well as livestock. One does not know when the right to ownership of property itself began though we have a number of accounts about conquests and ownership of space. It might hence be impossible to historicize the origin of space ownership either by the hunter-gatherer, or by the agriculturists. Invasions and conquests perhaps began by this time as fertile land was in demand and ownership of the same could have been the symbol of power.

Toffler's second wave of industrial revolution started by the seventeenth century took almost three hundred years to spread its changes. The right of conquest or title by conquest that prevailed, until the world wars and the United Nations Charter signed in 1945 (Article 1-2), conferred by default the right of a territory to the conqueror. Space thus could be conquered and exoduses resulted as the displaced had to discover or conquer new spaces. Through colonial conquests of much of the world the colonizer acquired the right over the colonized space. While exploring the physical space thus for settlements, conquests, etc. people perhaps understood space by and large commonplace as that can be measured and owned though people belonging to certain communities did not believe in owning space and settling down.

Nomadic tribes and some aboriginal tribes do not still believe in the ownership of space as it is entirely there for them to traverse and live. Though space is thus identified, defined and lived in different perspectives, in different times and in different socio-cultural backgrounds, an all encompassing definition or an acceptable explanation is not plausible still. The third wave with its white collar jobs and 'widespread introduction of the computer, commercial jet travel, the birth control pill, and many other high-impact innovations', began in 1955 in the United States and soon arrived in all the other countries changing the economies and institutions of the previous civilizations (Toffler 30).

Space in Different Disciplines

Just as the origin of space is a contentious issue without a consensus, so are the notions of space that vary according to different times, persons, disciplines and cultures. Space for a long time was considered as a mathematical concept of empty geometrical area as depicted in Euclidian Geometry. Evolution of theories of space has got a long history of scientific and philosophic thinking. The Cartesian, Newtonian, Leibnizian, Kantian, and Marxist notions, working along with many others show how varied notions of space are. Many different theories and concepts seem to have developed from the physical, flat, and three dimensional spaces into a multitude of spaces like mental space, social space, architectural space, literary space, empty space, male space, female space and so on. Discussions of the nature of space, and of various issues related to space, like time, have always featured prominently in philosophy, and date back to antiquity; filled with hypothesis, postulations, theorization and contradictions. Mathematics, Physics and Philosophy have placed their claim intermittently to space which was previously considered to be the key concern of Geography with efforts to determine its definition, nature and existence. René Descartes, Spinoza, Gottfried Leibniz, Isaac Newton, Immanuel Kant, Plato, Aristotle, etc. are but a few of the philosophers who

had thought about this mystery and initiated discourses that were elaborately debated, opposed and reformulated as to whether space is absolute, relational or part of a framework.

Space is no longer restricted to the domain of any single discipline like geography or architecture, but spatial study has turned out to be an integral part of every discipline whether it is philosophy, literature, technical studies, psychology or any other subject one may think of. M.F. Goodchild in his article 'A Geographer Looks at Spatial Information Theory' differentiates geographic and spatial arrangements. He claims, 'geographic is a subset or specialization of spatial, which by extension refers to any spatiotemporal frame' (2001). Thus the spatial is drawn along with the temporal and not treated as an autonomous or independent category.

Spatial Theories: Newton, Leibniz and Kant

Three dimensional space as a mathematical concept had its dimensions: length, breadth and height. This space seems easily measured, mapped and understood and so like time, perhaps gets treated as a fact, and as Harvey explains: 'naturalized through the assignment of commonsense everyday meanings. In some ways more complex than time—it has duration, area, shape, pattern and volume as key attributes as well as distance—we typically treat of it as an objective attribute of things which can be measured and thus pinned down' (203). Space is not so simple, observable and comprehensible. Space is not just an object that we can measure, map and label, but it includes the complexities of the social, mental, communal, scientific, philosophic, linguistic, moral, imaginary, rational, conceptual and all other possibly conceivable constructs and hence is abstract. Social space and mental space are subjective and their attributes hard to be measured and pinned down. For some, space may be absolutely everything that is perceivable whether physical, social or mental. If the container is in space what it contains too is inner space. What exists within a boundary may be inner

space and outside the boundary outer space, like the inner space of a house differs from the outside. If a plain unoccupied piece of land is meant for a house, the house becomes a sort of bounded space for people to live in. If the piece of land is bounded by a river or any kind of a boundary, the land itself becomes inner space. The people in the building hold anatomical specifications of the inside of human body as well as mental space that includes memory, knowledge, imagination, etc. Mental space also contains thinking process and languages in which a person thinks with syntactic and semantic manifestations.

Observations and discovered facts help to form theories and advancement in science always lead to more discoveries that modified or challenged the previous ones. Hence it becomes impossible to accept any one of the theories, analysis, or definitions of space to be absolutely true, as there is no evidence enough to prove it, because space cannot be observed. Everyone holds some idea of space, some, seemingly simple understanding, while some others are highly complicated scientific and philosophic theories of space. Based on the shape, size, state, age and position of earth alone, many ideas were formed at different times. Most of it was coloured with religious faith often discarding reason and logic. Of many discussions and debates on space, the seventeenth century controversial debate between Isaac Newton (1643-1727) and Gottfried Leibniz (1646-1716) with their opposing visions perhaps paved the way for many future theories and many discoveries. For Newton space is absolute:

> Absolute space, in its own nature, without regard to anything external, remains always similar and immovable and absolute motion is the translation of a body from one absolute place into another. (408)

 Relative space, according to Newton, is some movable dimension or measure of the 'absolute spaces' which the senses determine by its position to bodies and 'place' is a part of 'space' which a body takes up, and is according to the space, either absolute or relative. Newton's argument of space as an infinitely large container for all objects/bodies, and that the container exists with or without the objects/bodies, though met with severe criticism, and

was rejected and contradicted too often seem to have perhaps forced humanity to halt and think of space.

Leibniz opposed to Newton, thought instead that space was a collection of relations between objects, given by their distance and direction from one another. According to Leibniz rather than being an entity that independently existed over and above other matter, space is no more than the collection of spatial relations (spatial properties of a place where, or the way in which something is situated) between objects in the world. Leibniz argued that space could not exist independently of objects in the world because that implies a difference between two universes exactly alike except for the location of the material world in each universe (Vailati 115).

Immanuel Kant (1724-1804) though first endorsed both the views of Newton and Leibniz, later rejected the view that space must be either a substance (absolute and independent) or a relation (spatial relation or situation of objects). Kant proposed space to be a mental construct, not an objective reality or an external relationship between objects, but a universal condition that works as a crucial tool to arrange and assimilate the information obtained subjectively by the sensory organs.

> Space is not an empirical concept which has been derived from outer experiences. … It is the subjective condition of sensibility, under which alone outer intuition is possible for us (B/38, B/42).

John Lucas explains that Kant came to the conclusion that space is not empirically discovered by humans to be objective feature of the world, but is part of an 'unavoidable systematic framework for organizing our experiences' (149). That is exactly what Kant seems to have presented in his comprehensive view on space. According to Kant spatial understanding is possible only if the mind already has space in it. Kant concludes his concept of space with the observation that, 'We can attribute spatial properties to things only to the extent that they appear to us, i.e. are objects of our sensibility... If we abstract from these appearing objects,

what remains is a pure intuition' which we call 'space', and for him space is a necessary *a priori* representation which underlies all other intuitions (B/42).

Kant's theories of space seem to have generated a lot of discussion, the larger part of it though were objections to his ideas, as Gary Hatfield points out, 'Although the 'Transcendental Aesthetics' is the briefest part of the first critique, it has garnered a lion's share of discussions' (61). Kant's theory of space seems to have been discussed ever since its publication, through the nineteenth century after the discovery of Non-Euclidian Geometry. Kant says that 'Geometry is a science that discovers what the properties of space are' (B/41). Pinhas Ben-Zvi is of the opinion that 'When Kant refers to geometry, he must mean Euclidean geometry, since non-Euclidean geometry, the brainchild of the 19th Century was unknown to him ... Space, in Euclidean Geometry, is a concept which is independent of the attributes of our human minds and senses.'[6] Thus Kant is criticised for contradicting himself by combining his spatial theory and geometry.

Gary Hatfield presents various instances and trends that questioned Kant's theory, for example, German metaphysics represented by J. F. Herbert and R. H. Lotze. Herbert's view that the capacity for spatial representation arises from experience questioned Kant's theory of space as *a priori* form[7] (86-87). Kant's idea of the impossibility of a non being of the space as, 'we can never represent to ourselves the absence of space', (B/38-39) has also been refuted many times with the possibility of the existence of a non-being.[8] Thus I would like to think that as theories were formed, they were discussed, opposed or accepted without any conclusion, for a new theory or a better invention or technology always modified or altered

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[6]Pinhas Ben-Zvi. 'Kant on Space', in *Philosophy Now: A Magazine of Ideas*.<https://philosophynow.org/issues/49/Kant_on_Space>
[7]A priori knowledge is the knowledge that is independent of all particular experiences, as opposed to a posteriori knowledge, which derives from experience. The Latin phrases a priori (from what is before) and a posteriori (from what is after) were used in philosophy originally to distinguish between arguments from causes and arguments from effects. <https://www.britannica.com/topic/a-priori-knowledge>
[8]Pythagoras and Plato held this view point of the possibility of existence of the non-being.

the previous views. The theories of the past but seem to inspire the thinkers of the future who draw insights from the earlier views as base for new ideas and project new theories and also to modify and improve the older views often with the assistance of improved technology and scientific knowledge.

Space: Michel de Certeau and Henri Lefebvre

'Space' and 'place' seem to be two geographical terms used commonly as simple expressions of relation and location, though in reality they are fairly complex. Michel de Certeau differentiates place and space in his practice of everyday life as:

> A place is the order (of whatever kind) in accord with which elements are distributed in relationships of coexistence. It thus excludes the possibility of two things being in the same location. (117)

I suppose one can consider a city or a town with all its architectural structures including the houses, offices, roads, streets, walls, gardens, etc. as an example of a place. A place has its attributes like a name, a location, and coordinates. Space as defined by Certeau is a 'practiced place' (117). I think this means the city becomes space only when human beings enter into it and walk through the streets going about their practices of daily life. According to Certeau, space is an effect, produced by operations; through operations like walking or travelling one may make space for oneself within a general place and this space may enable the body to resist the power of the state. Certeau further clarifies, 'in relation with place, space is the word when it is spoken, that is when it is caught in the ambiguity of an actualization', 'as an act of reading is the space produced by the practice of a particular place: a written text'(117).

 The opposition between 'space' and 'place' as Certeau explains is with reference to two sorts of determination. Objects that are determined to reducibility of death are places, for example a tomb or a tomb stone. If determination through practises like a movement or association with history attributed to an object like a stone, a tree or a person, it refers to 'spaces'. Stories

transform places to spaces and spaces to places like putting into place (tomb) a hero who transgresses and is guilty of some offence or a dead object when elevated for some role in the environment to stability, though motionless transforms the place into space and the terms space and place get interchanged. A church, or a school as attributed to worship of God and as temple of knowledge, I believe, should be spaces.

With the above notion in mind I would like to consider the possibility of the train as a place. A train may be considered as a place with its compartments on wheels, its metal body, arrangements of cushioned seats, etc. I think according to Certeau's theory, it becomes a travelling space when the passenger pays a price for some space in the rational place of order submitting to or resisting the regulatory power of the railways. Thus the existence of space depends upon the movements and relation of the body with time, speed, direction, etc. or the determinations attributed.

The pedestrians walking in the street create space for stories of their everyday life which they keep on scripting. Stories may be about people living and walking in the space or about those who are dead and placed in tombs. These stories require the help of 'tours' which talk of spaces or 'maps' that tell about places. Every story contains such a space in which the locations of streets, places and houses existed where the characters lived and died. As the human subject walks, he/she creates space and walks through that space for a fleeting moment physically and mentally. Once a person leaves, that space appears to be expended till another person enters and recreates the space. The binary oppositions which Certeau presents like 'strategies'(35) (power structures/place) and 'tactics' (37) (individual's response/space), 'power'(strategic power of the state) and 'resistance'(individual's choice), 'place'(the written text of the story) and 'space'(the spoken word or the reading of the text) (117) and 'city' (the

architectural planning) and 'street'(the pedestrian's space) represent the common people in the street and the authority of the central power in the city space.

> A *space* exists when one takes into consideration vectors of direction, velocities, and time variables. Thus space is composed of intersections of mobile elements. It is in a sense actuated by the ensemble of movements deployed within it. (117)

Space here is being defined by aspects of existence of people, relationships, movements and activities of human beings. Certeau argues that 'space is the practised place' (117) practice of everyday life like walking, and space is composed by 'an intersection of moving bodies' (118) and by the duration of time or the experience of speed. Hence in the urban spatiality, it is neither the state, nor the strategically planned space of the urban architecture (of streets, offices, buildings, etc.) that creates the city space, but it is what happens when ordinary people go from one place to another. That is how Certeau describes space as a 'practised place', where the working class and ordinary people move about their affairs of everyday. Urban space, architectural planning and state power are seen in space. The human subject has to negotiate this everyday with tactics which seem to be the position of Certeau considering space.

Certeau's concept of the production of space considers street culture (pedestrians walking in the street, etc.) related to the movements and occupation of the human body in the city seems to have been inherited from Henry Lefebvre as the analysis of production of space by Lefebvre clearly states that "(social) space is a (social) product"[9] (27). Certeau had been influenced by the thoughts of Lefebvre as to his view that 'every society—and hence every mode of production with all its sub variants . . . produces a space, its own space' (40). Space thus does not exist by itself, but it is produced. Lefebvre emphasizes the importance of organization in the production of space. He stresses the importance of noticing organization

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[9] The social space as a social product is not a commodity in the sense of a kilogram of sugar or a yard of cloth. It is abstract as well as real. It is a product as well as a means of production (27, 35).

in 'working space' as well as 'private space' and in the life of people in his notion of everyday life. He also draws attention to production of space under particular systems or political organizations such as feudalism, capitalism, socialism, communism, etc. He insists that there is the task of understanding space and how it is socially constructed and used and it is especially necessary given the increased importance of space in the modern age where wars are waged for domination of space and political economy restructured according to the restructuring of the spatial order.

Social space according to Lefebvre implies a great diversity of knowledge and the form of social space is 'encounter', 'assembly', and 'simultaneity' of everything that there is in space, everything that is produced and consumed. Lefebvre critically examines the modern world through his analysis first: how space is produced and second: how it is experienced. According to him space is produced as a social formation (mode of production), and as a mental construction (conception). He gives us 'the perceived–conceived–lived triad (in spatial term: spatial practice, representations of space, and representational spaces)' (Lefebvre 48) as he has viewed space in three ways, as 'perceived', 'conceived' and 'lived'. These representations by Lefebvre are in turn 'physical', 'mental' and 'social' space: The first—perceived, takes space as physical form, real space, space that is generated and used. The second—conceived, is the space of knowledge and logic, of maps, mathematics, of space as the instrumental space of social engineers and urban planners, that is, space as a mental construct. The third—lived, considers space as produced and modified over time and through its use, spaces as lived through its associated images and symbols, space as real and imagined. It is, according to Lefebvre the space of the 'inhabitants' and 'users' is also the space of artists, writers and philosophers thus making it a shared space.

David Harvey has analysed Lefebvre's triad further and has grouped and classified different spaces according to the three dimensions of Lefebvre as experienced, perceived and imagined. He has represented them in a grid of spatial practises (Harvey 220-2201) in order to capture some of the complexity as he explains it, with examples of spaces under each head in the grid. Under the head of appropriation and use of space or experience; he has included land uses and built environments, social spaces, social networks of communication and mutual aid. He has included 'personal space', 'mental maps of occupied space', 'spatial hierarchies', 'symbolic representation of spaces' and 'spatial discourses ·under the head representations of space or perception, and familiarity; hearth and home, open places, streets, squares, markets, iconography, graffiti and advertising (221) within the spaces of representation or imagination. He associates unfamiliarity with domination and control of space with examples like 'spaces of fear, monumentality, spaces of rituals, etc.' Harvey uses this grid and classification to encourage a deeper discussion of the shifting experiences of space as there seems to be no universal spatial language independent of social practices.

Lefebvre argues that space produced as a social product also serves as a tool of thought and action; that in addition to being a means of production it is also a means of control, and hence of domination, of power' (26). Space produced is a tool of thought as thoughts need language, senses, mouths, and ears, medium of air or signs as space of speech or text as written out thought. Political control and domination is exercised through spatial distribution and discipline. For example, the concept of citizenship includes in it a spatial limitation within which the political person is enclosed. Social relationships are thought of spatially and domination and power of sovereignty, state or any other authority is exercised through the control of the space. Space is a means of production even in case of a commodity as a commodity produced like a kilogram of sugar, etc. needs to consider the spaces involved in

its production in order to establish its material existence in reality. In Lefebvre's words the objects produced thus create a network of exchange in space:

> As for the commodity in general, it is obvious that kilograms of sugar, sacks of coffee beans and metres of fabric cannot do duty as the material underpinning of its existence. The stores and warehouses where these things are kept, where they wait, the ships, trains and trucks that transport them— and hence the routes used—have also to be taken into account. Furthermore, having considered all these objects individually, one still has not properly apprehended the material underpinning of the world of commodities. (Lefebvre 404)

Lefebvre's political opinions seem to have been expressed in his writings as his reaction to destruction of nature, artificial modes of production that produces everything in excess of one's needs, and the uneven distribution of space under the increasingly hideous power politics of capitalism in which the poor working class is deprived of its fair share of space.

Maps—The Physical Representation of Space

While theories of space discuss the notion, it is important to note that human beings tend to represent physically what they perceive. Space thus physically represented is called a map which is defined in the Oxford Dictionary[10] as a 'flat representation of earth's surface or of sky'. According to Dan Sullivan 'A map is a small-scale, flat-surface representation of some portion of the surface of the earth'.[11] The purpose of a map according to C. R. Crone 'is to express graphically the relations of points and features on the earth's surface to each other' (xi). I think that perhaps, what the clock making technology had been to time map making was to space, and mapping of the space or geographical locations too was as tedious a job as that of clock making. Maps too have a long history of evolution that includes ancient maps of Mesopotamia, Babylonia, ancient Greece and China. According to time period there are Medieval Maps, Renaissance Maps, Modern Maps and according to subject: political maps, linguistic maps, radio maps, etc. The latest perhaps the Global Positioning System or GPS

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[10] *The Little Oxford Dictionary of Current English.* Sixth Edition. Edit. Julia Swannell.1980.
[11] Dan Sullivan. 'Map Making and its History'.
<https://www.math.rutgers.edu/~cherlin/History/Papers2000/sullivan.html>

which is a virtual map locating real positions on the ground. Maps represent the vastness of space on a miniature canvas and assist in perceiving this expansiveness in proportion to scale thus assimilating the scales employed in its representation.

Maps in the early stages depicted small regions of a supposedly flat earth considered as the centre surrounded by water. To the Babylonians, Babylon was the centre just as Jerusalem was the centre of the medieval maps and China was the centre of the Chinese maps. David S. Landes gives an example of how the Chinese resented the European maps in which China was perceived to be a very small place (46) because the Chinese considered China to be the centre of the world. The notion of space that prevailed during a particular time is perhaps displayed in the maps of the period concerned and hence C.R Crone's observation seems to be right that: 'maps constitute an invaluable record for the students of man's past' (xiv). From this perhaps it is apt to think that the maps of a particular space and time may reveal the spatial knowledge and awareness and the technological advances of the place at that time. But Crone himself warns us that history of map making is neither continuous nor consecutive as geographical knowledge was at a standstill for many centuries when previous maps were copied (25). Hence he advises that maps must never be accepted uncritically as evidence of contemporary knowledge and technique (xiii). But I think when a new technology is used or a new location is discovered and added to a map it may be noticeable and distinguishable from the earlier versions.

In the history of map making one name that stands out is Claudius Ptolemy of Alexandria who lived perhaps during the second century A.C.E. His 'Geographical exposition' contains instructions to draw maps and tables of geographical co-ordinates comprising around 8000 localities, collected from study of itineraries, sailing directions and topographical descriptions

of many countries. According to Crone, in spite of the many discrepancies and short comings in his maps, Ptolemy seems to have influenced the world of cartography for centuries.

Michel de Certeau feels that the early maps were 'itineraries for pilgrimages, with stops one were to make and places to visit', with distances calculated in terms of time it would take to cover on foot. They contained outlines marked with footprints with regular breaks and all the events that took place like meals, battles, crossing of rivers and mountains. He calls them not geographical maps but history books (Certeau 119-120). Most of the ancient maps like Egyptian, Greek, Assyrian, Babylonian, etc. as pointed out by G.R. Crone are such itineraries drawn on a flat earth that seem to be narratives with figures and events. I think, this perhaps indicates that map making during those days had no assistance of advanced technology and they were made mainly for the purpose of pilgrimage. As sciences and technology advanced, map making improved with the use of mathematics; especially trigonometry, magnetic compasses, concepts of latitudes and meridians, and modern tools of exploration and measuring of land. Printing technology helped map making too, enabling easy printing and mass production of maps.

Inputs for map making were obtained from the observations of those who undertook voyages which were represented 'objectively' in early maps. Maps made during the fourteenth to the seventeenth century saw some of the images in the itinerary being discarded, though pictorial figuration still seemed to exist. When the earth began to be conceived as spherical, the problem representing the spherical on a flat surface arose but as Harvey points out that, the renaissance maps took on new quality of objectivity in spatial representation 'as mathematical principles could be applied, as in optics to the whole problem of representing the globe on a flat surface' (246). Modern maps, from the seventeenth century onwards got disassociated with the pictures, figures and stories. I think that perhaps the quality of the

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maps changed as they began to envelope global space with advanced technology. The purpose for which they were made perhaps changed with regard to the end user, from pilgrimage to conquest of unknown territory. After the technology of photography and satellite mapping arrived the idea of maps and map making have changed altogether. It seems perhaps that the earth is fully represented in the modern maps with clearly marked ownership, leaving no more scope for further spatial explorations on it.

Being the representation of unknown territories, maps gained great importance as David Harvey points out that 'geographical knowledge became a valued commodity in a society that was becoming more and more profit conscious' in the Western world during Renaissance. 'The accumulation of wealth, power, and capital became linked to personalised knowledge and individual command over space' (Harvey 244). Knowledge of space through the availability of a good map must have in all probability assisted in the trade with faraway places and the colonizing process. Thus it seems logical to conclude that the one who got such knowledge must always have been in an advantageous position.

The concept of 'political geography'[12] perhaps got strengthened with the awareness of space provided through maps. Political geography according to Amanda Briney is a branch of geography that studies the spatial distribution of political processes and how these processes are impacted by one's geographic location.[13] It perhaps deals with the intersection of key geographical concerns of space, place, and territory on the one hand and issues of politics, power, and policy on the other.

Maps not only furnished spatial awareness and knowledge, but also facilitated various other activities. Harvey argues that they provided accuracy in voyages, assisted in determination of

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[12] The German geographer Friedrich Ratzel has been recognized to include political geography in the title of his book – *Politische geographi*e, published in 1897.
[13] Amanda Briney. ' Political Geography'.<http://geography.about.com/od/geographyintern/a/amandabio.htm> Retrieved on10th July2016.

territorial boundaries, domains of administration and social control, in fixing property rights of lands, means of passage, and in transportation (249). Thus maps provided a sense of finitude to the human race with the known and given spatial awareness of the globe, within infinite space.

Maps perhaps played a very important role in the competition between countries in exploring, colonizing, and accumulating wealth from remote places either conquered or colonized. And in the meantime a reliable map itself was money, fetching a decent sum from those who demanded it. David S. Landes explains in the context of the Indies: 'In the international contest for access to the riches of the Indies, maps were money, and secret agents of aspiring powers paid gold for copies of the carefully guarded Portuguese *pardons*'(110).

In spite of the advancements in map making techniques and modern maps, it seems that accurate representation of the Earth's position is not possible. M. F. Goddchild argues that all the mapping instruments are prone to error and the frame as defined by the earth's axis moves as the earth vibrates, and along with it the Poles and the Equator; and the mathematical functions used to approximate the shape of the Earth are defined only to limited precision. As the age of exploration seems to be over and the political ownership more or less a settled matter, the modern maps portray, clearly marked territories and their boundaries.

Territories and Boundaries

Territory seems to be a concept associated with geography and more precisely political geography. It may be geographical as it is a portion of the Earth's surface delimited by certain boundaries, at certain places which may be natural like rivers, mountains, deserts, etc, or imaginary ones constructed for a purpose or a fiction. It is political, when it is defended by a political power whose control exerts its jurisdiction upon that space. The term territory may

denote a political territory in a strict sense, but it is often used casually for lesser divisions as well as personal spaces, where access is denied to the general public and 'outsiders'. Those who defend such territories usually announce their territoriality through boards of 'no entry', 'trespassers will be prosecuted', 'restricted area', etc. David Storey calls such examples of territories 'micro-scale territoriality.'[14] A space may become a territory at any time. Colonial times saw increasing territorialisation of colonial power and de-territorialisation in the post colonial era in many cases. Marco Antonsich is of the opinion that potentially, any space can become a territory. For example a restricted room in a house for the children like a library may be a territory of parental control, or a public space like a park may become a territory when barricaded temporarily for an exhibition or political, religious or private ceremony and even for all kinds of meetings.

According to Heini Hediger, 'territory may be represented as an area which is first rendered distinctive by its owner in a particular way and, secondly, is defended by it' (9). Hediger's definition of territory is in terms of animal world as every species or race is known to have a definite geographical distribution, and as he argues: 'even in so-called freedom the animal is not free but spatially bound to its conquered territory which it marks and defends' (9). Territoriality among animals especially the lower ones is considered to be a natural instinct for survival.

Human beings also seem to be territorial though it is not a biological or natural instinct of territoriality. By human territoriality Robert D. Sack means 'the attempt to affect, influence, or control actions (of people, things, and relationships) by asserting and attempting to enforce control over a geographic area.'[15] The process of defending the territory may be referred to as

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[14] David Storey. 'Territory and Territoriality'. <http://www.oxfordbibliographies.com/view/document/obo-9780199874002/obo-9780199874002-0076.xml>

[15] Robert D. Sack. 'Human Territoriality: A Theory'. Annals of the association of American Geographers, Vol.73, No.1. (Mar., 1983) 55. <http://links.jstor.org/>.

territoriality. Among human beings it is rather a strategy of control and power than a biological urge for survival. Hence I would like to think that the world is highly territorialized and it is manifested in the political divisions like states, nations, etc. which are political entities with marked boundaries with a sovereign power controlling it.

A territory may thus imply a space with specific boundaries and certain systems unique to that space that possibly include a particular cultural practice, some kind of rules and regulations and above all an authority of power that enforces the rules. It is not a given, but a human strategy. As Foucault defines in his lecture titled 'Security, Territory, Population,' territory is a bounded up space with the power of the sovereign exercised upon the population within its boundaries.

> Baldly, at first sight and somewhat schematically, we could say that sovereignty is exercised within the borders of a territory, discipline is exercised on the bodies of individuals, and security is exercised over a whole population. Territorial borders, individual bodies, and a whole population... (25)

Thus territorial power seems to ensure security and safety of the subjects by defending the territory against outside incursion and threat from inside by ensuring discipline. However, Marco Antonsich feels that territory is a space associated with a socio-economic project, namely the pursuit of the "good life" of people, their happiness, and their well-being,[16] because it is a peopled space and it is the people living in the territory, more important than the political power that become important. I find this point important because the concept of a territory or the political power does not hold any merit unless the space is inhabited by people. Some territories though uninhabited due to extreme weather conditions may be very important if they are strategically placed in border regions, etc.

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[16] Marco Antonsich . 'Territory and territoriality', in the Association of American Geographers. *The International Encyclopedia of Geography*. Oxford: Wiley-Blackwell, 2015.

Along with defence strategies the political authority may consider it important to ensure discipline through the control of space. In *Discipline and Punish*, Foucault argues that 'discipline proceeds from the distribution of individuals in space' (141). This distribution is sometimes achieved by enclosed spaces of disciplinary monotony; 'closed in upon itself', as in the confinement of vagabonds and paupers, colleges, secondary schools of the monastic models, hospitals, the military barracks, the army, etc. The strict boundaries of all these institutions perhaps ensured isolation and distribution of the individuals within the territory and control of the governing powers that be.

Stuart Elden, in *The Birth of Territory* 'seeks to offer an account of the emergence of the concept of territory in Western political thought' (10) by tracing in detail the relations between land and power as understood by classical Greece to the development of the territorial and use of the concept resembling the modern understanding of territory, that is 'of a bounded space as the object of rule.'[17] According to Elden, the idea of a territory as a bounded space under the control of a group of people, with fixed boundaries, exclusive internal sovereignty, and equal external status contains 'a mix of political, geographical, legal, technical, practical, and relational questions' (16). All the important aspects of a territory with its bounded space, internal and external status and positions, etc., seem to have been included in Elden's definition as it has evolved into its modern specifications.

The culmination of the nomadic life style of humans perhaps ended when someone erected a fence around a stretch of land, calling it his/her own and settling down within the space s/he barricaded with separate fences within for the domesticated animals whom Jean-Jacques Rousseau calls 'the real founder of civil society.'[18] I would like to believe that perhaps this was the birth of territory—a defended space, with a boundary. One may come across

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[17]Stuart Elden. *The Birth Of Territory*. Chicago: University of Chicago Press. 2013.
[18] Jean-Jacques Rousseau. Quoted by Elden (1)

boundaries set at different levels of space as personal, local, national, international and even hear about air space and water territory. Space fundamentally is boundless as no end or a natural boundary of space is proved yet (Hawking 5) and hence the boundaries that people set and those found as in between natural boundaries like seas, mountains, etc. are perhaps just illusions of privacy and control in the eternal vastness of the universe. Human beings erect boundaries often to set the limits to countries, nations, states or to the individual property. As is common knowledge international boundaries are rigorously set and vigilantly guarded, patrolled and crossings are policed and restricted as they are the symbols of political power. Borders thus have a great role to play in territory and territoriality in political geography. Boundaries are erected and dismantled as political divisions and unifications take place.[19] Lefebvre argues that walls and boundaries are just an ambiguous continuity:

> Visible boundaries, such as walls or enclosures in general, give rise for the part to an appearance of separation between spaces where in fact what exists is an ambiguous continuity. The space of a room, bedroom, house or garden may be cut off in a sense from social space by barriers and walls, by all the signs of private property, yet still remain fundamentally part of that space. (7-8)

Hence I think boundaries exist as a mental construct in the boundless universe where diminutive humans pretend to hold the possession of space as if they own it and label it national, private, or personal.

Very often the boundaries are issues of dispute between nations or individuals. Territorial disputes often arise as challenges to marked boundaries with issues of contention and disagreements. Michael de Certeau considers disputed boundaries and describes the court clerk's writings of interlocutory judgments about the disputes concerning debatable boundaries often including drawings outlining the boundaries; as meta-stories combining together the opposing stories of the parties involved (122). A travel story by narrating where

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[19] For example- Germany, Korea and the European Union.

the story has taken place establishes space within the boundaries and distinguishes the alien space beyond the established and known boundaries.

Boundaries perhaps provide a sense of belongingness to the citizens within the territorial space of a state. This becomes thus a sort of a bounded space inside the unlimited expanse controlled by some authority. It might be considered a nationalistic space if nationalistic discourse is applied. Borders are perhaps produced by negotiations, both political and social, and they help the government and the citizens to adopt their strategies at different levels. I am of the opinion that the significance of borders keeps changing with increasing globalization, global capital, global economy, etc. towards a less rigidly bounded global space. The prominent exterior boundaries and the lesser prominent interior boundaries of the European Union may be an example of such changing territorial strategies. Global capital movement as Tabish Khair[20] explains seems to be not matching with the borders as capital and goods move rather too easily than the labour across the borders. But the capital movement is neither controlled nor highlighted as the migrant labour movement. Capital that moves seems to be virtual than real and hence illusive where as the labour moving in search of better living are visible especially if they belong to the third world countries. 'Shrinking of space' which was felt during the advent of the railways in the eighteenth century seems to recur with the notion of the global village in the present age of globalization.

Public, Private and Personal Space

Boundaries are not only erected in the physical space of political territory, but at different levels of spaces in mental and physical spheres. The concept of private space is in opposition with the concept of public space. Private space may exist at an individual, family or an

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[20] Tabish Khair. The spectre in Europe: Its simmering xenophobia stems from the inability of its politicians to manage global capital. *The Indian Express*. Published on December 10, 2016.

organizational level with clear restrictions for those who may be treated as outsiders. This distinction at times is difficult to maintain as the space may be private and public at the same time. The difference in these two spaces categorises certain activities that may be allowed or restricted according to the nature of the space and practices of the culture. Human beings maintain a certain space around them with relation to other people which varies according to intimacy, relation, familiarity, cultural norms, gender differences, etc. and also in relation to all these categories in different times. This may be called personal space as it is at the individual level. It may not be a measured space of distance but produced by intuition as one may keep more distance from a stranger belonging to a different sex or a lesser space with a close acquaintance (Hall 120, 21). Heini Hediger has applied the terms—personal distance, flight distance,[21] critical distance,[22] individual distance, etc. as defence mechanisms of behaviour in animals and to the spacing that non-contact animals[23] maintain between themselves and their fellows (19-20). Edward T. Hall considers that this distance acts as an invisible bubble that surrounds the organism maintaining distance between itself and others (10). I think if one observes people in a public place, one may perhaps get the feeling of such bubbles of varied radius around every human being. Hall thinks that the size of the sphere surrounding the person varies with the degree of crowding, age, sex, and the importance of the person, as well as the general surroundings. It may perhaps be observed that among closer relations, bubbles may be smaller, and bigger bubbles may be observed among strangers. Hall has coined a term—*Proxemics* (1) to describe the study of how people perceive the proximity of others. He used the term for interrelated observations and theories of man's use of space as a specialized elaboration of culture.

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[21] An antelope will flee when the intruder is as much as five hundred yards away (Hall 11).

[22] A lion in a zoo will flee from an approaching man until it meets an insurmountable barrier. If the man continues the approach, he soon penetrates the lion's critical distance, at which point the cornered lion reverses direction and begins slowly to stalk the man (Ibid,.12.)

[23] Animals that keep individual distance and do not tolerate physical contact. Also known as distance animals

This notion of personal space seems to be culture specific. Hall points out that while the English, the Americans, the French, and the Germans for example, are invariably concerned about preserving their personal space, pushing and shoving is very common in the Arab world. According to me this difference may be due to differences in perception of personal space as well as due to the scarcity of space to maintain adequate personal distance in a limited public space with more individuals than can be adjusted. According to Hall, Arabs do not understand the insistence of personal space in a public space for public space is just public place for them. I think it is the same reason perhaps in India too that people resort to push and shove in public places competing for the limited space available. The trains and railway stations in colonial India witnessed this diversity too often among the British who cherished the sanctity of personal space (lesser in number with more space allotted) and the multitude of Indians pushing and crowding in limited space.

Personal space thus may be a delimited space that surrounds the person which determines the distance maintained among the physical bodies. People allow breaking this distance for intimacy while lack of familiarity and hostility keep it in tact (Hall illustration 47). Henry Lefebvre considers that, 'each living body is space and has its space: It produces itself in space and it produces that space' (170). The space of the being and the space that it creates to occupy seems to extend a little more to keep a distance 'at an arm's length' as the saying goes. The body which itself is a space produces a space it occupies as its personal space. In highly populated places this space is lesser than the scarcely populated regions. The personal space I talked about so far is what maintained by a body in a public space.

Personal space may also include the space of personal or private property such as a house, a kitchen, a bedroom, etc. A home is the most celebrated personal space, as Gaston Bachelard reasons: 'For our house is our corner of the world. As has often been said, it is our first

universe, a real cosmos in every sense of the word' (4). Home is the first personal space where a child may feel belonging as it is its first world after coming into the world. People are usually particular about their private space and they may be opened only for intimate relations like close friends, spouses, children or parents at certain points of time. The term home though commonly evokes the image of a building in which one lives, it may have different meanings for different people at different times and they may think differently about different rooms in the house. The words house and home denotes the same physical space, though it is distinguished as house implying the 'building for habitation' and home 'a place where one lives.'[24] Cultural differences of people may have influence on how they perceive and live this space and behave according to their understanding of certain spatial vocabulary like 'inside' 'outside', etc. Hall has compared the Germans, the Americans, the English, the Arabs and many other cultures in this context to bring forth some of the common differences in considering whether a person is inside, outside, intruding or not (131-162).

Intrusion into the personal space like a house is a violation in a culture which values the privacy of its individuals. Bachelard's home as a space for day dreaming may not be so dreamy and conducive as the personal space of home which is largely intruded into by media like television, internet and smart phones. In contemporary times personal space also includes the virtual space where one can restrict the rights of others into the personal data and opinions. Private virtual spaces are where a person keeps information which is strictly out of reach for others like cloud memory, storage, etc. or a space shared only with certain people like private virtual chat space. Personal space may contain personal information which others may view, but should not alter or tamper with. It is often seen that intruders try to hack this space and violate the sanctity of this space by pilfering personal and private information and

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[24] The Little Oxford Dictionary of Current English. Sixth Edition. Edit. Julia Swannell.1980. 257, 261.

misusing it though one guards this space zealously with passwords and encryption technology.

Space: Interior/Exterior

Two major contrasting concepts of space, one quite commonly encountered is the inside and outside or the interior and exterior. Exterior may be the appearance and interior not the reality but another appearance. F. H. Bradley points out that: 'the world, as so understood, contradicts itself; and is therefore appearance, and not reality' (17). This concept of interior-exterior space like appearance and reality seem to be human experience symbolizing a container-contained-boundary relationship where the interior appears separated and protected from the outside by a boundary. The human body as commonly understood is a combination of interior and exterior space of the being. Everyone seems to be aware of the body that includes the physical and mental space and also the physical body's duality of the anatomical atlas of interiority and the exterior form. Bradley holds the opinion that the body and the soul have no reality in them but are appearances. 'For body and soul are mere appearances, distinctions set up and held apart in the Whole' (197), and 'Souls, like their bodies, are, as such, nothing more than appearance (203). Concepts of interior and exterior are also thus relative terms of appearances in the world of appearances.

The immediate image of interiority may be the inside of a house, a supposedly private and personal space. I call it private because a person considers a house as the dwelling place for the self, family or for the select few and usually it is not open for all. It is also personal as each person might have some subjective experience or close attachment to some parts of the house not shared with anyone. It is so personal and stored in the memory that the view from the room, unique smells when the old chest is opened, etc. of a childhood room may remain with a person who can relive it and feel it even after many years and gone to faraway places.

Gaston Bahcelard's opening statement of his *Poetics of Space* highlights the privileged state of the house in this context:

> The house, quite obviously, is a privileged entity for a phenomenological study of the intimate values of inside space, provided, of course, that we take it in both its unity and its complexity, and endeavours to integrate all the special values in one fundamental value. (3)

The primary value of the inside space of a house I think is the protected feeling one experiences while dwelling in it. It is supposed to be the most familiar space in a person's life and each person might have a subjective experience of the interiority of the house including some intimate, private space (Bachelard 4) and some common space shared with other members and also certain restricted areas.

The inside space of a house provides its complexities through feelings of belonging and security and memories of a past. Exterior space outside the limits of the house is open to scrutiny and observation and the dreamy memories, the notion of privacy and protection, etc. experienced inside the house end as one comes out of the threshold. Spatial experience of a favourite niche or a special seat inside the house vary in great proportion when compared with the experience of a threshold or just the exterior of the house, and hence I agree with Bachelard as he says that, 'Memories of the outside world will never have the same tonality as those of home' (6) which is like a shell to the person dwelling inside. Bachelard's space of memories inside the house is 'a cellar and a garret, nooks and corridors' (8), which are the features of the interior of a European house. But houses in different climatic and geographic conditions may differ in architectural style. Peter Skinner claims that in houses with neither 'basements nor accessible attics, the most potent spaces in the house of memory are to be found 'under the stumps' or 'on the veranda', spaces that can be claimed as both inside and

out'.[25] And in between there are some other spaces like the balcony, the foyer, the hall, the veranda, the boudoir, etc. which function as both interior and exterior, private or semi-private and often the presence of others like TVs., visitors, etc. are felt.

As the responsibility of the planning of the city space is considered to be the task of the state and the architects, organization of buildings and space for different classes in the society seem to be decided and demarcated (Lefebvre 383). Apartments (the French architect and philosopher Le Corbusier's visions evolving ways to house large numbers of people in response to the urban housing crisis), the modern houses of the masses in cities, hardly have any outer space attached to the houses. In order to cover up this shortcoming they usually try to include many windows and balconies perhaps to bridge the gap between the inside/outside notions. Space outside the apartment is public space and hence the balconies verandas, etc. are private or semi private space and interior in that sense, but they also function as outer space observed and scrutinised by the people outside and this observation and scrutiny do not contribute to violation of any sort.[26]

Distribution of space and spatial organization everywhere tends to bring in class differences as the rich claim and occupy more space while the poor get lesser and lesser. In a country like India class, caste and religion seem to divide space. Lefebvre argues that social planning results in an abundance of space for the rich and too little for the poor. This inequality is carried forward into uneven development in the quality of places. Like all economies, the political economy of space is based on the idea of scarcity (21).Victoria Thompson while

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[25]Peter Skinner. 'Reflections on Inside-Outside Space', in Newton, C. Kaji-O'Grady, S. Wollan (eds.) Design and Research; Project based research in architecture, 2nd International Conference of the Australian Association of Schools of Architecture, Melbourne, 28-30 Sept, 2003.
<http://www.arbld.unimelb.edu.au/events/conferences/aasa/papers>
[26] Victoria E. Thompson. Telling "Spatial Stories": Urban Space and Bourgeois Identity in Early Nineteenth-Century, Paris. [*The Journal of Modern History* 75 (September 2003): 523–556] 2003 by the University of Chicago. 0022-2801/2003/7503-0002.

describing the Parisian apartments that came up in the city space after the revolution points

out the peculiar blend of public-private nature of the apartment in her article as:

> Middle-class apartments were thus increasingly characterized by a continuum
> of public and private spaces that served to regulate the different aspects of
> middle-class life and to bring together, in a rational and harmonious way,
> distinctions between display and introspection, between exterior and interior,
> and between the community and the individual.[27]

This space of the balconies, verandas, etc. serve as ambiguous space which do not pertain to

the interior/exterior, inside/outside classifications as they can be included in all of these

categories of spaces. This is so because these spaces enjoy inner status being parts of a house,

but can be watched and seen by others from outside. Skinner in his research paper raises

questions about such ambiguous spaces as they are difficult to classify:

> Inside-outside ambiguity raises some interesting questions. How much enclosure
> constitutes interior space? At what point is a space rendered external? Can a stable
> perceptual balance be achieved between such seemingly exclusive notions as interiority
> and exteriority? Or is it the conceptual instability of this ambiguous condition that lends
> it aesthetic power?[28]

Since it is not easy to answer these questions and classify these spaces according to the

prevailing classes, Skinner calls them 'inside-outside space' as the architectural concerns

construct such spaces and allow people to choose between interactions with outside world

and preserving the intimacy of the inside world from these spaces.

Skinner argues that interiority/exteriority of space is an ambiguous approach to architecture,

as the inside of a house and a public stadium differs considerably though both are spatially

interior. The notion of the inside outside may give the feeling of inside as small and the

outside to be vast. Concepts of smallness and vastness are again comparisons of individual

subjectivities, intersecting perceptions or memories. Roger Penrose has tried to present in a

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[27] Ibid.

[28] Peter Skinner. 'Reflections on Inside-Outside, Space'. Design + Research; Project based research in
architecture, 2nd International Conference of the Australasian Association of Schools of Architecture,
Melbourne, 28-30 Sept 2003.<http://www.arbld.unimelb.edu.au/events/conferences/aasa/papers>

schematic diagram with time scales and the corresponding distance scales and has found that human beings come just in the middle if the micro organism is small, and the universe is big. Penrose concludes that: 'As far as spatial sizes are concerned, we are very much in the middle; we directly experience neither the physics of the very large nor the very small. We are very much in between', (6-7) as being in between it may be convenient for the human being to assess and compare the smallness and vastness of space. Concepts of big and small are also in the human mind; hence subjective and illusory. It is an illusion as growing distance makes objects look deceptively small. A human being on earth viewed from outer space may appear no bigger than a dot or a micro-organism and as Bachelard points out, 'Everything, even size, is a human value … that miniature can accumulate size. It is vast in its way' (215). The Earth which appears to be vast is just a speck in the vastness of the universe.

I would like to consider 'interior', 'exterior',' inside' and 'outside' as concepts to understand space and see if they can be found in railway territory, i.e. a railway station. A pathway leads to the outer side of the station which is still exterior as there are no conditions set for people to enter this space. Crossing into the inner space, the platform is restricted as only the ticket holding passengers are permitted to enter this space. Interior to this inner space there are waiting rooms, and also the interior of the trains. The bounded interior space may be limited and difficult to expand; the space exterior is unlimited as can be further expanded.

Expansion of Space

Aristotle in 340 B.C.E. and Ptolemy in the second century A.C.E. believed the Earth to be the centre of the universe, static, circular and flat with the sun revolving around it. The Church too endorsed this view and it prevailed till 1514 A.C.E. when Nicholas Copernicus suggested that the sun was at the centre and stationary with earth and other planets moving around the

sun. But it was only in 1609 that this theory was taken seriously after Johannes Kepler and Galileo Galilei supported the view of Copernicus[29] and in 1687 when Sir Isaac Newton confirmed the theory (Hawking1-3). Discovery of the presence of many more galaxies in the universe just like the one in which the earth is situated proved that it is only one among many. This discovery perhaps raised more questions about the size of the universe; its state and finitude as the universe seem to expand infinitely.

Stephen Hawking presents a view of the expanding universe as it is proved to be expanding as galaxies are drifting away from our galaxy. This phenomenon is detected by observing the different wavelength of light from the stars that the human eyes see as different colours, 'with the longest wavelengths appearing at the red end of the spectrum and the shortest wavelengths at the blue end'. Observing this colour difference it can be decided if a star is coming closer to us or moving away from us. 'In the case of light, therefore, means that stars moving away from us will have their spectra shifted toward the red end of the spectrum (red-shifted) and those moving toward us will have their spectra blue-shifted. According to Hawkins this relationship between wavelength and speed, which is called the Doppler Effect,[30] is an everyday experience. It is an everyday experience as people experience numerous vehicles approaching them and moving away with sirens or other sounds creating the Doppler Effect. It is also observed that galaxy's red shift is not random, but proportional to the distance from Earth and that most of the galaxies appear red shifted. This indicates that galaxies are drifting away from our galaxy. If it is proved that all other galaxies are drifting away from ours and not one another, the view of the Earth as the centre may come true again. The expansion theory also points towards the possibilities of the collapse of the universe or

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[29] Galileo was put under house arrest for life and torture and commanded to publically denounce Copernicanism by the Church (Hawking 96).

[30] The Doppler Effect or Doppler shift, named after Austrian physicist Christian Doppler who proposed it in 1842, 'is the change in frequency of a wave for an observer moving relative to the source of the wave'. Florian Ion Petrescu. *A New Doppler Effect* (Norderstedt: Books on Demand GmbH) 2012, 1.

contraction at some point of time taking it back to a condition it was in like it was prior to the Big Bang, though it may not occur for some millions and millions of years (25). Hence it may not be possible to prove whether the Earth is the centre of the Universe or a big collapse will bring about its end.

Railway technology is supposed to have created an impression of shrinking of space through its increased speed of travel. Another effect was that it was widening the space by enabling access to more remote places and connecting them. These were human reactions to novel experiences and mental perceptions in a universe which is perhaps infinite and growing still, but highly partitioned, bounded and labelled by human beings.

Partitioning and Labelling of Space

Space is partitioned over and again and labelled politically, geographically and socially. Partitioning when it naturally occurs due to rivers or mountains may be considered as geometric aspects of space. But Lefebvre and Certeau along with many others have insisted on considering different dimensions of space and not only geometry, like its lived practices and significances. Here space is to be considered as a social construct that represents social relations and material practices of everyday life.

 The material space was partitioned into kingdoms in the early days when kings and dynasties fought for the supremacy of space. Now as the monarchies and dynasties are extinct, the politics of a post globalized world defend, fight over, and invade other's territories. The planet is partitioned into continents, countries, cities, towns, villages and into pieces of land, etc. The basis of partition may be natural geographic barriers like seas, mountains or deserts as we can find in a map, or on basis of clustering of homogenous races of inhabitants, or of common religious faith. Political partition of a whole into parts occurred at the time of the

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dismantling of the Empire by drawing a line through the map and cutting it across to divide and label the political entities differently. What is simple on a map is a traumatic experience for dislocated people, especially for those who fall on the wrong side of the line due to linguistic or religious affiliations. History has witnessed many such partitions, bloodshed, unification and the accompanying problems including an identity crisis. Even the outer space (what is beyond the Earth) seems to have been partitioned into spheres that have been labelled by human beings, as have stars and planets which the human race has not yet visited.

Hallowed Space/ Unhallowed Space

Religions categorize space as hallowed and unhallowed. I think the most basic notion of the hallowed, spatiality imagined is Heaven and the unhallowed, Hell. Most religions believe the whole world and the universe to be the creation of God. This presupposes the holiness of the whole Universe as divine creation. Yet only some places are deemed holy or hallowed spaces. Architectural structures of temples, mosques, cathedrals, churches and shrines, etc. are considered to be hallowed spaces. Every religion has its holy places where certain events may have taken place, divine beings dwelt in or are believed to have dwelt in, or the divine presence felt still or imagined (Jones 38). Elaborate dedication ceremonies, conducted in a church or *shuddhikaran* rituals in a temple are supposed to have cleansed it and made it holy. Furthermore, the prominence of the landscape where the holy structures are erected and their architectural differences emphasize the sanctity of the space.

Certain hallowed territories are still protected to sustain holiness through restrictions. For example women of certain age are forbidden from many holy places and shrines as advocated by the patriarchal guardians as it is necessary to maintain the sanctity and purity of the places. Sabarimala in Kerala is one such holy place where women are still fighting for an entry.

Caste and gender create territorial boundaries in India to exclude and to include; a deep rooted issue in the society.

Pilgrimages to important holy places existed in every land perhaps since religion took place, and this in turn developed a commercial space surrounding such holy places to provide the necessities of the pilgrims. Thus almost all the hallowed spaces of pilgrimage centres coexist with the unhallowed merchant spaces of sellers of artefacts narrowing the boundaries of religious and commercial spaces. Saint Augustine compares two cities, one hallowed and the other unholy, 'Jerusalem which is above, our eternal mother in heaven City of God' (Augustine B.16, Ch.10) whereas the city of the godless Babylon which meant confusion or, impious city of the devil (ch-31,471). According to Lefebvre, 'absolute (religious and political) space is made up of sacred or cursed locations: temples, palaces commemorative or funerary monuments, places of privileges or distinguished in one way or another' (240). Such privileged spaces and everything that is associated with them become land marks of culture and civilization of the land in which they are made up.

Every culture has designated certain spaces as hallowed and certain other spaces as unhallowed. In India most of the mountains and rivers are linked to the divine in mythological texts as abodes of Gods and Goddesses or related in some contexts and hence centres of pilgrimage. Certain rivers and mountains are considered as Goddesses and Gods, and worshipped, like the river Ganga. Cemeteries, funeral places, etc. are uncanny spaces in all the cultures though tombs or burial places of saints and holy ones are considered as hallowed spaces with devotees and pilgrims making regular visits for prayers and worship especially in religions like Christianity and Islam. Final resting places of the national heroes and political leaders also are sometimes treated like pilgrimage centres. People who committed suicide or suspected of it were not allowed to be buried in the hallowed part of the

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cemetery in Christianity. Such people were buried somewhere outside the cemetery. Thus people were even divided in allocated spaces after death.

Gendered Space: Male Space /Female Space

In most parts of the World men enjoyed almost complete authority and power in both public and private spheres as patriarchy gendered the space ensuring all male culture and projected masculine space and marginalized female space. All male culture is evident in languages as the word 'mankind' denotes human beings. Aristotle says, 'Man' is a political animal (Book1 Part II). Since nothing specifically is said about women one may assume that 'man' is meant for all human beings. In many places in *The Bible* 'man' is used generally for all the people. "The scripture says, 'Man cannot live on bread alone'..." (Mathew4:4). Most public places are for men as they have rights to use at any time. However the same space is open for women only at certain times. Street corners and junctions where boys and men hang around are such spaces where women are not allowed especially at night. Lefebvre observes that 'paternities imposition of its juridical law (the law) on maternity promoted abstraction to the rank of a law and thought. Abstraction was introduced and presupposed—by the father's dominion over the soil, over possessions, over children, over servants and slaves and over women' (243). Space was always gendered with female space linked to the reproduction of the species and male space dominating the family with the womenfolk reduced to the kitchen space.

Women had strictly no entry into the public spaces of males such as bars, gilds and clubs and men zealously guarded these places against women's intrusion. Prem Chowdhary cites examples of private as well as public places, like sitting areas in the houses, village *khaps* (a sort of self-governing unit) certain areas in the market place, protected from female presence where their presence is met with ridicule and violence. According to Chowdhary

masculinisation of space goes totally unacknowledged and unchallenged and has not merited any comment, discussion or condemnation (41-42). I think acknowledgement, comment or discussion of male authority and privileges are unwarranted and goes unchallenged and without any condemnation because it is a patriarchal world. Any demand from women for their space seems to be opposed and exaggerated disproportionately.

Industrialization, with its new work culture and division of labour saw men and women in large numbers going out to industries for work at times sharing the work space, though previously women stayed at home cooking, looking after the children and taking care of the family. As women began getting into industries they also demanded social, political and historical space and for equal status and space in work and society. Julia Kristeva feels that the feminist revolution though evolved out of industrial revolution was in ways more effective as women demanded their space and asserted their position in the society. 'The political demands of women; the struggles for equal pay for equal work, for taking power in social institutions on an equal footing with men; the rejection, when necessary, of the attributes traditionally considered feminine or maternal in so far as they are deemed incompatible with insertion in that history,'(193-194) saw great movements with rippling effect world over. Women who could not venture out unattended by men and who had no voice even in matters concerning personal, family or social life, began to seek a space in the social production and reproduction of the political state. The success story of the Women's Suffrage Movement scripted the narrative of unrolling of the political and social space for women. Most of the male bastions began opening up for women including bars and military organizations. Home as well as work spaces have seen the demolition of barricades for women and a shrinking of male only spaces. Women have also entered into another forbidden space—the space of writing, removing another obstacle of expression, creating a literature, spatializing their feelings, desires and expressions. Technology of mobility that enabled long

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distances to be covered in a short duration too seems to have played a decisive role in women's liberation as they could venture out safely unaccompanied by men and this in turn changed many cultural aspects as well. In fact it was the world war that changed the life of women as Darrell Vydelingum says: 'Suddenly the country was run by women' (Wonderland May 27th). As most of the men had gone to war women came out of their homes to work in factories ammunition manufacturing and in the railways. They discarded the restrictive corsets and skirts to comfortable and convenient clothing styles and the changes remained after the end of the wars. Though most of them went back to their previous roles after the war and there was no drastic change in their lives it seems that the wars played some decisive role in liberating women. [31]

Gendered space should include also the space for the transgendered, people with different sexual orientation like gays and lesbians though prudish cultures remain reluctant to recognize their space so as to reaffirm the conventional and conservative social formations.

Mental Space

The mutually opposing arguments of the Cartesian claim of 'mind-body dualism' in which the mind or the soul being entirely different from the body and the modern 'embodied cognition' in which the mind and the body being connected and influencing each other seem to be based on the common perception that the human being is a combination of a body occupying physical space that is the visible and tangible, and an invisible and intangible mental space. According to Robert M. Young, the world is divided into 'thinking substances'—the phenomena of mind—and 'extended substances''—the phenomena of bodies or matter, with extension, shape and dimensions' (1). This is the Cartesian 'mind-body

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[31] Joshua S. Goldstein. *War and Gender: How Gender Shapes the War System and Vice Versa*. London: Cambridge University Press, 2001.

dualism as René Descartes puts forward: 'I', that is to say, the mind by which I am what I am, is wholly distinct from the body, and is even more easily known than the latter, and is such, that although the latter were not, it would still continue to be all that it is' (75-76). The study of this particular human spatiality is known as 'psychology', as opposed to 'anatomy' and 'physiology' of the extended substance—the body. It is the inner world of the human being that may include conscious and the unconscious realms of the mind in spatial terms. It is a problematic effort to connect the mental and the physical to analyse how the mental imbalance causes at times physical disorders or physical disorders causing mental imbalance. 'Psychoanalysis', (a development of Sigmund Freud's discoveries)[32] associate, isolate and cure as in Freud's case studies of hysteria and many 'psychosomatic' disorders. Mind has in it the external world as it has to interact with transactions and business, etc. Young gives an example of a clinical study of how schizophrenics perceive and treat the external environment provides an interesting link between views of the inner world and ideas of the outer one as both worlds are highly interpretative (47).

Mental space like a container seems to hold knowledge, emotions like love, hate, fear, etc. imagination and intelligence, 'a place where one can bear experience, hold it and be able to ruminate it, metabolise it, reflect upon it, savour it' (Young 34). The space of dreams that is attributed to the unconscious realms of the mind may be treated as yet another division of mental space as psychologists and dream analysers would like to argue (Freud 35). Robert M.Young is of the opinion that it is not what the mind contains that should be studied but the possibility of a container, a mental space that should be probed. The intensity of feelings of joy or sorrow as Henry Bergson (7) argues cannot be measured and compared to be more or

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[32] Strachey, J. (1910). Five Lectures on Psycho-analysis. The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume XI (1910): Five Lectures on Psycho-Analysis, Leonardo da Vinci and Other Works, 1-56…columbia.edu:2048/document.php? i… Sigmund Freud has included in a foot- note of his lecture that he has taken responsibility of the term psycho-analysis in his work 'A History of the Psycho-Analytic Movement'.

less because they are qualitative and have no quantity and magnitude as they are not spatially extended. If psychoanalysis helps to reveal what humans think about themselves, perhaps the space, in which they try it most, is culture. Culture is yet another term supposedly simple and understood and used too freely but rather difficult to pin down in a single definition. Young finds a useful working definition of culture by Elvin Hatch:

> Culture is the way of life of a people. It consists of conventional patterns of thought and behaviour, including values, beliefs, rules of conduct, political organisation, economic activity, and the like, which are passed on from one generation to the next by learning—and not by biological inheritance. The concept of culture is an idea of signal importance, for it provides a set of principles for explaining and understanding human behaviour.[33]

Culture is thus learned while its beliefs, values, rules, etc. are expressed through language. Gilles Fauconnier argues that language builds up mental spaces, relations between them, and relations between elements within them. He feels that mental spaces are constructed and modified as people think and talk, 'to the extent that two of us build up similar space configurations from the same linguistic and pragmatic data, we may "communicate"; communication is a possible corollary of the construction process' (Fauconnier 2). This similarity is the cultural homogeneity which changes constantly. The Sapir-Whorf linguistic hypothesis that provoked many discussions based on the influence of language upon people's perceptions implies that speakers of different languages perceive the world differently. I assume that this occurs because people have no option but to think within the limits of language.

Fauconnier introduces the theoretical notion of mental spaces, as 'constructs distinct from linguistic structures but built up in any discourse according to guidelines provided by the linguistic expressions' (16). It is the construction of mental spaces and organization of mappings between those mental spaces that enable the construction of meaning. Robert

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[33]Elvin Hatch. *The Social Science Encyclopedia.*Edit. Adam Kuper and Jessica Kuper. Routledge, 2004. Routledge Politics and International Relations Online, Taylor & Francis.05 August 2015. <http://www.routledgeonline.com:80/politics/Book.aspx>

M.Young treats mental space as 'available for containment, a place where one can bear experience, hold it and be able to ruminate on it, metabolise it, reflect upon it, savour it'(34). These are the mental processes of thinking and use of memory, perhaps the internal store house of information. Mental space is seemingly expressed through linguistic articulations and behavioural patterns, similar yet different with individual subjectivity. Such differences to a greater magnitude may be found in schizophrenic, mentally retarded, socially marginalised, very old people, and young children.

Invasion of Space/ Intrusion of Space

As much as space is territorialized and boundaries are set, it is always invaded and intruded and hence needs to be defended. Personal space for the individual as well as the national space collectively provides a kind of comfort and any kind of intrusion may raise discomfort (Hall 11, 12). Space has always been a symbol of power and conquering it enhanced the glory of that power. History of any country is mainly stories of invasions and conquests. Norman conquest of England[34] (11th century A.C. E), the Aryan (16th century B.C), the Turks (11th century A.C.E.), the Mughals[35] (16th century A.C. E), etc. in India are just a few of such invasions of space we find in history. Colonialism and imperialism are the results of invaded and occupied politics of space by external powers upon a native space and its inhabitants. Old cities had built strong and high forts which were guarded to prevent the invaders and intruders, remnants of which stand witness even today.

Humans have erected barriers in space restricting the entry of the unauthorized. Intrusion may be into an individual's personal property or to a political state from a different country. Many a battle is fought in history for the conquest of land. Whatever the case may be intrusion is

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[34] Geoff Boxel. *Conquests and Resistance: England 1066-1088.*
<http://www.britannia.com/history/hastings.html>retrieved on14 Jan 2015.
[35] Tim Lambert. *A Brief History of India.* <http://www.localhistories.org/india.html> retrieved on 9 July 2014.

always uncalled for and evokes sharp reactions and punishable in most parts of the world (Hall 10). 'The prohibition on territorial conquest is a cornerstone of the international legal order' (Kontorovich 180). Scientific fictions narrate intrusion by aliens from outer space which remains fiction so far, though the possibility may not be ruled out completely. Explorers may even discover a space in the universe which human beings might invade and establish power over it colonizing the inhabitants if any were to exist.

Commerciality of Space

Commercial activities of goods and services existed perhaps ever since humans began to live on earth. Initially as the barter system existed, materials and services were exchanged with other materials or services developed into long distance trade, exchange for other commodities, etc. Lefebvre argues that when ownership of land and agrarian activities were the source of wealth, trade and trades people were considered as outsiders and space for trade was assigned somewhere outside. This was perhaps in an agrarian society the merchants were outsiders and their activity—selling for profit what is not theirs—like time which belongs to God was criticised (Le Goff 29). But during the sixteenth century there was a spurge of urbanization in many places and 'the medieval revolution brought commerce inside the town and lodged it at the centre of a transformed urban space' (Lefebvre 265). Commodities produced in excess could not be consumed in the same place and hence it needed to be transported and exchanged or sold. Slowly the spaces of commerce with their commodities, accounts, money, etc. started claiming dominance over religious and other spaces as Lefebvre has pointed out: 'Money and commodities were destined to bring with them not only a culture but also a space'(265). This new space seems to be the market place, space of commerce, perhaps one of the most significant meeting places of human beings where exchange of values and power takes place. This trade culture, secular in nature, produced

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secular space that differed from religious places like churches and personal places like rooms or houses, but a space in the centre, especially in urban life accessible to all, well connected and linked as perhaps the culture of space produced more space of its own kind.

Urban commercial spaces started gaining power over the agrarian systems and the towns as the hubs of commerce ruled over the country side with its networks of transportation and communication. Caravan routes in the deserts and sea routes began transporting goods to different places from its origins for exchange. I am inclined to think that transportation and communication revolutions perhaps took place due to the increasing demands from trade and commerce. I base my insight from the historical accounts of Lord Dalhousie, who was Governor General of India. Among the many advantages pointed out by Dalhousie about the railways in South Asia,[36] he stressed the increase in trade between India and Britain. He believed that railways could transport more Indian produce including raw cotton to Britain and more manufactured British goods could be sold in India (Misra 23-57). Thus goods trains and parcel vans seem to have provided a new transit space for commerce. Concepts like 'political economy', 'world trade' etc, seem to have diminished the world into a global village, with the markets, commerce and merchants dominating the sphere of wealth and speedy transportation and communication systems circulating goods and capital.

The Politics of Space

Exploration of space, historical as well as modern is linked with political ambition. What connects politics and space is either political economy or political aspirations of power. Aristotle believed human beings to be political animals with the power of speech and reasoning (Book 1 Part II). In that case all human activities and transactions are political including literature and literary theory. Terry Eagleton in Literary Theory declares that what

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[36]*Minute* by Lord Dalhousie, Governor-General of India to the East India Company, dated 20 April 1853.

he meant by the political is no more than the way we organize our social life together, and the power relations which this involves; and what he has tried to show throughout this book is that the history of modern literary theory is part of the political and ideological history of our epoch (169). He further adds that, 'literature is vitally engaged with the living situations of men and women' (171) and thus the living situation of men and women are undoubtedly political as they are political beings.

Space perhaps is defined, produced and distributed politically in accordance with different political ideologies that hold power in any given period of time. Political power imposes control on the inhabitants through the control of space within its territorial boundaries. This politically controlled space is considered to be a nation state based perhaps on a common religion, language, or a geographical location. One of the major concerns of this political geography or the politics of space seems to be urban planning, its organization and distribution of space conceptualized and implemented under the power of the sovereignty. The rural spaces under the sovereign's rule too are part of political economy and the power influences the type of crops that are cultivated like switching from food crops to cash crops. Any kind of invasion or intrusion generates clashes and disharmony in a political space. Capitalism, socialism or any other system of political economy is perhaps the expression of different ideological approaches to space. Capitalism has created class structure and unequal distribution of space is socially reproduced and thereby there are historical class struggles. Harvey has highlighted historical truth about this struggle as 'the whole history of territorial organisation, colonialism and imperialism, of uneven development, of urban and rural contradictions, as well as of geopolitical conflict testifies to the importance of such struggles within the history of capitalism' (237).

Lefebvre argues that, one of the reasons why capitalism has survived into the twentieth century is because of its flexibility in constructing and reconstructing the relations of space and the global space economy. It is in constituting the world market that the ultimate locus and medium of struggle has a space, and is therefore a crucial political issue. 'There is a politics of space because space is political'.[37] Spatial organization, ordering and reordering seem to influence and change the ways in which a society functions and hence space may be considered potentially political.

Different Spaces

Space cannot be confined to the known and given certainties because space can manifest itself in uncertainties and impossibilities contradicting and contrasting human understandings. That is what M. C. Escher, has proved by creating peculiar types of spaces in his art work with geographical patterns and special illusions which were mathematically impossible by mixing two and three dimensions and making fun of gravity. He questioned irrefutable certainties by asking whether 'floor can be a ceiling too', 'a staircase is for climbing to a higher plane or down', etc. by representing such controversial spaces in his artistic works.[38] His illustrations of such challenging spaces though impossible to construct at the moment may one day be tackled as it is a puzzling task. With his plane drawings he astounded even the Mathematicians of his mastery over understanding of space. It was the visual aspects of space that he distorted to have different effects. Most of his drawings and art works deal with space which is impossible to create and difficult to comprehend. Escher's *Self-Portrait in Spherical Mirror* is a lithograph print which depicts a hand (Escher's own hand) holding a reflective sphere in which he is seated and looking into it as the hand holding the sphere too

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[37] Lefebvre. *Espace et politique*, (qtd.) by Stuart Elden.
[38]Escher's art works may be found in www.escherinhetpaleis.nl/.../eschers-space/.

is reflected in the sphere. The inside-outside notion of space is challenged in this as well as many other images of Escher as interior and exterior are impossible to tell apart.

Cantor Space

In mathematics the Cantor Set is a set of points lying on a single line segment that has a number of remarkable properties and possibilities. If the middle third of a line segment of unit length is removed, two equal segments may remain. By removing the middle thirds of the segments through infinitely many steps, what remains in the end is a remarkable subset of the real numbers called the Cantor set. 'The Cantor set is an instructively simple example of a fractal, demonstrating that our geometrical intuitions about space (even such simple spaces as the unit interval) may draw us, by way of the mathematical imagination, into revelations of deep and even startling structure.'[39] A different two dimensional analogue of the Cantor set is the Sierpinski Carpet or Sierpinski space.[40]A square is divided up into nine smaller squares, and the middle one is removed. The remaining squares are then further divided into nine each and the middle removed for infinite times. A three dimensional analogue of this is called a Menger sponge, another closed set or a different perspective of space.[41]

Minkowski's Space

Notion of three dimensional spaces and flow of time existed until the twentieth century when time and space was thought of as fixed container in which events took place, without any involvement of the container which would remain intact irrespective of the presence or absence of the event. Space and time are no more considered fixed but dynamic, that affects

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[39]Smith, B. Sidney. "Cantor set." *Platonic Realms Interactive Mathematics Encyclopedia.* Platonic Realms, 22 Aug 2013. Web. 22 Aug 2013. <http://platonicrealms.com/>
[40]Helmberg, Gilbert (2007). *Getting Acquainted With Fractals*. Walter de Gruyter. p. 48. ISBN 978-3-11-019092-2.
[30]Ibid.
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the events and the events are affected by time and space. Minkowski presented radical views of space and time that arose from the domain of experimental physics. He says 'from now onwards space by itself and time by itself will recede completely to become mere shadows and only a type of union of the two will still stand independently on its own' (37). The railways compressed space and time through speed and the isolated traveller in the fast moving compartment experienced the feeling of being nowhere and timeless in space and time.

Spatiality of Railway Technology

In the beginning of the chapter I had introduced the notion of the railways transforming the perception of space which had been formulated through centuries. The railways arrived as a transportation technology, a narrative in itself, with a speed which was hitherto unimaginable. 'Annihilation of space and time was the early nineteenth century characterization of the effect of railroad travel' (Schivelbusch 33). The same amount of time permitted one to cover the old spatial distance many times over now and that it meant a shrinking of space according to the transport economy as distances diminished proportionately to the speed of locomotion. The space-time relation perceived by people through their experience of existing modes of transportation was annihilated, not the space itself. Space was altered only as much as for the railways to set its straight path irrespective of the nature of the landscape.

The railways created and claimed numerous spaces like the permanent way,[42] the land reserved for railways along the tracks, railway stations with platforms, waiting rooms and offices, the train itself with its body and the internal carriage space and the vast panorama of landscape viewed from the fleeting trains. This multiple spaces include both mobile and static

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[42] Railway track with its rails, sleepers, fastenings and ballast, called thus to distinguish it from the temporary way laid during the railway construction (Jackson 214).

spaces as railways consist mainly of tracks, stations, and trains (Aguiar 27). The railway space seemed to represent the state with its secular space of colonial power during colonial days and as a space of seemingly national characteristics in the post colonial India. The static space outside the train differed from the static space on the move. The outer spaces seem to be regional and localized with its unique linguistic, social, cultural and communal characteristics that vary from space to space.

Trains are constructed in such a way that there is a clear demarcation between the inner and outer spaces. Once inside the railway compartment the traveller is supposed to be relieved of those outer space characteristics of regional and communal to acquire the aura of rational modernity through the experience of a universal, public railway space, in a vantage position from which to observe through windows, the outside space with its landscapes, buildings, people etc, that appear to move faster than the traveller.

The unique expectation and the vast vistas of exhilarating experiences inside the railway carriage space are represented by Michel de Certeau as the 'perfect actualization of the rational utopia' (111). Certeau calls it a travelling incarceration. The passenger is left with inaction, as neither movement nor conversation is possible. The train moves with immobility inside and outside:

> Immobile inside the train, seeing immobile things slip by. What is happening? Nothing is moving inside or outside the train. The unchanging traveller is pigeonholed, numbered and regulated in the grid of the railway car…The train generalizes Durer's Melancholia, a speculative experience of the world, being outside of these things that stay there, detached and absolute, that leave us without having anything to do with. (111)

What Certeau says emphasises the point that the traveller's link with the outside world is largely restricted. The awareness of the immediate surroundings and locality is annulled in the train set up. The traveller's role is more passive in the machine controlled mechanical setting. A restricted barred and paned view allows only a fleeting glimpse of the static

objects that seem to be moving fast in the opposite direction which causes some sort of detachment. Motion parallax, as it is known is a visual phenomenon in which stationary objects outside a moving vehicle appear to a passenger to be moving backwards. It is a perception of backward motion caused by forward movement. The thin windowpane separates the inside of the train and the outside

> The windowpane is what allows us to *see*, and the rail, what allows us to *move through*. These are two complementary modes of separation. The first creates the spectator's distance: You shall not touch; the more you see, the less you hold – a dispossession of the hand in favour of a greater trajectory for the eye. The second inscribes, indefinitely, the injunction to pass on; it is its order written in a single but endless line: go, leave, this is not your country, and neither is that - an imperative of separation which obliges one to pay for an abstract ocular domination of space by leaving behind any proper place, by losing one's footing. (112)

The rational utopia, the alienation, detachment, musings, isolation, etc. are the subjective experiences and reactions to the new technology experienced subjectively but also in accordance with the classification of the passengers. Only the privileged classes experienced embarrassment in company and loss of conversation across the world as Schivelbusch points out, in the third and fourth classes, there was neither embarrassed silence nor general perusal of reading matter, but merry conversation and ringing laughter emanated from them (76). In the Indian context the railway space was the colonial space that articulated colonial rule and, in which all classes and castes expected to come together discarding their differences. Hence neither silence nor merriment, but more of arguments and altercations prevailed.

It is about this space that Marian Aguair comments: 'Colonial rhetoric presented the railway space as a means of amalgamating different religions and castes into a homogenous nation' (7). All the members of this 'imagined community (Anderson 37) of the supposedly homogenous nation, devoid of religious and caste differences were designated the third class compartment in the train while the spacious first class compartments resembling the Victorian living rooms were reserved for the British. While claiming to demolish the class

and the caste structure, another structure of imperial masters and the native subjects was created. Plenty of space was reserved for the rich masters and too little for the poor natives. In India the natives were assigned the third class without any caste or class distinction. The multi-linguistic, multi-ethnic and multi-religious Indian culture with class and caste differences could never before be placed into these generalisations which the railway or public spaces try to create and thereby attempt to erase the difference.

The 'rational utopia' of the interior space of the trains as Certeau calls it perhaps refers only to the first class compartment in colonial India, because the rest of the classes and the platforms were usually spaces of disorder and chaos. The cultural differences and the concepts of space as constructed and lived were demonstrated in the colonial railway space. This difference was displayed from the manners of the Europeans keeping personal distances and avoiding activities other than reading whereas the Indians cooked, washed, ate and took bath on the available space of the railway premises. The concept of public space was differently perceived by the English people and the natives perhaps due to the differences in their cultural practises. Marian Aguiar details how the English travel writers considered how 'Indians mobbed the stations, talked excessively, brought their pots and pans and turned the secular world of the train into a place for religious rituals' (30). Mandatory ritualistic cleansing, bathing and eating habits of the Indians irrespective of the spaces they were in, was objectionable to the English who had more specifically defined space for different activities. Domestication of the public space of the railways by washing clothes in the pools of rain water, and converting the secular space of the railways for religious rituals like purifications, etc. are enumerated and published by many colonial writers to show how Indians changed the nature of space (Mitchell 21).

Spatial experience of the traveller seems to depend upon transportation technology. Roads so far were embedded on earth adjusting to the contours of the earth and slow animal driven vehicles moved slowly according to the rhythmic natural speed of the animals, very little distanced from the experience of walking. But the railway tracks seem to tear across the earth in an unbending straight line cutting through the terrains and mountains and bridges across the rivers. The smooth running locomotives with speed many times over the previous means of transport gave the impression of flying. Transition from the spatial consciousness of traditional travelling to the new technology driven spatiality, seemed to eliminate all the previous spatial experiences and thus the travellers felt disoriented and disturbed as Charles Dickens narrates in his short story 'A Flight' (143).

Dickens' short story, 'A Flight' is a complete narration of his experience during a train journey from London to Paris in 1851. In a passive state, left with nothing to do as an 'incarcerated passenger,' Dickens' imagination flies wild. Inside the train he is affected by the noise and motion while outside experience as glimpsed through the window is completely disorienting.

> Here we are—no, I mean there we were, for it has darted far into the rear—in Bermondsey where the tanners live. Flash! The distant shipping in the Thames is gone. Whirr! The little streets of new brick and red tile, with here and there a flagstaff growing like a tall weed out of the scarlet beans, and, everywhere, plenty of open sewer and ditch for the promotion of the public health, have been fired off in a volley. Whizz! Dust-heaps, market-gardens, and waste grounds. Rattle! New Cross Station. Shock! There we were at Croydon. Bur-r-r-r! The tunnel. (144)

I think it is important to notice that before he is able to identify a place, he has passed it and entered another space, which seems to be a disorienting experience.

It is a literary image of a traveler's encounter with speed which would have been a lengthy narrative with the minute details of the places if it was a slow journey in a carriage. The space in between the stations have lost their identities as what matters is the stations, as points on

the map, where the trains stop, which differ only in their names. Schivelbusch identifies these intervening spaces in between the points as the 'traditional travelling space' which was destroyed while the 'points moved into each other's vicinity: one might say that they collided' (38).

The traveler is untouched by the space as in a flight and so seemed everything else disappearing in rapid flight as Charles Dickens points out:

> Bang! We have let another Station off, and fly away regardless. Everything is flying. The hop-gardens turn gracefully towards me, presenting regular avenues of hops in rapid flight, then whirl away. So do the pools and rushes, haystacks, sheep, clover in full bloom delicious to the sight and smell, corn-sheaves, cherry-orchards, apple-orchards, reapers, gleaners, hedges, gates, fields that taper off into little angular corners, cottages, gardens, now and then a church. Bang, bang! (144)

In such a spatially disorienting encounter, the travelers as in Ruskin's words are 'human parcels who dispatched themselves to their destination by means of the railway' (166).

The eleven hours travel covering such a vast spatial distance makes Dickens temporally unsettled also as he wonders where England was, and when he was there last which he guesses it to be about two years ago. 'Enchanted' and 'bewitched' are two states he finds himself in as he declares, 'I have over flown myself, perhaps, but I can't believe it. I feel as if I were enchanted or bewitched,' and the condition is not different even after reaching the destinations, as 'I walk up to the Barriere de l'Etoile, sufficiently dazed by my flight to have a pleasant doubt of the reality of everything about me,' and 'I pass to my hotel, enchanted; sup, enchanted; go to bed, enchanted' (1465). Experience of early travelers elsewhere too might have been same, though many could not express it so eloquently. Though the trains did not actually bring the places physically any closer, by enabling speedy access to remote places a new conscience of distances was created.

It is not only the people and places that seemed to lose their identity, but also the products from different places lost their spatial identity. Before modern travel technology arrived,

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goods had a local identity bearing the mark of where they were produced. Faster means of transportation dislocated the goods from their place of production to a market space where the product became a 'commodity' losing some of its original properties and attaining some new contexts. Schivelbusch explains this process as:

> The regions, joined to each other and to the metropolis by the railways, and the goods that are torn out of their local relation by modern transportation, shared the fate of losing their inherited place, their traditional spatial—temporal presence or, as Walter Benjamin sums it up in one word, their 'aura'. (41)

Thus the goods and humans got converted into commodities in the mobile space of the railways, losing their locality, their identity and space. All that can be identified is a starting station and a destination station which is again identical except for their names and the intermediate space does not exist at all as far as the travel is concerned.

Conclusion

I have tried to understand space in its various manifestations and dimensions in this chapter tracing along a few theories of space as well as certain spatial conceptions and perceptions. Space seems to be everything that exists and determines the existence of the beings ordered by the production and reproduction in the system of capitalism. Vastness of space permits no culmination of enquiry and search as it proves to be humanly impossible to observe it in entirety. I have tried to understand space and time independently though they are like two different sides of the same coin.

Time is no more independent of space as time has no relevance without the spatial reference, as Giddens argues "when" was almost universally either connected with "where" or identified by regular natural occurrences (17). A timetable, such as a schedule of the times at which trains run or stop, might seem at first sight to be merely a temporal chart. But actually it is a time-space ordering device, indicating both when and where trains arrive. As such, it

permits the complex coordination of trains and their passengers and freight across large tracts of time-space (20). Time and space were observed as independent entities before Einstein's relativistic physics. Both time and space have lost their separate characteristics and significance, hence the term spacetime as one, was proposed by Albert Einstein in his theory of relativity.